

**UNIVERSITY
of GUELPH**



**Ontario Ministry of Agriculture,
Food and Rural Affairs**

SCIENCE, TECHNOLOGY AND PEOPLE

ANNUAL REPORT FOR FISCAL YEAR 2006/2007

OMAFRA-FUNDED RESEARCH, EDUCATION AND LABORATORY SERVICES PROGRAMS

Integrated Research, Education and Laboratories Programs
Serving Ontario's Agriculture and Food Industries

September 30, 2007

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EXECUTIVE SUMMARY

Background

This Annual Report is being submitted to the Ontario Ministry of Agriculture, Food and Rural Affairs (OMAFRA) in accordance with the terms and commitments under the OMAFRA / University of Guelph Agreement. This is the fifth Annual Report under the current agreement between the University of Guelph (UofG) and OMAFRA, which was signed March 20, 2002. Originally signed as a five year agreement, a one-year extension of the term agreement was mutually agreed to, changing the end date of the current agreement to April 30, 2008.

The period covered by this Annual Report is the University's 2006/2007 fiscal year (May 1, 2006 though April 30, 2007). The report covers the activities, budgets, expenditures and performance measures for each of the four program areas encompassed by the Agreement – **Research, Diploma Education, Veterinary Clinical Education** and **Laboratory Services**.

Summary of Activities and Results

All Performance Measures Agreements (PMAs) of the OMAFRA/U of G Agreement are reported on in much greater detail later in this report. The PMAs were unchanged from the previous year.

Within the Research Program, several transformations in the various research sub-programs continued in accordance with the new directions initiated in the previous couple of years.

Following the initial implementation of the first three projects in the new Bioproducts program in May 2005; two additional Bioproducts projects were approved for commencement in May 2006. A further call for Letters of Intent (LOI) and subsequent request for submission of full proposals within the Bioproducts research program was conducted through the 2006/07 fiscal year.

May 2006 marked the start of the new Sustainable Production Systems (SPS) research program. This program is targeted to production research related to the major livestock and horticultural and field crop sectors (previously encompassed within the Plants and Animals Research Programs). Seven new integrated (multi-disciplinary, “value-added”) research projects were approved to commence in May 2006. Following a further call for LOI for SPS projects, an additional 4 projects were approved to start in May 2007.

The last of the projects operating under the Animals Program came to completion as of April 2007, and thus the remaining operating funding for this program was transferred to the SPS program effective May 1, 2007. All Plants Program projects had ended in April 2006, with the operating funding being moved into the SPS program at that time.

No significant changes occurred in the other three programs --- Resources Management and Environment (RME), Food, and Sustainable Rural Communities (SRC), but a call for proposals and the associated review and approval process was carried out within the RME and SRC programs. All programs, with the exception of SRC, have now been converted to the integrated projects structured around multi-disciplinary teams and clearly identified leverage of funding from sources outside of the OMAFRA/UofG Agreement and integration of scientific capacity from other institutions where needed.

Highlights from all six research programs (Food, RME, SRC, Bioproducts, SPS, and Animals) are provided in the Research Program Overview section of this report.

The number of articles in the popular press, written by researchers, was down from last years numbers. As noted last year, many of these popular press articles are now written by SPARK writers. Committee memberships in 2006/07 returned to the levels approximately equal to those in 2004/05, down from the spike noted last year. The number of presentations at scientific conferences was 564, an increase of 7% from the previous year. Presentations to industry and stakeholder groups increased substantially from the previous year; (see table 1.3.1 for details). However, it should be noted that our reporting of these data is becoming more refined each year.

The SPARK (Students Promoting Awareness of Research Knowledge) program was again a prolific source of 101 articles, an increase of 42% from 2005/06, for a variety of publications, providing profile for U of G research projects in 2006/07. These articles appeared in a number of media, including a variety of commodity organization publications, agri-food sector print publications, syndicated columns, periodicals, and the University's **Research** magazine. Through the agreement with OMAFRA's Town & Country Ontario television, the SPARK students continue to contribute InfoBreaks to that program as well.

OMAFRA/ARIO received \$622,476 in royalties during this past fiscal year. This represents a decrease of 8.6% over the previous years' amount of \$676,129. Royalties from plant cultivars (germplasm) increased year over year while royalties from other forms of intellectual property decreased.

The delivery of Diploma Programs, 2006/07 has again been a year of making further adjustments and fine-tuning of programs following the major changes that have occurred since 2003/04. Enrolments in Diploma Programs at regional campuses decrease slightly in 2006/07, from 861 to 798 or 7.3 % from the previous year. Student graduations, employment statistics and attrition data are detailed in the report (Tables 2.3.2 and 2.3.4). In May 2006, title "campus" was adopted by each of the regional colleges to better reflect their further integration with the UofG.

Total revenues from Continuing Education (CE) Programs at the regional campuses continue to grow, exceeding \$6.3 million in 2006/07.

The Veterinary Clinical Education Program (VCEP) continued to provide support for the Veterinary Teaching Hospital, advanced clinical training, an externship and a 1-year post-graduate Veterinary Internship Program. As well, 24 of the 41 students enrolled in the graduate D.V.Sc. Program were supported by the VCEP Program.

The Laboratory Services Division (LS) continued to provide high-quality testing and diagnostic services to public and private clients in the agriculture, food and veterinary industries. The Animal Health Laboratory (AHL) performed about 662,000 procedures in support of disease surveillance. The Analytical Laboratory performed approximately 929,000 procedures for plants, soil, water and food. As a result of developing new programs to expand on the number of test methods accredited to ISO 17025 standards, 14 new tests were accredited in 2006/07 bringing the total to 163 of new tests accredited to ISO 17025. LS is the first non-government laboratory to become accredited for method development and non routine testing. In 2007, LS responded quickly to public concern and played an important role in the investigation into the international pet food recall crisis. Total revenue from outside the agreement decreased slightly to \$11.9 million from \$12.0 million in 2005/06.

1. Research Program

1.1 Accomplishments in 2006/2007

Management Accomplishments

- Within the Research Program, fiscal 2006/07 was characterized by continuing the transition to integrated, outcomes-based research proposals, as first introduced in the Food and Environment Programs in 2004/05 and continued with the implementation of the Bioproducts Program in 2005/06.
- May 2005 marked the commencement of 7 new projects approved under the **Sustainable Production Systems** research program, following the submission and review of Letters of Intent (LOI) and full proposals through the fall and winter of 2005/06. Extra efforts were undertaken through a variety of means to communicate the changes in program structure and procedures, and the new structure of eligible proposals. A further call for LOI and the associated review and approval process was conducted in fall/winter 2006/07 for additional SPS projects to begin in May 2007. The SPS program is the largest of the OMAFRA/UofG research programs in regard to scope of the research encompassing the entire breadth of production issues across the major livestock (aquaculture, beef, dairy, equine, pork, poultry, sheep) and crops (field and horticultural crops, pest management) sectors and in terms of resource allocations (project operating awards; faculty and technical staff allocations; use of research station resources, etc.) The management group and Research Program Directors (RPDs) worked through several management challenges that this scale and diversity presented and which had not been encountered previously with the Food, Environment, and Bioproducts programs.
- The Plant Research Program was terminated as of April 2006, coinciding with the completion of all but a couple of the Plant Program projects. Many projects within the Animal Program also came to completion in April 2006, although several other ongoing projects in the Animal program continued until April 2007. The 'project operating funds' for the Plant and Animal Programs was transferred into the Bioproducts Program and the Sustainable Production Systems Program.
- In the Bioproducts Research Program, two additional projects were approved for implementation in 2006/07, adding to the three projects that had been approved the previous year in this new Program. A call for LOI/Proposals was undertaken through the fall and winter of 2006/07 for other projects to begin in May 2007.
- No significant changes were undertaken within the **Food and Resources Management and Environment** programs. Within the Food Program, interim reports had been requested from leaders of several of the project leaders, based on insufficient progress being reported in their second annual project reports submitted in January 2006. Following submission of these interim reports in Sept 2006, project management worked with the Food Research Program Director and the project leaders as needed to ensure that projects were progressing as needed and commitment of further resources was warranted.
- A fundamental change within the OMAFRA/UofG Agreement was implemented in May 2005 with the introduction of the Research Station Services and Access (RSSA) Fees that are levied on a per research unit basis, i.e., number of acres used or number of 'animal days' used. The RSSA Fees, which cover all of the direct operating costs of the research stations,

but do not include building or land ownership, maintenance or capital costs (these are still paid for entirely by OMAFRA) are intended to:

- Ensure equitable sharing of the cost of the research stations among all research partners benefiting from their use,
- Improve the sustainability of the research stations over the long term and allow budgets to adapt to inflation,
- Ensure that the cost of operating the research stations will be transparent to all stakeholders,
- Provide a mechanism whereby more OMAFRA program funding is available for investment in project operating awards, yet ensure that combined partner / OMAFRA project operating support levels are maintained and funding partners do not face an undue burden when paying their share of the RSSA fees.

Since relatively few new projects were implemented in fiscal 2005/06, and with the advent of the new projects under the SPS Program, the RSSA fees and management process required a considerable amount of communication among and training of individuals at all levels (researchers, departmental and central admin staff, station managers, etc.) engaged in these projects.

Also, since not all projects needing access to the research stations had received approval for OMAFRA project operating funding, a “tiered access” system was inaugurated to facilitate this access and to maximize the use of the research stations, which are one of the major components making the OMAFRA/UofG Agreement unique. Under this ‘tiered access’ system:

- Tier I projects are those that have undergone the full LOI/full proposal review process and have been approved for an allocation of OMAFRA project operating funds under the Agreement. These projects receive first priority for access to the research stations.
 - Tier II projects are also approved as addressing OMAFRA’s research priorities, but do not have project operating funding awarded through the Agreement. This approval can be by way of the Tier I process, but where operating funds have been insufficient to allocate to the project, or via a separate submission seeking OMAFRA assessment of the project objectives, but no request for operating funds. Tier II projects have next priority access to the research stations; if the station(s) capacity is not fully utilized by approved Tier I projects.
 - Tier III projects are essentially identical to Tier II projects, with the only difference being that the objectives are more ‘public good’ oriented, and use of the research stations in support of these projects is endorsed by OMAFRA. As the terminology suggests, these projects would be undertaken if there is unused station capacity after undertaking current Tier I and Tier II projects.
 - If there is still unutilized capacity at a research station, Tier IV, or proprietary or ‘contract’ research proposals would be entertained.
 - For approved Tier I, II or III research projects, partnering sponsors are expected to pay a proportionate share of the cost of the RSSA fees. Sponsors of Tier IV projects are expected to cover the entire cost of the RSSA fees.
- Another change in 2005/06 was the implementation of indirect costs charges on all research grants as of June 2005, in addition to research contracts, which had been subject to indirect costs charges previously. (Research grants are awarded to faculty members in support of their research interest with no or very little conditions associated with the award; whereas, research contracts normally deal with research which is sponsored by either government or industry requesting specific research and usually entails intellectual properties and special

- reporting under the contractual arrangements). This has resulted in an ongoing need to communicate with researchers and with research sponsors about the changes, and this has been particularly important for researchers and sponsors involved with “OMAFRA projects”, with the coincidental implementation of the RSSA fees, the Tiered project structure and the implementation of new projects under the SPS Program. (for a more detailed description of the indirect costs charges, refer to the 2005/06 Annual Report)
- Following the August 2005 announcement by the Minister of Agriculture, Food and Rural Affairs, ownership of the 3 regional campuses (Alfred, Kemptville, and Ridgetown) and 14 OMAFRA research stations (Alma, Arkell, Bradford, Cedar Springs, Elora, Emo, Guelph, Huron, New Liskeard, Ponsonby, Simcoe, Vineland, Winchester, Woodstock) was transferred from the Ontario Realty Corporation (ORC) to the Agricultural Research Institute of Ontario (effective March 6, 2007). As a result of this transfer, the University undertook oversight of the facility operations and maintenance (O&M) programs for the facilities on these sites, with the \$3.8 million ORC budget for O&M for these properties transferred into the OMAFRA/UofG Agreement effective April 1, 2006. Planning and preparation for the transfer was conducted in cooperation with OMAFRA through the fall and winter of 2005/2006. In April 2006 the University hired Remo Pallottini to be Facilities Manager, ARIO Properties. O&M baseline budgets were calculated (reflecting the ORC O&M budget as well as the many O&M costs that had previously been paid from within the Agreement) and as of April 1, 2006, Managers at each of the ARIO locations have assumed full responsibility for all O&M issues at these locations (for facilities used by the University in delivery of the programs under the Agreement, as well as those occupied by tenants at various sites). As predicted, this consolidation of responsibilities has been very beneficial, resulting in more efficient and effective management of this important component of operations even within the first year, during which time we have also moved a significant way along the learning curve on this aspect of operations.
 - Although not new in 2006/07, the budget for University managed projects funded from the OMAFRA capital program increased to approximately \$3 million from \$1 million in 2005/06 (managed distinct from, but complementary to, the OMAFRA/UofG Agreement). This required a substantial increase in effort by the managers of the 17 ARIO locations, in conjunction with Remo and other central staff, to ensure the planning, implementation and management of the many and varied projects was carried through to completion. This capital funding has been hugely beneficial in addressing many outstanding and deferred maintenance deficiencies at the locations, helping us attain much improved compliance with health and safety, animal care, environmental regulatory requirements, as well as achieve several facility operational efficiencies. The close integration of the management of this capital program along with the O&M and the operation of the Agreement programs has facilitated a much more strategic and efficient resource allocation and utilization system under the Agreement.

Highlights of Research Accomplishments

Several highlights of the past year’s research are listed below under each of the research program areas.

Bioproducts Research Program

The goal of the Bioproducts research program is to facilitate through research and development the transition to a more sustainable economy by replacing petroleum-based resources, which are limited in availability and are a major source of greenhouse gas emissions, threatening our climate and our health, with renewable plant-based resources.

It is supported by the goal to fund bioproducts research that will give Ontario based companies and producers a competitive advantage in global markets and support more environmentally sustainable production systems for improved quality of life for all Ontarians.

Bioproducts as defined for this research program include all chemicals, fibres, and other compounds produced from agricultural-based renewable resources. By choice this does not include biofuels as research in this area has been funded through other programs by OMAFRA.

There are currently four crop based bioproduct research projects being funded with one additional project starting this spring. All projects made significant progress in 2006 and have reached their proposed milestones as originally described. There have been minor shifts in a couple of objectives to account for unanticipated intellectual property issues.

Highlights of the Bioproducts Research Program

- The University of Guelph is delighted to announce that after a comprehensive international search, Dr. Amar Mohanty has been appointed as the Premier's Research Chair in Biomaterials and Transportation. This is one of the Ontario Research Chairs established by the government to strengthen Ontario's economic advantage and create a culture of innovation. Dr Mohanty is internationally recognized as a leader in revolutionizing the use of agricultural and forestry resources in developing novel bioproducts. Dr Mohanty will begin his appointment in the fall 2007.
- A consortium of four major Universities in Ontario (Guelph, Toronto, Waterloo and Windsor) successfully developed and was awarded an Ontario Research Fund grant of \$5.9M for the Ontario BioCar Project. The Ontario BioCar Initiative represents a partnership between the automotive industry and the public sector aimed at accelerating the use of biomass in automotive materials.
- Continued progress was made in the development of a low-cost recombinant antibody production system designed to produce inexpensive therapeutics. During this review period three new fusion proteins were purified from yeast expression cultures, the IgG antibody against Pseudomonas IgG was purified from transgenic tobacco, and the one-step purification process was demonstrated for an anti-picloram fusion protein.
- A detailed economic analysis of the potential use of polypropylene/wheat fibre composite for grape vine stakes has indicated the potential of this technology and is the basis for a business plan for an emerging company in Ontario to serve the NA-wide horticultural market
- The framework technology and the research tools for the production of novel industrial starches using Waxy-based cereal crops have been completed. These tools and the complementary maize hybrids when produced will provide Ontario growers and millers with high-value raw material for the production of novel starches and the replacement of current imports.
- A research network involving the University of Guelph (lead), University of Waterloo and AAFC has been established to create the research team required for the newest bioproduct research project – "Evaluating Proteins from Natural and Transgenic Plant Sources for Manufacturing Industrial Films". This project will develop methods to critically evaluate the usefulness of whole protein extracts, protein fractions or novel plant proteins as use in industrial films in medical and food applications.

Sustainable Production Systems

This is the first report for the new Sustainable Production Systems research program. There are seven broad research priorities being addressed. These are a) Productivity Improvement, b) New Products, c) Agricultural Diseases and Human Health, d) Value Chain Intelligence (Market Research) and Opportunities, e) Production Management for Environmental Stewardship, f) Policy Supporting Agricultural Production Systems, and g) Exploring Frontiers.

In the spring of 2006, 11 new research projects were approved. Two of these projects received Tier I funding which included operating dollars with the remaining nine receiving Tier II funding (no operating). Annual reports were received and approved from all nine research projects. In all cases each project is addressing a number of OMAFRA/OASCC priorities and all UofG faculty in this program are providing significant input to Ministry's research priority setting system. Over 95% of all milestones are on target across all projects.

The system to submit proposals, have them reviewed and approved through the two stage review process was complex and lengthy, but successful. All approved projects are well designed with comprehensive objectives and excellent collaboration.

Faculty found the new system challenging. In particular, the complex and detailed budget template was difficult to work with. This has been addressed and a revised template is now being employed. Further those research projects that did not receive any operating dollars through the partnership found it quite difficult to shore up the gap with external funds and many had to reduce a number of objectives. Three of these former Tier II research programs who applied to the second call for proposals in 2007 were approved and these projects moved to Tier I status this year. This brings the total to 5 Tier I and 6 Tier II research programs currently in SPS-Crops.

All research programs funded made progress in 2006, the first year of these new four-year programs. Each Principal Investigator has reported excellent collaboration among the team members (UofG and external) within their programs and most have identified new external sources of funds to lever the OMAFRA investment. Every program has identified numerous graduate students and post-docs (HQP) who are receiving training through research projects within this program. These HQP are contributing significantly to the SPS research program.

The following highlights are generally preliminary in nature reflecting for all projects the first year of 4-year research programs.

Highlights of the Sustainable Production Systems:

- Glyphosate is the most widely used herbicide in soybean production systems. Through studies conducted in 2006, it has been shown that low soil N levels can differentially affect the control of specific weed species. This may help to explain the phenomena of weed patchiness. This work represents the first report of the physiological basis for decreased glyphosate efficacy in selected weed species under low soil N levels.
- An excellent PCR primer has been developed for anthracnose in dry beans and it is being evaluated under field conditions. The test is quick, accurate and cost effective and could be used at a number of public and private diagnostic labs across Canada.
- It has been shown that liquid cattle manure can be used as the sole fertilizer source for growing container nursery crops. Dogwood, cotoneaster and forsythia grew as well or better with recycled liquid manure than with a proven recirculated liquid nutrient formula or with

- top dressed controlled-release fertilizer.
- Two natural products, antirrhinoside and antirrhidine were identified chemically as early photosynthetic products for the first time and that antirrhinoside was a major transported photoassimilate that accumulated in the developing flowers of snapdragon. The role of these compounds in defense and heat tolerance is being investigated as part of this study.
 - A large number of improved cultivars and germplasm enhancements were released to the industry in 2006/07. This includes 25V151, an early, large and firm fruited strawberry, Vollie and Vitall peaches, Vibrant and Violette European plums, Vampire Japanese plum, GB036101 barley and DH410, SC Starfield, OAC Gretna, OAC Ayton, OAC Carman and OAC Lakeview soybeans.
 - Several projects were completed in support of minor-use registration for field and horticultural crops. This very applied research provides growers with additional pest management tools and in some cases the only tools available.
 - Complex crop rotations with legumes under-seeded have higher net returns and substantially lower greenhouse gas (GHG) emissions when compared to continuous corn. Rotation had a significantly larger effect on the mitigation potential of GHG emissions than tillage. Opportunity costs however underscore the limits to increase the mitigation potential beyond the level of the economic best cropping system.
 - Results from 2006 field studies confirm that threshold dry matter at maturity for grain yield varies among corn hybrids and is lower for newer vs. older hybrids. Threshold dry matter for grain yield is an important component of stress tolerance in corn.
 - A tender x cold resistance grape population was created to verify phenotypically and biochemically the presence/expression of three novel, stress-related genes previously isolated from grapevines by UofG scientists and collaborators on this project. The population was stratified for early spring germination and further testing in 2007. This work should lead to a screening system to quickly identify hardy plants and/or cultivars and thus reduce cold stress losses the industry suffers ultimately increasing the consistency and profitability of the industry.
 - New all-male asparagus hybrids with yield, quality and disease resistance superior to the industry standard, Guelph Millennium have been identified and are moving to the final stages of evaluation prior to release to the industry
 - A disease forecasting program for late blight on celery provided excellent disease control with 2-4 fewer fungicide applications.
 - A new rating system for fusarium in winter wheat that combines plant disease symptoms and grain toxin levels is being developed. This system will provide producers with a rating they can use to assess the risk of loss of crop grade.
 - New foliar and slow release organic fertilizer formulations for high and low maintenance turf were evaluated.
 - A variety of irrigation experiments are underway to investigate methods to conserve water, regulate plant growth and maximize fruit quality and size.
 - Development and availability of a new plant growth bio-regulator (Prohexidione-calcium) registered for use on apples in Canada will provide growers with new methods to regulate vegetative growth as well as fight disease caused by *Erwinia amylovora* (fireblight).
 - New cabbage seed pod weevil resistant canola double haploids have been identified which perform significantly better than susceptible isolines and check varieties.
 - A detailed study of seed coat darkening in over 700 cranberry-type dry beans germplasm and breeding lines provided preliminary evidence of one line with less darkening than all others.
 - Variety registration and crop recommendation trials were successfully conducted across the province in all major field and horticultural crops providing growers with excellent data to make varietal selection choices.

Animal Research Program

This is the last year of the Animal Research Program. The Plant and Animal research programs have now been replaced by the Sustainable Production Systems Program. Below are several highlights from the Animal Program.

Pork Sub-program:

- Candidate genes have been identified that appear linked to the susceptibility of pigs to disease, and respiratory disease in particular. These genes are related to the production of major innate immune lectins in pigs. On-farm studies are now conducted to verify these genetic markers. This research will allow effective selection of pigs for improved disease resistance.
- *Salmonella* infecting bacteriophages (>400 isolates) have been isolated from Ontario pig farms and characterized in terms of host range. Selected cocktails of these bacteriophages can prevent *Salmonella* infections in pigs. This research may yield an effective means to control *salmonella* on pig farms, enhancing the consumer's confidence in safety of pork meat.
- The prevalence of resistance to 15 common antimicrobial was studied in 1322 isolates of non-pathogenic *Escherichia coli* obtained from 90 finisher swine farms. Of these isolates 12.56% were susceptible to all 15 antimicrobials. However, high frequencies of resistance were observed for various antimicrobials (e.g. 78.9 % for tetracycline, 49.9% for sulfisoxazole, and 59.6% for streptomycin. Most of these antimicrobials are members of classes of drugs frequently used in veterinary medicine, and indicate that the effectiveness of these antimicrobials is declining over time and that alternative means to control (pathogenic) microbes should be sought.
- Commercial vaccines against porcine circovirus associated disease (PCVAD) have been evaluated and proven effective. Vaccination appears an effective means to control PCVAD, which caused dramatic increases in pig mortality and financial losses in profitability in the Ontario pork industry.
- The use of injectable hormone like substances, to induce follicle development at weaning and stimulate ovulation 80 h later, results in better conception rates when inseminating sows artificially. This approach improves reproductive performance of sows and reduces labour needs.
- A bacteria that is commonly present in the digestive tract of pigs and humans (*Lactococcus lactis*) has been genetically modified to produce a peptide that stimulates gut development in pigs (epidermal growth factor). This technology represents a novel and effective means to deliver a variety of beneficial peptides to pigs.
- Variability in pork meat quality has been assessed, based on sampling more than 600 pigs from more than 27 different swine operations. Variability has been larger than anticipated, with drip losses exceeding 12% from some of the loin and ham samples. The latter represents a direct loss to the pork industry. The use of genetic markers – to identify pig genotypes that are prone to generate pork with high drip losses – and feeding and animal handling strategies to reduce these drip losses are explored.
- The nutritional value and feeding value of a variety of alternative pig feed ingredients has been explored, reducing the reliance of the Ontario pork industry on corn and reducing feeding costs. When feeding high-fiber containing co-products from the food and bio-fuel industry to pigs diets, the dietary requirements of some essential amino acids are increased, which warrants changes to feed formulation practices.

Poultry Sub-program:

Disease, health, vaccines, diagnosis

- I. Different avenues have been taken to formulate effective vaccines against important poultry diseases:
 - a) Genomic approach to develop of a versatile fowl adenovirus serotype 9 (FAdV-9) vector which can express foreign genes and in turn the expressed immunogenic protein can induce protective immunity in vaccinated chickens for example against avian influenza virus and Newcastle disease
 - b) Proteomic approach to identify key antigens of *Clostridium perfringens* that are associated with immunity to necrotic enteritis in broiler chickens; proteomics would permit a more rational approach to antigen selection for vaccine production which would permit greatly reduced reliance on in-feed anticoccidial use in birds destined for human consumption.
 - c) Model system for assessing efficiency of RNAi expressing vectors against avian influenza virus has been established using different cell lines.
- II. New and improved diagnostic tests for example for Marek's disease have been developed

Physiology, the "normal bird"

Probiotics enhanced antibody-mediated immune responses were demonstrated.

Characterization of the signaling pathways of novel receptors to hypothalamic peptides controlling reproduction in birds, and expression pattern of the prolactin receptor in various tissues during embryogenesis

Establishment of a strain of genetically blind chickens at the University of Guelph; it was found that the absence of retinal stimulation results in advance sexual maturation.

It was shown that dietary thyroxine supplementation can effectively induce moult in turkey breeder hens.

The fatty liver hemorrhagic syndrome (FLHS) susceptible UCD-003 chickens had baseline clotting factor activity similar to normal chickens and were therefore considered to be a suitable model for comparison purposes.

Construction and characterization of the first in vivo conditional expression system for the chicken embryo.

Enhanced processing, value added products

Designer eggs that are enriched in lutein by using flax in the birds' diet have been created.

Evaluating the effect of different processing steps within the poultry carcass dressing operation, in a large Ontario plant, helped identify the most effective intervention steps.

Our proud heritage

Four "heritage lines" of chickens a generous donation from Dr. Shaver are the recent addition to the Poultry Research Station, greatly enhancing the research capabilities at the University in helping to study the effect and influence of the genetic background on the immune response to infectious agents, disease pathogenesis, behaviour etc.

Sheep Sub-program:

This marks the second year that no new projects were funded under the OMAFRA sheep sub-program and the final year that projects were completed. Some sheep research was funded within the Sustainable Production System program as a Tier 1 in the first competition (2006) but none in the second competition (2007). There are several on-going sheep projects that are funded outside the OMAFRA agreement and two of those received access to research animals as approved Tier 2 projects.

The past 5 years of the sheep research program saw a great diversity of projects that continued the work of the Ontario Lamb Improvement Breeding Strategy program of the late 1990's. Significant advances have been made in nutrition, genetics, disease health management and reproduction of the intensively managed, prolific sheep. It is hoped that under the new OMAFRA Agreement, there will again be a strong sheep research program.

Projects that were completed this year include:

- Genetic regulation and programming of the HP-adrenal-immune axis in sheep and its implications for resistance to inflammatory disease: A research group discovered that pregnant ewes are very responsive to inflammatory stress, when exposed to LPS. There may be implications on the fetal lamb's to later respond to stress. They also discovered that there is a population of sheep which have an extreme response but it is not mediated by hepatic gene expression. By examining these different populations of sheep, novel genes may be described that can be used to identify disease resistant sheep.
- Alternatives for parasite control in conventional and organic Ontario sheep production systems: This project examined the in vitro effects of some herbal compounds purported to have anthelmintic effects against a variety of species of gastrointestinal parasites. Four of these compounds, *Azadirachta indica*, *Ilex paraguariensis*, *Cucurbita pepo* and cedar essential oil appear to reduce survivability of L3 larvae. The project also funded part of the first year of a 3 year study into the natural epidemiology of gastrointestinal parasitism on organic and conventional flocks. Loads in adult ewes were highest in the spring and in lambs through the summer and fall. There was tremendous flock-to-flock variation in levels however. Analysis has shown some interesting trends and associations which will be studied in more depth in the 3 year portion of the project.
- Risk of water-borne pathogens from pastured sheep: This project examined the behaviour of grazing sheep when pastured near water and the association between presence of grazing sheep and prevalence of specific pathogens such as *E coli H7:O157*, *Salmonella*, *Listeria* and *Campylobacter* bacteria. Sheep, unlike cattle do not spend much time near water except to drink and prefer to camp away from water if shade is provided. In the 10 flocks studied, very few isolates of the pathogens listed above were found. Based on these study findings, sheep do not pose a significant risk to water quality by normal grazing activity on pasture.
- Freemartins, sex chromosome chimerism and effects on sex determination: This project explored the incidence of sex chimerism in lambs and its effect on reproductive development and fertility. This survey found that in 2 flocks utilizing prolific Rideau sheep, over 5% of ewe lambs born co-twin to ram lambs, had some degree of chimerism. No mixed twins produced a chimera but male: female ratio in triplets and above appears to have no effect on incidence rates. In prolific ewe flocks, chimerism may be a significant source of infertility in ewe-lambs born co-twin to a male.
- Effects of glutamine supplementation during metabolic acidosis on gastrointestinal tract (GIT) protein synthesis, protein degradation and GIT growth. This research team studied the protective effects of glutamine supplementation to prevent the negative impact of acidosis. Lambs are pushed for growth using high carbohydrate diets and there is a detrimental effect

on metabolism and health. Glutamine supplementation is believed to modify those detrimental effects.

Resources Management and Environment (RME) Research Program

In collaboration with OMAFRA and OARC (Ontario Agricultural Research Council), the RME program organized the 'Ontario Agriculture and Environment Research Day' on December 12, 2006. Leaders of currently funded RME projects within the Environmental area presented research results at this event.

The 2006 Food, Agricultural and Resource Economics Research Update Day was held on December 13, 2006 at the Holiday Inn in Guelph, organized jointly by OMAFRA and the University of Guelph's Department of Food, Agricultural and Resource Economics. A major focus of the day was to highlight research which was funded through the RME program. Both events were well attended and received, providing an opportunity for participants to network and liaison with OMAFRA as well as other provincial and federal departments, and also industry groups.

Annual and final reports in the Resources Management and Environment program were reviewed by the OMAFRA research analyst and by the RME Research Program Director. The majority of projects within the Resource Management area, and one project within the Environmental area were completed this year. Some of the research highlights reported are listed below. The six large integrated team environmental projects; initiated in 2004, entered their final year.

As a result of projects in the Resource Management area coming to fruition; two calls for proposals were issued, for projects to commence May 2007, one call focused on previously identified priorities within the Environmental area in January 2007, and the other call focused on Resource Management research priorities in February 2007. Five projects were approved for funding: Manure and Organic Waste Treatment Technologies, Evaluating the Cost Effectiveness of Multiple Best Management Practices in Agricultural Watersheds, Economic Effects of Bioproduct Efforts on Ontario Agriculture, Evaluating the Effects of National and International Agrifood Policies on Canada, Measuring the Competitiveness of the Ontario Pork Sector to Other Canadian Provinces and U.S. States.

Highlights of the Environmental Research

- Manure storages, barnyards, fields to which manure was applied or where animals grazed were all found to be important sources of bacteria that were transported into surface water resources.
- Pathways for microbial transport between sources and water resources included surface flow and tile drains. The drains may also form a source as bacteria can form biofilms on the plastics used in their construction.
- Computer-aided tomography is being used to analyze pathways through the soil. An algorithm has been developed to allow objective discrimination of voids in the images created.
- Liquid manures and biosolids have an important role to play in supplying nutrients to a crop and that pre-tillage is a judicious Best Management Practices (BMP) for soil where immediate preferential flow is a concern (i.e. contamination would occur before a broadcasted material could be incorporated). Solid material applications are not as likely to result in immediate flow to tile and shallow groundwater.
- Re-evaluation of the current P-index and agronomic value of manures is warranted given that

- the availability of manure P appears to be 1.5-2.5 times greater than the value currently assumed in provincial recommendations
- For selected crops (peppers, cucumbers and squash), a preliminary pre-side dress N test (PSNT) value of >25 ppm indicated no yield benefit with additional nitrogen fertilizer applied at the time of split nitrogen application.
 - Overall greenhouse gas (GHG) emissions are higher for the curing phase than the in-vessel phase of liquid swine manure composting. Most GHG emissions occur in the form of CH₄, with N₂O being negligible during liquid storage and <20% of GHG emissions during composting. GHG emissions under composting were approximately 2/3 of those from untreated liquid manure.
 - The calibrated hydrological model SWAT (Soil Water Assessment Tool) and a series of Landsat images have been used to evaluate land-use and crop change over a 5 year period in the Fairchild Creek watershed to improve hydrological simulations over the region. A strong relationship between changes in coverage of the main agricultural crops planted in the basin and streamflow was identified.
 - Analysis of weather and yield data has demonstrated that many horticultural crops, most notably those of the Brassicaceae family, are prone to yield-reducing damage when heat waves occur during critical growth stages.
 - The climate related conditions identified by producers in the Grand River Watershed as most relevant to their operations were the extremes of moisture, temperature and pests. Wet springs and droughts years, particularly in combination with pests such as aphids caused losses.
 - Producers employed a range of adaptations to deal with climate variability and change. Short-term practices include planting delays, switching crops and drawing on crop insurance. Longer term adaptations, such as diversification are affected by markets, economics and government policies.
 - A new pricing method for weather insurance under situations where returns depend not only on the occurrence of the weather event, but also its timing, was developed.
 - Selected watershed models were modified/adapted to address key issues of spring season hydrology, tile drainage simulations, distributed point source modeling, vegetative filter strips in the watershed modeling framework, development of algorithm for the transport of microbes, and development of framework to evaluate economic tradeoff and water quality.
 - Stack testing the exhaust of four commercially available farm-scale dead animal cremation units indicate that the units are potentially a source of harmful air pollutants such as dioxins and furans. Proper secondary burners at high enough temperatures and sufficient retention time are required to reduce many of the contaminants to more acceptable levels.
 - Sulpha-based drugs, which are known to survive the rendering process in animal carcasses, have also demonstrated the ability to survive the composting process in animal carcasses at least at the lab scale. If the finished compost is land applied as a soil amendment, there is a potential for the drug to recycle back into the food chain by grazing or crop uptake.
 - The C content of paper mill biosolids should not be the only basis for calculating the rate of paper mill biosolids application to agricultural land since components other than C content (such as clay, heavy metals, salt and cellulose content etc.) appeared to affect the biodegradability. The bioassay developed in this project may be a potential procedure to be adopted for testing the biodegradability of paper mill biosolids as a component of the guidelines for their application to agricultural land.
 - Mechanical solid/liquid manure separators can serve a valuable function in certain manure handling systems. There is a wide range of performance characteristics, however, and a standard testing and reporting format, such as that developed here, would be an aid in decision making and manure system design.
 - It is possible to recover water of “drinking water” quality from liquid manure using a reverse osmosis unit. The pigs in the study performed just as well as those on tap water.

- Anaerobic digestion is a feasible method of treating liquid livestock manure. Whether the system will eventually pay for itself is highly dependent on the selling price of electricity. However; how to use the excess heat, the value of odour control and pathogen destruction must be considered.

Highlights of the Agricultural Economics Research

- There is tremendous variability in profitability of swine farms, and farm size is not a good indicator of profitability. On a profit/pig basis, large farms do not necessarily make any more money than small ones. Rather, more important criteria in determining farm profits appear to be productivity and ability to control one's costs.
- There is a negative correlation between hog producer and packer profitability. When producer margins are positive packer ones are not and vice versa. Producer margins tend to be more variable (large year to year swings) whereas processors margins vary in a much tighter regime.
- While many hog farms have expanded in size and improved on-farm productivity (i.e. lower mortality rates) the majority of farms (i.e. 48.7%) have sales less than \$250,000 and control less than 8.5% of the swine inventory. Approximately 12.7% of Ontario's swine farms have sales over \$1 million and control 63.4% of the inventory.
- The setting of an environmental health objective, such as sediment abatement, needs to consider the marginal abatement costs. The incremental marginal cost for a 40% to 50% sediment abatement goal is about 5 times that for an increase in sediment reduction from 30% to 40%.
- The design of an incentive payment scheme for buffer strips should consider that the land retired by such riparian buffers represents a small portion of total land farmed by most individuals. Thus, the estimation of forgone cropping returns from land retirement with the inclusion of fixed machinery costs underestimates the payment necessary to induce farmer participation in conservation program involving the establishment of buffer strips.
- Canadian agriculture is likely to contribute significantly to net emission reductions by voluntarily sequestering carbon due to the adoption of zero till in the last decade and possibly by cutting fertilizer levels in the next decade. The contribution will be mainly as a response to meeting personal economic objectives rather than being induced by direct incentives through the offset program.
- The lack of a pollution haven effect found in the Ontario livestock sector could be due to the limited geographical area of analysis. There are limitations to spatial movement due to adjustment and moving costs from a farm's current location. If the farm is considering a significant expansion or the environmental constraints are binding, these adjustment costs may be outweighed by the advantages of a move to a region with less restrictive environmental regulations. The shift has been noted in our studies for the US livestock sector where inventories have moved to regions with both processing facilities and low population density.

Food Research Program

The integrated food/nutrition program has completed its 3rd year. The program consists of a number of multidisciplinary projects involving collaborations between University of Guelph faculty in six departments, six other Canadian universities and four international collaborations with UK and USA. The food research was conducted mainly at the U of G's Guelph campus, and the U of G's Laboratory Services and the Guelph Food Technology Centre provided research services to industry. The program is based on three research priorities: Food, Nutrition and Health; Food Safety, Traceability and Assurance; and Food Quality. Seven projects were approved in 2004 and this has been the 3rd year for reporting. Overall, attainment of milestones

was satisfactory; however some projects are still slightly behind schedule as a result of the initial rush to set up the projects in 2004. The reports of all projects were reviewed by the Director of the Food Research Program and by an OMAFRA analyst and were generally found satisfactory; in 2 cases discussions were held with the project PI to clarify some aspects of the research. All projects were recommended for funding into their fourth and final year.

One conventional project in the Food program (the last in the series) was completed in the course of the year.

Significant research outcomes are highlighted below

- The immunomodulatory effect of egg yolk digests has been studied using a *Salmonella* infectious model with chickens and it was established that feeding egg yolk digests greatly improved morbidity of chickens after *Salmonella* infection. This first study clearly demonstrated that egg yolk peptides possess a novel immunomodulatory factor and can prevent pathogenic infection in birds. This is the first finding of this type. The study identified the granule component, high-density lipoproteins (HDL) as the protective fraction from egg yolk against food borne pathogens. This original discovery demonstrated the importance of factors in egg yolk for the prevention of bacterial adhesion to the gut surface by enhancing mucosal immune responses and this might play an important role in preventing the pathogenic infection.
- Fibre fortification of foods is important but not always easy to achieve. A study has been completed on the structure and properties of flaxseed gum, a fibre source easily extracted from hulls. Some varieties of flax produce low viscosity gums and these low viscosity fractions of the gum may be very suitable for fortification purposes in foods. Studies of the effects of processing conditions have shown how gum structure may be manipulated to modify food characteristics. A sensory evaluation of fibre-fortified beverages has been made, which provides a thorough map of the flavour, texture, aroma and aftertaste variables that can be affected by fibre fortification and provides direction as to how to formulate acceptable fibre-fortified products.
- A study has been completed on the interactions of fibre with other food constituents, to develop an understanding of how fibre fortification can affect the structures of processed foods. These interactions can be used to advantage to create novel food structures, for example colloidal particles, or act as carrier particles for micronutrient or nutraceutical compounds. An example of this is the exopolysaccharide (EPS) production from lactic acid bacteria (LAB), which are fibre molecules produced *in situ* during fermentation of dairy products. The interaction of these EPS gums with milk proteins is a decisive controlling factor in the texture produced by EPS in dairy products. Manipulation of variables affecting EPS production will give guidance as to how to utilize LAB for fibre production. Similar work with flax and soy soluble polysaccharide gums in dairy products allows selection of the most applicable gums, formulations and processing methods to the development of fibre-fortified products with sufficient fibre content for health benefits.
- Studies continue on the improvement of the health attributes of the fats and oils we consume by means of physical structuring of liquid oils. Significant advances have been made in three areas: (a) the discovery of a new, food grade molecule that causes edible oil to form gels; (b) the determination of the effects of processing conditions on the manufacture of monoglyceride-oil-water gels; and (c) the enzymatic interesterification of stearin-high oleic oil blends. An in-depth understanding of the physical chemistry of hydroxystearic acid organogels has been developed, and use of this knowledge, has allowed the identification of a milk-derived polar lipid that gels oils and has positive health effects on the colon epithelium.

This discovery will be disclosed to the University of Guelph BDO in the next months for patenting.

- Monoglyceride gels are a possible solution to the problem of removing trans fatty acids from bakery shortenings. The effects of processing conditions on the manufacture of these gels and their uses are being defined. For the first time, it has been shown to be possible to carry out chemical and enzymatic interesterification of high stearic acid - vegetable oil mixtures. These mixtures behave similarly to traditional shortenings and margarines, but contain saturated fatty acids that are preferable to trans fats in regard to cardiovascular health. This product could potentially be patentable as well.
- Isoflavone in soybeans has been identified as a potentially beneficial component for human health. Agronomic evaluation of three different soybean varieties (with low, intermediate and high contents of isoflavone) have been completed and are contributing to a growing database that will ultimately be used in the release of the isoflavone varieties to seed companies interested in soybeans with nutraceutical benefits.
- The soybeans have been processed to soy flour and soy protein isolate to serve as ingredients in the functional food. Analytical results were generated for the isoflavone content of the soybeans, soy flour and soy protein isolate. The functional food (bread) has been fully developed. These steps involved key collaborations with industrial partners who are potential end-users of the research findings (i.e., to produce commercially breads containing isoflavones). Economic experiments have also been completed including consumer surveys and focus groups. These studies have generated data relevant to understanding the incorporation of this unique functional food into the marketplace.
- In a study of the effects of breads on markers for diabetes and cardiovascular disease, again with the help of the baking industry, it has been demonstrated that no aspects of the digestion and assimilation of breads that can be interpreted as “unhealthy” or which place a middle-aged overweight person at risk for diabetes or cardiovascular disease.
- It has also been determined that there is a significant effect of bread type on the response in blood sugar and insulin. The best type was found to be sourdough, which appeared to have an effect which not only appeared after consumption of the bread, but persisted for some time and even influenced the metabolic responses to subsequent meals. It is possible that the influence of sourdough may be further enhanced by combining it with whole grains.
- Resistant starch products from different sources (corn, potatoes) have been shown to have effects on the concentrations of carcinogenic compounds in the gut; the effect depends on the type of starch used, with retrograded high-amylose corn starch (RCS) being the most effective in reducing the concentrations of carcinogens. Additional effects were noted for RCS, which suggest it may be beneficial in reducing colo-rectal cancers and systemic bowel inflammations. The beneficial effects of the different starches appear to be correlated with some of their physical properties, which could potentially be used to predict the effectiveness of different preparations.
- Some soluble fibres (guar gum, not produced in Ontario) have been shown to be highly effective in reducing blood cholesterol levels, especially the LDL fraction (“bad cholesterol”). A substitute material suitable for production in Ontario is sought. The resistant starches show some possibility for use in this respect, since they appear to lower blood cholesterol; this may be compared with a fibre such as cellulose that has no effect.
- It is difficult to use simple analytical tests to assay food allergies, and biological or other testing may need to be done to study the allergenicity of foods. A particular strain of mouse has been shown to be a valid model for the study of peanut allergy. However, it has been defined that the activity of a large number of genes is affected by allergens, of which some may show promise as biomarkers for the presence of specific allergens. Similarly, a number of blood plasma proteins has been shown to be over expressed in the presence of allergens, and they also can be used as biomarkers for specific allergens. This work is leading to the

- possibility that the allergenicity of different foods can be tested using *in vivo* to give a reliable estimate of the content of allergens in a particular food or group of foods.
- A study is in progress on the attitudes of consumers to processed foods. This is allowing a detailed picture to be developed on how Canadians perceive novel and/or processed foods. It is becoming clear that there is concern among consumers on the perceived “naturalness” of a processed product. This gives rise to the possibility that foods derived from some technologies may be avoided by the consumer. This is especially true when no great benefit to the consumer is perceived to arise from the uses of new materials or technologies. On the other hand, some established technologies can be seen to be more beneficial and risk-free. Although the study is ongoing, it highlights the need for government and agribusiness to define strategies for successful innovation and commercialization.

Advanced Foods and Materials Network (AFMNet) continue to address three strategic research themes: (1) Structure-Dynamics-Function of Foods and Bio-materials; (2) Functional Foods and Nutraceuticals; and (3) Genetic, Ethic, Economics, Environment, Law and Society. AFMNet will host their 3rd Annual Scientific Conference in Quebec City, Quebec in early June 2007. This NCE project is closely linked to the New Integrated Food Research Program with many researchers from the University of Guelph’s Food program continuing to work closely with AFMNet investigators.

Sustainable Rural Communities (SRC) Research Program

The 2006/07 research year saw the successful completion of a number of projects and the initiation of 6 new ones. The Sustainable Rural Communities (SRC) program along with all OMAFRA/University Research programs was extended for one year providing the opportunity for the potential extension of existing projects and the funding of new projects. New research projects were initiated in accordance with the research agenda set by the Ontario Rural Research and Services Committee (ORRSC). Research Priorities included:

- Communities and Environmental Sustainability
- Labour Force Development
- Rural Immigration
- Rural Poverty

Existing projects which came to a conclusion in 2007 covered a diversity of themes including the needs of the socially marginalized, labour shortages, environmental regulations, value-added business related to the horticultural industry, local food systems, settlement patterns related to immigration and farm viability under the Greenbelt Act. Each of these projects of course had a central focus related to the needs of rural residents, rural communities and rural municipalities.

The research approved in 2007 initiated new projects that include new work in the area of local food systems, transportation in Northern Ontario, the role of government in alleviating rural poverty, the bio-economy and related opportunities in rural Ontario, opportunities for new immigrant farmers and the identification of best practices for environmental planning.

The completed research and new research was in direct response to the research priorities developed through the OMAFRA consultation process. There are certain themes that can be summarized from this research that speak to the continued evolution of economic, social and environmental issues within rural Ontario. Local food and related economic, social, health and environmental benefits is an important research topic which has captured the attention of popular

media and the general public. Related opportunities for immigrant farmers speak to diversification and employment potential in near-urban communities. The role of provincial legislation, such as the Greenbelt Act and Places to Grow in shaping both rural and urban communities have and will continue to play a role in a number of research projects.

The Sustainable Rural Communities (SRC) Research Program benefits from the partnership between OMAFRA staff and priority setting, the faculty and student resources of the University of Guelph, and the partnerships that this encourages. The relevance of the research is ensured through the priorities set by OMAFRA and the diversity of individuals who participate in the review of new research projects.

Table 1.1.1: Research Projects Conducted in 2006/2007 and Approved for 2007/2008

	2006/2007		2007/2008		
Programs	# Projects Active ⁽¹⁾	# Projects Completed	# Proposals Received	# Proposals Approved	# Projects Active
Animals ⁽²⁾	96	96	0	0	0
Plants ⁽²⁾	0 ⁽⁴⁾	0	0	0	0
Sustainable Production Systems	22 (incl. 7 Tier I, * 13 Tier II, 2 Plant Transfers)	0	18 (incl. 6 LOIs; 12 Tier II Submissions)	15 (3 Tier I; 12 tier II)	37 (10 Tier I; 25 Tier II; 2 Plant Transfers)
Resource Management and Environment	11 ⁽³⁾	5	9	5	11
Food ⁽²⁾	8	1	0	0	7
Sustainable Rural Communities	6	5	11	6	7
Bioproducts	4	0	4 LOIs	1	5
Total	147	107	42	27	67

⁽¹⁾ 'Active' refers to all projects being funded in the specified year and includes new projects (started in that fiscal year) as well as continuing projects (initiated in previous fiscal years).

⁽²⁾ No Call for Proposals in Animal, or Food Programs, therefore accounting for lower number of active projects.

⁽³⁾ Total includes a project granted a one year extension to complete the project but with no OMAFRA funding

⁽⁴⁾ Plant program ended April 30, 2006. Two continuing plant projects transferred to SP2 Research Program.

* The 13 active Tier II projects in the Sustainable Production Systems Program are a compilation of 11 projects initially submitted for Tier I consideration and accepted as Tier II projects, plus 2 additional Tier II projects submitted and accepted in August 2006.

1.2 Research Program Performance Measures

Table 1.2.1: This Table lists the Performance Measures in the order shown in the Agreement and the results. The general areas addressed and the specific outcomes expected are described in the 'Objective' and 'Measure/Activity' columns (slightly abbreviated versions on the full wording in the Agreement).

Objective	Measure/Activity	Result
1, A,B,C Priorities	OMAFRA-identified Research Priorities are met.	Research Program priorities were met. The balance of the 96 research projects in the Animal program were completed in April 2007. The operating funding for the Animal and Plant Programs will now be transferred to the Sustainable Production Systems (SPS) Research Program effective May 2007. Throughout the 2006/07 fiscal year Calls for LOIs and subsequent requests for full proposals were conducted for the SPS, Bioproducts, SRC and RME Research Programs.
2, A,B,C Reporting	Delivery on time and within budget A and B. 95% of projects completed on time and within budget. C. Meet 90% of milestones for projects in progress.	A and B. A total of 145 Reports for projects were submitted, of which 94% were on time; however, 83% were within budget. Some of these projects were balanced shortly after the deadline. Arrangements have been made to bring all completed projects to a zero overspent balance (by transferring expenses to related trust fund research revenues) C. 95% of milestones for projects still in progress were met.
3 Animal Care Standards	Meet or exceed Animals for Research Act and Canadian Council on Animal Care Standards	The OMAFRA Minor Capital program provided approximately \$3.2 million in 2006/07. This funding was spread across all OMAFRA stations and regional campuses in support of 92 projects to address priority animal care, health and safety, code compliance and some critical equipment deficiencies. In May 2006, the Canada Committee on Animal Care conducted their site visit at the Guelph campus and the Guelph area animal facilities – Alma (aquaculture), Elora (beef, dairy), Ponsonby (sheep, dairy, general facility, dog unit) and Arkell (swine, poultry, equine). The CCAC report and recommendations from the site visit have been shared with OMAFRA, and the University has outlined our response to their recommendations (also shared with OMAFRA). The newly completed beef research facility at Elora and the renovated dairy barn at Elora were both commended by the CCAC, although they continue to stipulate that plans be developed to replace the dairy facility within the next few years. The investments in facility upgrades through the OMAFRA minor capital program over the past 2-3 years have made significant progress towards addressing animal care issues that could have promulgated recommendations about serious deficiencies from the CCAC and provincial inspector for the Animals for Research Act.

Objective	Measure/Activity	Result																																																																	
3 Animal Care Standards (continued)	Meet or exceed Animals for Research Act and Canadian Council on Animal Care Standards (con't)	The CCAC conducted their site visits at the Ridgetown Campus on April 19, 2007, and at the New Liskeard Agricultural Research Station on April 26, 2007. The Assessment reports for these site visits, and the University's response will be shared with the Ministry when available. CCAC site visits to the Alfred and Kemptville Regional Campuses are scheduled for fall 2007. Reports from the UofG Animal Care Committee site visits, conducted twice yearly at each location, are distributed to OMAFRA on a regular basis, as are the facility management responses. Similarly, the reports of the provincial Animals for Research Act inspector are also distributed to OMAFRA on a timely basis.																																																																	
4, A,B,C Funding from non-OMAFRA Sources	A. Annually increase funding from non-OMAFRA sources for research related to the OMAFRA Agreement.	<u>UofG Research Funding Outside of the OMAFRA/UofG Agreement:</u> <table><tr><th colspan="2">Fiscal Year</th><th colspan="3">A: Total All Portion of Total (A) related to OMAFRA Agreement Research (Note #1)</th></tr><tr><th></th><th>Research</th><th>B: All Sources (Note #2)</th><th>C: Excluding other OMAFRA funding (Note #3)</th><th>D: Excluding all other Provincial Gov't funding (Note #3)</th></tr><tr><td colspan="5">(\$millions)</td></tr><tr><td>2006/07</td><td>92.7</td><td>63.6</td><td>62.0</td><td>48.6</td></tr><tr><td>2005/06:</td><td>110.9</td><td>66.9</td><td>61.9</td><td>36.0</td></tr><tr><td>2004/05</td><td>90.9</td><td>58.0</td><td>55.7</td><td>41.9</td></tr><tr><td>2003/04:</td><td>86.0</td><td>54.7</td><td>52.5</td><td>36.0</td></tr><tr><td>2002/03:</td><td>69.5</td><td>42.7</td><td>40.3</td><td>29.1</td></tr><tr><td>2001/02:</td><td>69.2</td><td>38.5</td><td>36.3</td><td>25.3</td></tr><tr><td>2000/01:</td><td>61.5</td><td>35.3</td><td>33.6</td><td>23.6</td></tr><tr><td>1999/00:</td><td>52.0</td><td>36.8</td><td>35.2</td><td>26.4</td></tr><tr><td>1998/99:</td><td>38.0</td><td>23.8</td><td>22.8</td><td>22.5</td></tr><tr><td>1997/98</td><td>40.8</td><td>NA</td><td></td><td></td></tr></table> Note #1: Estimated based on a review of all funded research projects and a determination for each whether or not each individual project relates to research supported under the OMAFRA/UofG Agreement. Note #2: Includes research funding from all sources (Tri-councils and other Federal government funding; Provincial and Municipal governments; business and industry, non-profit and charitable organizations and private donors), but excluding any OMAFRA/UofG Agreement funding. Note #3: Based on Column B, but excluding all OMAFRA funding (Column C) and all Provincial Government Funding (Column D), without determining whether the OMAFRA or Provincial government funding was actually included in the Column B estimate. Details of the University's research funding are found at www.uoguelph.ca/research/summaries. Non-OMAFRA funding for research related to the OMAFRA/U of G Agreement remained stable at \$62 million but funding from all other sources other than the Provincial Government increased by 35% to \$48.6 million.	Fiscal Year		A: Total All Portion of Total (A) related to OMAFRA Agreement Research (Note #1)				Research	B: All Sources (Note #2)	C: Excluding other OMAFRA funding (Note #3)	D: Excluding all other Provincial Gov't funding (Note #3)	(\$millions)					2006/07	92.7	63.6	62.0	48.6	2005/06:	110.9	66.9	61.9	36.0	2004/05	90.9	58.0	55.7	41.9	2003/04:	86.0	54.7	52.5	36.0	2002/03:	69.5	42.7	40.3	29.1	2001/02:	69.2	38.5	36.3	25.3	2000/01:	61.5	35.3	33.6	23.6	1999/00:	52.0	36.8	35.2	26.4	1998/99:	38.0	23.8	22.8	22.5	1997/98	40.8	NA		
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1997/98	40.8	NA																																																																	

Objective	Measure/Activity	Result																		
4, A,B,C Funding from non-OMAFRA Sources (continued)	B. Annually increase research funding from business and industry sources. C. Report non-OMAFRA funding for infrastructure	B: Business and industry support remained consistent from the previous fiscal year. <table><tr><td>2006/2007</td><td>\$14.9 million</td></tr><tr><td>2005/2006</td><td>14.9</td></tr><tr><td>2004/2005</td><td>14.4</td></tr><tr><td>2003/2004</td><td>16.1</td></tr><tr><td>2002/2003:</td><td>16.4</td></tr><tr><td>2001/2002:</td><td>16.4</td></tr><tr><td>2000/2001:</td><td>15.4</td></tr><tr><td>1999/2000:</td><td>12.2</td></tr><tr><td>1998/1999:</td><td>12.0</td></tr></table> C: Awards were received in 2006/07 for \$4.27 million in non-OMAFRA funding for research infrastructure related to the OMAFRA Research Program objectives. These awards were combined CFI (Canadian Foundation for Innovation), OIT (Ontario Innovation Trust) awards and matching contributions. Refer to page 81 for details.	2006/2007	\$14.9 million	2005/2006	14.9	2004/2005	14.4	2003/2004	16.1	2002/2003:	16.4	2001/2002:	16.4	2000/2001:	15.4	1999/2000:	12.2	1998/1999:	12.0
2006/2007	\$14.9 million																			
2005/2006	14.9																			
2004/2005	14.4																			
2003/2004	16.1																			
2002/2003:	16.4																			
2001/2002:	16.4																			
2000/2001:	15.4																			
1999/2000:	12.2																			
1998/1999:	12.0																			
5 Intellectual Properties	Annually increase the number of licenses, patents and royalties.	In 2006/07, there were 279 germplasm disclosures (new cultivars, hybrids or non-seed propagules) comprised of 1 wheat, 8 barley, 16 bean, 44 soybean, 38 tomatoes, 13 strawberries and 159 canola varieties. In 2005/06 there were 126 germplasm disclosures (1 oat, 2 barley, 5 wheat, 23 maize, 34 soybean and 61 tomato varieties). Nine non-germplasm disclosures made in 2006 (compared to 11 in the previous year) were related to OMAFRA funding. These included bulls bred for tenderness (3) sold for stud (royalties to be paid on semen), encapsulation technology to reduce lipid oxidation (1) and the rest were immunology and disease markers or vaccine candidates. As of year-end 2005/06, there were 43 OMAFRA-Program related patents held by the University. Of the 43 OMAFRA-related patents, a total of 18 have been licensed. In the year ended March 31, 2006, there were 32 new exclusive and 3 new non-exclusive germplasm licenses signed. For the same period, there were 2 new non-germplasm licenses (2 exclusive; 0 non-exclusive) signed. Further details can be found in the Intellectual Properties section beginning on page 82.																		

Objective	Measure/Activity	Result
6 Royalties	Increased combined seed and technology royalties by an average of 5% per annum over the 5-year term of the Agreement.	Germplasm royalty income was \$622,476 during 2006/07 fiscal year. This represents a decrease of 8.6% over the previous years' amount of \$676,129. This decrease stems from private sector partners who are now expected to support breeding programs and as a result are recouping their investments with additional rights or lower license fees. Germplasm royalties were collected on 171 plant cultivars in 2006/07 (compared to 137 in 2005/06) – distribution being 35.1% soybeans, 11.1% cereals, 24.0% maize and approximately 4.25% each on white beans, forages, canola, apple rootstocks, strawberries, asparagus and tree fruits. Royalties; in the amount of \$235,603, were received on 10 non-germplasm technologies.
7, A,B Reporting	A. Submit 4-year program reports at appropriate time and submit changes to research programs by Feb. 15 of each year. B. Report to OMAFRA by Feb 15 on 95% of OMAFRA projects in their final year. C. Annual summary reports to be submitted to OMAFRA by Feb. 15 on each project completed or in progress, in a form which can be readily communicated to the public	A. In 2004/05 an extension was granted for the Animal Program, with some projects being accepted or extended for either 1 or 2 years duration. All projects under the Animal Program Report will be completed as of April 2007. The Plants Program ended in April 2006. In discussions with OMAFRA in fall/winter 2006/2007, it was agreed that the University focus resources on the study to be commissioned on the 10-year impact of the OMAFRA / UofG Agreement, since this will study encompass many of the advances that have been achieved within the Animal and Plant Programs, as well as other Programs under the Agreement. B: The target of reporting to OMAFRA by Feb. 15 on 95% of the OMAFRA projects in their final year was met. 53 annual reports were submitted of which 82% were received by Feb 15th. C: All annual and final project reports received were submitted to OMAFRA in time for preparation for the Research Review Committees' meetings, the majority of which occurred in February. Researchers are asked to provide, in a form free of non-disclosed information, a summary of results and progress against milestones, and in addition in the case of final reports, their conclusions and the significance of the research to the Ontario agri-food sector.
8 Scientific Productivity	Maintain or increase the annual number of: A: Peer-reviewed journal publications (Target: >300) B: Presentations at scientific conferences (Target: >400)	There were 332 peer-reviewed journal publications reported, compared to 373 in the previous year. In addition, there were 102 books or chapters in books published, compared to 392 in 2005/06. Values reported are for publications dated in the calendar year, so the 2006/07 report is for publications in 2006. The total number of presentations at scientific conferences reported was 871, compared to 811 in the previous year.

Objective	Measure/Activity	Result
9 Communication of results to stakeholder or industry audience	Maintain 2003/04 levels for the combined total number of: A. Presentations in the media B. On the internet C. At stakeholder or industry meetings	A: 121 articles in the popular press, compared to 179 a year ago. Many of the popular press articles are now written by SPARK writers after interviewing faculty, so the faculty are not the authors (see Media section). B: There were 3 new presentations on the internet reported by faculty in their research reports. Almost all the faculty involved in the Agreement have their own web pages. The total is >300. C: There were 564 presentations to stakeholder or industry meetings, tours, etc., compared to 411 reported in 2005/06. Our reporting of these data is becoming more refined on a yearly basis.
10 Expert Contribution	Maintain the number of committee commitments year to year	There were 317 memberships on provincial, national and international committees reported for 2006/07, compared to 678 (some duplication was reported) reported for the previous year. Our reporting of these data is becoming more refined on a yearly basis.
11 OASIS Database	Complete a thorough review of research database needs	During 2004/05, the UofG initiated a plan for a new, comprehensive database to support the OMAFRA Research program, which will ultimately allow the University to replace the OASIS database which is outdated and housed on unsupported software. The planned database will also support data collection and management for other research funding and program/animal care training and protocol tracking capabilities and will be constructed on a web-based interface which will streamline project entry, updating and reporting procedures by researchers. Initial development work on this database was undertaken in 2004/05. In fall 2006, the AVP Research commissioned a 'needs assessment review' which was completed in spring 2007. The recommendations of this review will receive some priority action following the arrival of the new Assoc. VP Research in early summer 2007.
12 Impact	Identify a method of measuring impact and submit to the Executive Committee	This PMA was addressed in year one of the current 5-year agreement, through the provision of a 'research impact analysis' study that demonstrated the typical methodology of such studies (as reported on in the 2002/03 Annual report). OMAFRA has since expressed their interest in exploring a separate evaluation of the impact of the research undertaken through the OMAFRA / U of G Agreement. Some specific examples of research with significant impact are provided in the Highlights of Research Accomplishments in this Annual Report.

2. EDUCATION PROGRAM

2.1 Diploma Education

Alfred Campus, Guelph Campus, Kemptville Campus, and Ridgetown Campus

2.1.1 Overview

The educational programs offered through the Agreement between the Ontario Ministry of Agriculture, Food and Rural Affairs and the University of Guelph are diverse in format, targeted in direction and rich in quality and substance. They include 2 or 3 year diploma programs, one-year certificates, apprenticeships and single or multi-day training opportunities and are delivered across the province in both official languages.

In May 2006, the three regional campuses celebrated a name change to better reflect their further integration with the University of Guelph. The new names of the three regional campuses are: Alfred Campus, Kemptville Campus and Ridgetown Campus.

In 2006/07, enrolment in the diploma programs decreased slightly (-7%) over all of the programs except at Guelph.

Overall attrition rates were slightly less than the average of the previous 4 years. Similarly, first and second year attrition rates for year 1 and year 2 remained below 4 year averages. Employment statistics of graduates remain very strong with most programs reporting 90% placement or better shortly after graduation.

External support for the OMAFRA-funded diploma programs remains strong. The OAC diploma alumni announced the launch of a \$1.25 million fundraising campaign to support diploma education at the four campuses. The value of student awards/student increased by 7% this year.

Diploma education continues to be a top priority at Ridgetown Campus. In 2006/07, Ridgetown celebrated the opening of the Rudy H. Brown Rural Development Centre. The new Centre provides tremendous support to all diploma program initiatives at Ridgetown. On June 1, 2007, the campus also celebrated its second largest graduation in history with 181 diploma and certificate graduates.

The Food Nutrition and Risk management programs at the Kemptville and Alfred Campuses received full accreditation for the next five years by the Canadian Society of Nutrition Management.

The Guelph Campus offers only the Associate Diploma in Turfgrass Management. This two year program; introduced in 2003, was developed in consultation with University of Guelph faculty associated with the Guelph Turfgrass Institute, representatives of various associations within the Ontario turfgrass industry and former Associate Diploma in Horticulture alumni working in the turfgrass industry. In a 2007 survey conducted by the University of Central Florida for a U.S.

trade journal, the Associate Diploma in Turfgrass Management at the UofG was ranked 2nd among North American two-year turfgrass diploma programs.

The Ridgetown campus welcomed their first Bachelor of BioResource Management (BBRM) degree students in 2006/07. These students will be specializing in Environmental Management. The Kemptville campus will officially launch its BBRM program in Equine Management beginning in September 2007.

All regional campuses reported significant Business Development & Training activities. The total training effort, which represents more than 50,000 student days, is equivalent to 426 diploma students. All of these programs are very targeted in nature and include specialized certificates, apprenticeship programs and provincially or federally mandated training programs. These activities provide significant leverage for the OMAFRA/UofG Agreement to broaden the reach of these programs.

2.1.2 New Initiatives

Campus d'Alfred

1. Accreditation

The Food, Nutrition and Risk Management (FNRM) program received full accreditation for the next five years by the Canadian Society of Nutrition Management (CSNM) in November 2006. A dossier was submitted for full accreditation following the conditional accreditation of Campus d'Alfred by Ontario Association of Veterinary Technologist (OAVT) as a new site offering the Veterinary Technician diploma. A visit of the OAVT accreditation team was made in the fall 2006. Following their recommendation, new laboratory equipment was acquired, and a rodent colony will be built on Campus in the fall 2007. Campus d'Alfred expects to obtain full accreditation before the end of 2007.

2. New Faculty

Two new Faculty members in the Animal and Poultry Science department, but located at Campus d'Alfred, were hired in the spring and summer 2007. Dr. Renée Bergeron, the new director of Campus d'Alfred, will have a teaching role within the Agriculture diploma program and the Veterinary technician program. Dr. Robert Berthiaume, director of the Alfred Organic Dairy Research Centre, will also teach at the diploma level, in the area of beef and dairy cattle nutrition.

3. Videoconference facilities

Collège Boréal expanded its long-term collaboration with Campus d'Alfred by providing videoconference equipment. The new long-distance teaching facilities will allow vet tech students to benefit from teaching staff's expertise at both locations.

Guelph Campus

1. Staffing Changes

A number of changes have been made with regards to sessional instructors within the program. For example; Computers and Math for Turf and Turf Environmental Management will both have new sessional instructors for the 2007/08 academic year. Guelph is close to announcing a new hire for the Bachelor of Bio-Resource Management degree program. This is a three year contractually limited scientist position. Dr. Beverly Hale is leading the hiring committee.

2. Accommodation Issues

Challenges continue to exist with regards to the availability of suitable classroom facilities on the UofG campus. The expansion to the Bachelor of Landscape Architecture program has resulted in the loss of access for students in the Associate Diploma in Turfgrass Management program to studio space located within the Landscape Architecture building. This space has been used in the past for landscape and golf course design and also for construction courses within the Associate Diploma in Turfgrass Management program. Alternative space currently made available in the more traditional classrooms has proven to be less than desirable as drafting tables are not available; this limits our ability to effectively deliver courses which have a significant design and drafting component.

The availability of specialized lab space for hands-on technical experience continues to be an issue. A proposal is being developed to utilize the vehicle shed at the Guelph Turfgrass Institute as a lab space during the winter semester. This would allow students to gain practical hands on experience with construction, drainage and irrigation projects.

Kemptville Campus

1. Activities

The Food Nutrition and Risk management program received full accreditation for the next five years by the Canadian Society of Nutrition Management.

A New Applicants Day was introduced in March 2007, when about 150 students and their families attended the campus. This was part of a new process in which monthly contact has been made with prospective students from the initial contact to them registering for a course. We also held a one day Orientation Workshop for new students in July 2006.

A one day orientation workshop was initiated to help contract instructors understand the teaching objectives for the campus.

We have refurbished the classroom in the A.M. Barr arena which will enhance the ability to provide classroom instruction close to practical examination of animals in the arena. We have also upgraded the laboratory for Equine Anatomy and Animal Physiology, and Microbiology.

2. New Faculty

Two new faculty members in the Department of Animal & Poultry Science, but located at Kemptville Campus, were hired in 2007. Dr. Trevor Devries, a specialist in Dairy cattle behavior

will have a teaching role within the Agriculture diploma program, and is the lead scientist at Kemptville for the Ontario contribution to the Canadian Bovine Mastitis Research Network. Dr. Uta von Borstel, who specializes in equine behavior and animal rider interactions, will teach in the Bachelor of Bio-Resource Management and Agriculture Diploma (Equine option) programs.

3. Program Efficiencies

We have simplified the choice of electives in our diploma program and a smaller number of electives is now available to all diploma students from any program.

4. Academic Partnerships

We have built on the Reconnecting and Engaging through Apprenticeship and Skills (REALS) partnership which now includes students from Grade 7 and 8, and 10 as well as senior high school students. We hosted a College Dialogue Day for 55 Guidance Councilors from Eastern Ontario and we gave them information on the programs at Kemptville and community colleges in the Region.

Ridgetown Campus

1. Opening of Rudy H. Brown Rural Development Centre

On November 7, 2006, the new 30,000 square foot Rudy H. Brown Centre was opened offering students three new classrooms, a new lecture theatre and a new double gymnasium. Students have now utilized these new facilities for classes, exams, recreational activities, athletics and graduation. The new building also has six professional offices and is being occupied by our Environmental Management staff and former Campus Director, Dr. Gary Ablett. The province of Ontario contributed \$4.1 million to this tremendous new educational facility. This facility is an outstanding addition to the Ridgetown Campus.

2. Welcome of First Degree Students

In September 2006, Ridgetown Campus welcomed its first group of degree level students. These students are studying in the Bachelor of Bio-Resource Management degree program and will complete semesters 1- 4 at the Ridgetown campus and semesters 5-8 at the Guelph campus. This was a milestone event at the Ridgetown campus and we look forward to working with OAC and Ministry of Training Colleges and University (MTCU) on additional degree level training options. The fourteen students that began the class all successfully completed semesters one and two. These students are enjoying the small campus atmosphere and availability of teaching/research staff. Our challenge is to attract a larger number of degree students.

3. New Diploma Initiatives

The campus continues to work on the development of two new programs; the Food Industry Laboratory Technician and the Greenhouse Grower diploma. With the retirement of Dr. Ron Pitblado, Associate Director of Academics, the development of these programs now continues under the direction of Dr. Irene Moore. Dr. Irene Moore, former Co-ordinator of the Veterinary Technology Diploma program, was recently named the new Associate Director of Academics at Ridgetown Campus.

4. New Position Hiring

Now that the Bachelor of Bio-Resource Management (BBRM) degree program has been initiated at Ridgetown a new hire will have to be announced for the Guelph Campus BBMR degree program.

5. Replacement Hiring for Teaching and Teaching /Research Positions

Ridgetown Campus is currently completing the interview/hiring process for three important teaching and teaching /research positions at Ridgetown including:

- A Veterinarian for the Vet Technology Programs (Opening due to the retirement of Dr. Wayne Cole)
- A Vegetable Crop Pest Management Specialist (Opening due to the retirement of Dr. Ron Pitblado)
- An Agronomist (Opening due to the retirement of Dr. Arend Smid)

6. 2007 Leadership Changes Announced at Ridgetown Campus

On January 15, 2007, Dr. Art Schaafsma became the ninth Director of the Ridgetown Campus, replacing Dr. Gary Ablett, following his two consecutive 5- year terms as Director.

In mid-May 2007, Dr. Irene Moore became the new Associate Director of Academics, replacing Dr. Ron Pitblado, following his two consecutive 5-year terms.

In August 2007, John Zandstra, fruit and vegetable researcher, became the new academic program co-ordinator for the Agriculture diploma, replacing Dr. Peter Sikkema, following his completion of two 5-year terms.

7. Ridgetown Learning Trust

The Ridgetown Agri-Food Foundation launched a campaign to raise \$1.0 million or more for an endowment fund to support degree, diploma and certificate education initiatives at the Ridgetown campus.

2.1.3 Diploma Education Programs – Update

Campus d’Alfred

Following a review of the Agriculture Diploma program, the number of specializations was reduced in the fall of 2006. This review process will be completed in the fall of 2007, with the new intake of first year students. Enrolment in the third year of the Food, Nutrition and Risk Management Diploma program was low in September 2006; however, additional promotional efforts are being made through guidance counselors and high school visits.

Campus d’Alfred is reviewing its promotional strategy and has increased collaborative work with school boards. For instance, in 2006, “Reach Ahead” experiences in the field of nutrition and agriculture were offered to high-school students from South-Western Ontario and Eastern Ontario. Additional “Reach Ahead” experiences to high-school students within the context of the “Specialist High Skills Major” in agriculture, hospitality and tourism, environment, and business and health are planned for the next academic year.

Guelph Campus

There have been few changes to the program over the past year. The course Turf Environmental Management was moved from semester four to semester two to allow students to prepare for and write their pesticide applicators license examination prior to the required internship between semester three and four. To accommodate the change, the course Business and Finance for Turf was moved to semester four.

In order to improve communication with students during the internship period, a number of faculty and sessional instructors volunteered to act as faculty supervisors for students during their internship. This involved weekly communication between the student and their faculty supervisor as well as workplace visits where it is geographically feasible.

Industry support for the program continues to be strong. A range of industry professionals host field trips at their business for the first semester Turf Industry course. The Sports Turf Association also provided a significantly reduced registration fee for students to attend their fall field day held in St. Catharines in 2006. Current model maintenance equipment, pesticide application equipment and reel grinding units are provided at no cost for the purposes of providing hands on teaching of the Turf Equipment course. Sample materials are also provided to instructors in the Irrigation & Drainage course. Significant contributions are made by industry based technical experts and experienced practitioners who provide in-class technical training and guest lectures.

Turf Care Products, a major distributor of turf management equipment and products continues to sponsor the student run Turf Club. The company provides funding for a speaker's program that brings in guest speakers from across Canada for Turf Club meetings.

Kemptville Campus

There were a total of 196 students enrolled in the OMAFRA-funded Diploma programs at Kemptville in the 2006/07 academic year. Enrolment in the Agriculture Diploma was 153 students, 73 of which were in the equine option. A number of students transferred from one program to another (1 graduate from Food Service Worker Certificate to the Food Diploma, 2 graduates from the Agriculture Equine Option transferred into the Agriculture Diploma - general). Food Nutrition and Risk Management Diploma students numbered 29. The total number of Horticulture Diploma students was 16. The Co-op Diploma in Agricultural and Heavy Duty Equipment (not funded by OMAFRA) had 33 students. Thus the total number of diploma students was 229.

Kemptville Campus hired a new Recruitment Officer, Anthony Vanmunsteren, starting in September 2006 and he was succeeded by Vanessa MacDougall in January 2007. A significant effort was made to promote our programs directly to high school teachers in related areas of study and to guidance counselors. This resulted in a significant upturn in students applying for the 2007/08 academic year.

Graduating students from Kemptville have a number of post diploma opportunities which allow them to move into degree programs. This year Luther VanGilst, (Agriculture) who gained the Governor General's Bronze medal as the student with the highest cumulative average in any degree program was accepted into the business management program at McGill University. Other students were successful in other national competitive programs. Richard Kloostra (Agriculture) was awarded a millennium scholarship, Joshua Mowbray (Agriculture) won the Canadian Farm Business Management Council Essay competition, and Anna Rees (Food Nutrition and Risk Management) was awarded the Canadian Society of Nutrition Management Student Bursary.

Ridgetown Campus

There were 417 students enrolled in OMAFRA funded diploma education programs at the Ridgetown Campus. This 10% decrease in diploma numbers for the 2006/07 year is partially due to the fact that we did not have a Vet Tech – Alternative Delivery program intake in fall 2006.

Approximately 10% of our graduates continue with further education programs following the completion of their diploma studies.

Diploma program student numbers remained strong with course program evaluations remaining strong as well. In 2006/07 no significant course changes occurred in the Agriculture, Horticulture, Environmental Management or Veterinary Technology diplomas. Several changes were successfully implemented in the previous year. In addition, the academic programs were working with the retirement of Dr. Ron Pitblado, who left Ridgetown Campus in December 2006. Dr. Pitblado had also been working as the Acting Campus Director for this fiscal year, in the absence of Dr. Gary Ablett.

The Ridgetown Campus continues to investigate and evaluate the opportunities to deliver diploma courses through the Office of Opening Learning. Ridgetown has had some good successes with this method of off-campus delivery and will continue to evaluate the pros and cons of this teaching technology.

Several students have taken advantage of the "Two Diplomas in Three Years" being promoted by the Ridgetown Campus. By successfully completing their first two years in either Environmental Management or Horticulture and then completing one final academic year in Agriculture, a student can earn two UofG Associate Diplomas in three years which has allowed those students even greater employment opportunities.

Graduating students from Ridgetown have several post-diploma opportunities which lead to degrees. Students can move into degree programs at the UofG campus with significant credits being transferred as well as to other institutions beyond Ontario's borders with articulation agreements providing near seamless transitions into other programs. For example; Ridgetown's Veterinary Technology graduates receive their full two diploma education courses as degree equivalents when transferring into the four-year Purdue University Veterinary Technology degree program. Similarly, articulation agreements with Olds College in Alberta allow our Agricultural graduates to enter as third year students in the Bachelor of Applied Science degrees in Agri-

business and our Horticultural graduates have the same opportunities in degree granting programs for Ornamental Horticulture. Further efforts are being made to offer Ridgeway's students opportunities into degree programs throughout North America.

2.1.4 Certificate Programs/Apprenticeships

Campus D'Alfred

A new Certificate in Meat Food Safety is being developed. This training program for meat inspectors and meat industry employees who interact with inspectors is under development for OMAFRA and CFIA. Development is expected to continue through 2007/08.

Campus d'Alfred delivered a pre-apprenticeship program (MTCU funded) in partnership with La Cité Collégiale. Two additional apprenticeship programs (within the Ontario Youth Apprenticeship Program - OYAP) Agriculture equipment technician apprenticeship and Heavy equipment technician apprenticeships are being developed with the expectation of being offered in collaboration with La Cité Collégiale in the context of "Specialist High Skills Major" in transportation and agriculture.

Working with French-language school boards, Campus d'Alfred is offering a Horticultural technical apprenticeship and a Dairy herdsman apprenticeship, both within the context of the OYAP program, and as part of the "Académie des métiers" (trades academy).

Guelph Campus

A number of on-line Horticulture and Turf Management certificate courses are offered through the Office of Open Learning. These courses are offered in structured twelve week blocks that parallel the on-campus semester schedule. Certificate programs currently offered include:

- Sustainable Landscapes
- The Horticulturist
- Creating Landscapes
- Managing Golf Courses
- Growing Plants for Profit

Kemptville Campus:

Kemptville Campus Welder Apprenticeship - As of the fall 2006, and as part of an expanding welder-training program, Kemptville Campus became an MTCU approved Training Delivery Agency (TDA) for the Welder Apprenticeship. The apprenticeship program is a partnership between the employer, the employee, MTCU and a TDA. Apprenticeship provides "hands on" training in the workplace, theoretical teaching in the classroom and certification upon successful completion. The program (780 hours) is taken in three separate levels of practical and theoretical instruction.

There were 65 students registered, and 64 graduated from four full-time one year certificate courses in 2006/07 (Equine Management, Industrial Welding & Fabrication, Diesel Equipment Mechanic and Food Service Worker Certificate). These programs complement the OMAFRA based diplomas by allowing students to move from one program to another and to have diploma students take courses (for credit or interest) such as; welding and small engines or riding. These certificate programs also attract students who live in residence and participate on Students' Council and clubs.

The Ministry of Health and Long Term Care advised all Long Term Care homes that as of July 1, 2006 they would have one year to comply with the requirements that at least 50% of food handlers are required to complete or enroll in the Food Service Worker program. Any new hires would have to have their certificate. This requirement by the ministry will have a positive impact on the enrollment over the next couple of years here at Kemptville. Since 1997 Kemptville has been very active in recruiting students for this program and has established an excellent reputation throughout Eastern Ontario. Food service workers and Long Term Care homes are now asking Kemptville to carry out the training at their facilities.

Ridgetown Campus:

This year the Veterinary Medical Office Administration (VMOA) Certificate program celebrated the completion of 10 years of program delivery. In the decade this cost-recovery program has been offered, it has received strong endorsement from industry with graduates readily finding work opportunities. The program has 25-30 students/year with tuition and other fees helping to support Ridgetown Campus. Tuition and associated fees is \$7,052.00/year.

Applicant numbers in the Landscape Management Certificate program were not growing, and were insufficient to meet budget needs, thus the program was not offered in fall 2006.

2.1.5 Business Development Programs

The Business Development Units at each campus continue to offer a wide diversity of regional training needs on a full cost recovery basis. Some highlights for 2006/07 include:

- Training for water plant operators (First Nations Technical Services Corporation, INAC, Health Canada) through Campus d'Alfred.
- In 2006, Campus d'Alfred entered into an Agreement with Industry Canada for funding support of a new "telelearning" capacity in the French language, which includes translation costs of online content for a five course Environmental Certificate to be delivered to university-level francophone students in 2007/08.
- Campus d'Alfred is pursuing the development of an innovative community outreach, recruitment and training model with French-speaking internationally educated technicians and professionals interested in rural life and work, in collaboration with multicultural organizations in Greater Toronto and Ottawa areas.
- AgriBusiness eCampus - Numerous studies conducted to date clearly confirm the link between agricultural sustainability and business management. The aim of the agriBusiness eCampus at Kemptville is to become the "go-to place" for education and information,

- giving agri-food businesses the knowledge and skills they require. This initiative is bringing together a wealth of existing training material developed by a variety of agencies and organizations, and will provide greater access to a broader range of agri-business producers. The eCampus will provide Life-long Learning - web-based and face-to-face resources for farmers and producers in a variety of formats that will include: E-Membership, a Web-Based E-School - E-Courses / E-Discussions, E-Library, E-Seminars and E-Networking Discussions
- The Agroforestry Education Centre at Kemptville was first opened in 1993 with the goal to provide educational resources to the growing agroforestry and maple syrup production industries. Now 14 years later, with the generous support of industry partners including: Grenville Community Futures Development Corporation and Industry Canada, the Kemptville College Foundation, OMAFRA, Lapierre/Waterloo/Small Inc., the Grenville Land Stewardship Council and the Ontario Maple Syrup Producers association, the Agroforestry Education Centre has undergone a \$100,000 renovation. Equipment upgrades included a new maple production facility with state of the art reverse osmosis process, new maple sap collection pipelines, and new signage. Education programs for school-aged children were developed as part of the initial initiative, and HACCP and GMP protocols are currently in development.
 - Kemptville received funding from the Grenville Community Futures Development Corporation, under the Youth Internship Program, to support five, six month internship positions. The interns have carried out a number of activities in support of our Diploma, Certificate and Business Development programs, including curriculum development, student recruitment, marketing and Industry Career events.
 - Ridgetown completed Year 2 of the Agreement with OMAFRA to deliver the Nutrient Management Training and Certification Program, providing logistics, administering exams, and engaging in course development.
 - Ridgetown completed Year 2 of the Agreement with the Ministry of Environment and the Walkerton Clean Water Centre to provide logistics and registration management services for two mandatory courses for operators of Ontario drinking water systems.
 - Ontario Pesticide Education Program (OPEP) continues to operate the provincially mandated Grower Pesticide Safety Course and the Vendor Certification Course with the support of OMAFRA, AGCare, Ministry of Environment (MOE), OABA, CropLife, and the UofG. Private applicator certification has been legislated under the *Pesticides Act* since 1991, and offered by OPEP since 1988. Each year, there are about 20% fewer growers who participate in certification from the five years previous.
 - The Ag Business Centre at Ridgetown continues to partner with Economic Development Services of the Municipality of Chatham-Kent (CKEDS) to provide support to the rural community, including administrative support to the annual *South West Ag Conference* and *South Western Ontario Pork Conference* in partnership with OMAFRA, producers and industry; co-ordinating elementary school programs in partnership with the Lambton-Kent Agriculture in the Classroom Action Committee; and providing office space and administrative resources to various producer and commodity organizations.
 - Ridgetown continues to work with the industry-led Ontario Livestock Medicines Education Committee to deliver training programs on the safe use of livestock medicines on farm. In the absence of mandatory provincial certification, enrolment continues to be low.
 - Through an Agreement with the MOE, Ridgetown administers pesticide training & certification for candidates who wish to apply to the MOE to become Licenced Exterminators through the Ontario Pesticide Training and Certification Program

- Ridgetown Campus continues to administer a voluntary IPM Accreditation Program to recognize landscape companies, municipalities, and golf courses through a process of certification, audit, and professional development. This is offered through a program administration contract with the IPM-PHC Council, hosted by Landscape Ontario.
- Ridgetown continues to offer four correspondence courses that qualify for CEUs through the Ontario Association of Veterinary Technicians.
- Ridgetown entered into an Agreement with the Ontario Independent Meat Processors and OMAFRA to deliver the Food Handler Training Course as a correspondence course to the food processing industry.

2.1.6 International Programs

Campus d'Alfred was involved in international projects in the following locations during fiscal year 2006/07: Morocco, Chad and Senegal (these projects are all CIDA-funded through the partnership branch). The Morocco project will continue until March 2011 and the Chad project until March 2010. The Senegal project has been approved in 2006/07 and will last until 2011.

Collaboration with Kemptville Campus has also been developed. A representative from Kemptville Campus attended a meeting in Tanzania, organized by the Association of Canadian Community Colleges (ACCC). This initiative has been successful and both campuses expect to respond to a new request for proposals (RFP) to be released by the ACCC in the fall of 2007.

Other financial opportunities have been explored during 2006/07, which include meetings with the Embassy of Niger and the CIDA representative for this country, Mr. Vincent Lepape, and a special formation in Washington with the Multilateral Development Bank (MDB).

Campus d'Alfred is also planning to respond to the next round of RFP from the Association des Universités Francophones (AUF) and the Ressources Humaines et Développement Social Canada (RHDSC) for academic and student international mobility.

The Associate Diploma in Turfgrass Management at the Guelph campus continues to work with the Ohio State University international internship program to provide high quality internship experiences for students interested in doing their internship in the United States. A group of students in the Associate Diploma in Turfgrass Management at the Guelph campus once again participated in the Farmlinks Experience at Farmlinks, an innovative research and demonstration golf course located outside of Sylacauga, Alabama. Each year Farmlinks sponsor a group of student leaders to attend a three day program at the Farmlinks property which exposes the students to current fertilizer technologies and production as well as the technical development process for equipment and other turf management products.

On the International front; The Kemptville Campus Business Development Centre developed "custom" training for Chinese government officials.

Other custom training courses include:

Adapting to Global Markets – Canadian Producer Associations - we have provided custom training for the various producer and industry associations that support the Canadian agrifood

industry, commodity groups, government and industries at local, provincial and national levels.

Adapting to Global Markets - Canadian Food Safety Information networks - This program focused on Canada's experience with creating and maintaining food safety - the main aspects of Canada's food safety systems - how industry, Health Canada, CFIA (Canadian Food Inspection Agency) and other ministries and agencies contribute to the high quality of foods available for consumption in Canada and for export.

2.2 Summary

The OMAFRA/UofG Agreement provides for a coordinated and effective broad educational mandate that is being met and strengthened annually. The hallmark of these programs is the two and three-year residential diplomas valued by each campus, the industry and the communities they serve. These programs are complemented through a myriad of certificates, apprenticeships, training programs and international activity, all of which promote the uniqueness and value of the Agreement between OMAFRA and the UofG.

2.3 Diploma Education Program Performance Measures

Objective	Measure/Activity	Result
1, A, B, C Deliver high quality education and training programs that meet the needs of the Ontario agri-food and rural sectors.	A. Deliver programs using the most current knowledge and skills available through effective teaching programs	A. The best measures of the quality of the educational programs are the very high placement rate of students from all programs each year, the increase in accreditation and articulation agreements with industry and other institutions respectively, the increase in the value of student awards funded by industry and the increase in instructor training and qualifications. Most programs have advisory boards or steering committees made up of industry leaders who review curriculum content and delivery annually. An improvement in teaching facilities has been initiated as a consequence of an infusion of minor-capital funds. Campus d'Alfred, in partnership with Cégep Édouard-Montpetit in Longueuil, Québec, has received a contribution from RCCFC (Regroupement des cégeps et des collèges francophones du Canada) for expertise transfer and institutional reinforcement. In the first phase of the project (2006/07), Campus d'Alfred teaching staff has received training and coaching from education expert in program and course development using the "competency approach". The second phase of this project (2007/08) will concern teaching approaches, learning styles and evaluation tools. With this project, teaching staff in Alfred will benefit from over 100 hours of teaching and coaching. April 2007Ridgetown Campus held a three day Teacher Training program for staff at the three regional campuses. Staff received information and training in several aspects of effective teaching.
	B. Develop MTCU-style program measures and standards.	B. Program standards and measures has been developed and approved at The Provincial Diploma Committee for the Agriculture and Horticulture diplomas. In the Fall 2006 the Food Nutrition and Risk Management Diploma programs at Kemptville and Alfred were reviewed by the Canadian Society of Nutrition Management, and a full five year accreditation was received for each campus.
	C. Report annually on: - % student satisfaction - satisfaction of employers with graduates hired - percentage of graduates finding full-time employment	C. Student satisfaction remains high in all programs at all locations. For example at Kemptville the annual May survey of graduates indicated that 75% of graduates were satisfied or very satisfied with their decision to attend the institution. 80% of graduates were employed on the day of graduation, with 73% working in their chosen field. Job placement rates are very high ranging from 76% - 100% across the four institutions and five programs. Overall for the 316 graduates this represents greater than 87% employment level shortly after graduation.
	Maintain enrolments, graduations, employment levels and satisfaction of students and employers. Reduce attrition rates.	Enrolment levels decreased slightly in 2006/07 and graduation rates were essentially maintained. Employment and satisfaction levels were maintained. Attrition rates in the two-year diplomas were decreased for the 2005 cohort and maintained for the 2006 cohort (Table 2.2-3). Part of the decrease in enrolment is due to the zero intake of students in the Vet Tech Alternative program for the fall 2006.

Objective	Measure/Activity	Result
2 Strategy identifying new and regionally differentiated directions for education and training programs	By April 2005, complete Strategy, for presentation to Executive Committee	2003/04 strategic changes have been implemented with introduction of the Bachelor of Bio-Resource Management, Equine Management Degree Program scheduled to start in the fall 2007 at Kemptville. A review is taking place of the Food Nutrition and Risk Management Program at Kemptville and Alfred with a view to develop separate streams for agri-food and health care students. The Ridgetown Campus welcomed its first group of degree students. This brings new tuition revenue from MTCU to Ridgetown. In addition, these students bring residence and meal plan dollars to the campus as well.
3 Increase College revenues through partnerships with industry or other educational institutions	Demonstrate positive growth in non-OMAFRA revenues over the 5-year term of the Agreement. Report annually on % change in non-OMAFRA funding.	Non-OMAFRA revenues related to Diploma programs and Continuing Education/Business Development and Training programs increased by \$986K, to \$11.66 million in 2006/07. This represents an increase of 9.2% over 2005/06 levels
4 Continuing Education Programs	Expand CE Programs on a cost recovery basis, meeting regional needs. Track and report cost recovery status of CE Programs. Maintain 2001/02 levels of CE revenues	The revenues for CE/BDT programs increased substantially by 20% compared to 2005/06 levels with revenues over \$6.3 million. Total net expenditures reported in 2006/07 were higher than 2005/06 levels.
5 A, B Financial Accountability	Report annually on: - Annual average cost per diploma student - Annual cost per student by Diploma Program Maintain or decrease cost per student from 2001/02 level.	The average net cost per diploma student in 2006/07 on a fully allocated basis was \$6.2K per student across all programs and institutions a substantial increase over 2005/06. Costs per diploma program are listed in Table 2.3.6 and reflect costs in previous years.

Enrolments

Table 2.3.1: Summary of Diploma Program Enrolments (Full-time students)

	Alfred	Kemptville	Ridgetown	Guelph	Total	Change
2006/2007	92	229	417	60	798	-7.3%
2005/2006	96	217	466	58	861	1.0%
2004/2005	113	217	464	63	857	-12.8%
2003/2004	128	254	398	203	983	-7.5%
2002/2003	115	229	360	359	1,063	3.3%
2001/2002	109	223	341	356	1,029	-2.3%

Graduation Statistics

Table 2.3.2: 2006/2007 Graduates

Diploma Program	Alfred		Kemptville		Ridgetown		Guelph		Total	
	05/06	06/07	05/06	06/07	05/06	06/07	05/06	06/07	05/06	06/07
Agric. - Graduates - % Employed	14 92%	12 100%	66 95%	69 84%	95 100%	77 99	--	--	175	158
Horticulture - Graduates - % Employed	--	--	1 100%	9 86%	27 95%	24 93%	21 100%	25 100%	49	58
Envir. Mgt. - Graduates - % Employed	--	--	--	--	25 92%	26 92%	--	--	25	26
Food - Graduates - % Employed	10 100%	--	23 60%	16 71%	--	--	--	--	33	16
Equine - Graduates - % Employed	--	--	--	--	--	--	--	--	--	--
Vet Tech - Graduates - % Employed	23 91%	25 92%	--	--	33 84%	33 80%	--	--	56	58
Total - Graduates - % Employed	47 93%	37 94%	90 86%	94 76%	180 96%	160 90%	21 100%	25 100%	338	316

Table 2.3-3: Attrition Rates for 2005 and 2006 Diploma Cohorts (2-year programs)

Table 2.3.3a: 2005 Cohort

	Alfred	Kemptville	Ridgetown	Guelph	Total
# Enrolled in Fall '05	45	143	198	33	419
# Enrolled in Fall '06	38	125	178	30	371
# Graduated	37	109	160	25	331
Attrition in Year 1	15%	13%	10%	9%	13%
Attrition in Year 2	2%	13%	10%	17%	11%
Total Attrition	18%	24%	19%	24%	23%

Table 2.3.3b: 2006 Cohort

	Alfred	Kemptville	Ridgetown	Guelph	Total
# Enrolled in Fall 2006	39	104	183	30	356
# Enrolled in Fall 2007	44	86	155	26	311
Attrition Year 1	13%	17%	15%	13%	13%

Note: Number of graduates listed in Table 2.3.2 may be slightly higher than listed in Table 2.3.3 as each year a few students from previous classes complete their requirements for graduation.

Table 2.3.4: Summary of Attrition Statistics – 2 year Diploma Program

	Alfred	Kemptville	Ridgetown	Guelph	Total
<u>Attrition in Year 1</u>					
2006 cohort	13%	17%	15%	13%	14%
2005 cohort	16%	14%	6%	6%	10%
2004 cohort	14%	14%	3%	3%	8%
2003 cohort	17%	20%	14%	6.5%	16%
2002 cohort	21%	18%	7%	19%	16%
2001 cohort	19%	25%	5%	7%	12%
<u>Attrition in Year 2</u>					
2006 cohort	n/a	n/a	n/a	n/a	n/a
2005 cohort	2%	11%	9%	15%	9%
2004 cohort	12%	6%	6%	28%	8%
2003 cohort	17%	7%	7%	10%	8%
2002 cohort	21%	15%	9%	0.6%	9%
2001 cohort	12%	23%	14%	17%	17%
<u>Total Attrition</u>					
2006 cohort	n/a	n/a	n/a	n/a	n/a
2005 cohort	18%	24%	19%	24%	21%
2004 cohort	22%	21%	10%	38%	17%
2003 cohort	34%	28%	19%	16%	24%
2002 cohort	29%	30%	15%	20%	24%
2001 cohort	29%	42%	19%	24%	27%

Table 2.3.5: Attrition Rates for 3-year Vet. Tech. Program at Ridgetown

The summer Vet. Tech. program is a three-year course, so the numbers cannot be included with the two-year program numbers. This table summarizes the enrolments and attrition rates for this program.

Summer Vet Tech Cohorts Summer Vet Tech Cohorts

	Cohort Year				
	2002	2003	2004	2005	2006
# Enrolled in Fall 2002	43 ⁽²⁾				
# Enrolled in Fall 2003 ⁽¹⁾	35	0 ⁽¹⁾			
# Enrolled in Fall 2004	35		45		
# Enrolled in Fall 2005			34 ⁽²⁾	44	
# Enrolled in Fall 2006					0
Graduated	32	0 ⁽¹⁾	31*		
Attrition in Year 1	19%		13%		
Attrition in Year 2	3%				
Attrition in Year 3	0%				
Total Attrition	11%				

⁽¹⁾ No intake of Vet. Tech. students in Fall 2000 and 2003 due to space limitations.

⁽²⁾ This number is adjusted from the 2001/2002 and 2004/05 Annual Report respectively to reflect actual enrolment rather than pre-registration numbers.

* Expected graduates October 2007

TABLE 2.3.6: 2006/2007 Teaching Cost (1) Per Student By Program (In Thousand's Of Dollars)

	<u>DIPLOMA PROGRAMS</u>						<u>TOTAL</u>
	<u>AGRI</u>	<u>ENV'T</u>	<u>FOOD</u>	<u>HORT</u>	<u>TURF</u>	<u>VET TECH</u>	
<u>SUMMARY</u>							
NUMBER OF STUDENTS SEPTEMBER 2006	396	68	71	68	64	211	878
TOTAL EXPENDITURES ^(1 AND 2)	4,889	600	1,169	1,236	345	2,563	10,802
TOTAL EXPENDITURES / STUDENTS	12.3	8.8	16.5	18.2	5.4	12.1	12.3
REVENUES	2,734	294	353	536	247	1,180	5,344
TOTAL NET EXPENDITURES ^(1 AND 2)	2,155	306	816	700	98	1,383	5,458
TOTAL NET EXPENDITURES / STUDENT	5.4	4.5	11.5	10.3	1.5	6.6	6.2
LOCATIONS WHERE PROGRAM IS OFFERED:							
ALFRED	✓	✓	✓			✓	
KEMPTVILLE	✓		✓	✓			
GUELPH					✓		
RIDGETOWN	✓	✓		✓		✓	

⁽¹⁾ 'Teaching Costs' include direct costs plus allocated academic services plus location infrastructure and support but exclude both location ancillary costs (cafeteria, residence) and allocated institutional service costs.

⁽²⁾ Utility and maintenance costs, normally included in infrastructure costs only at College d'Alfred, have been removed from Alfred's costs to allow direct comparison of Cost per Student to other Colleges.

TABLE 2.3.7: 2006/2007 VALUE OF DIPLOMA STUDENT ASSISTANCE

	ALFRED		KEMPTVILLE		RIDGETOWN		GUELPH		TOTAL	
	05/06	06/07	05/06	06/07	05/06	06/07	05/06	06/07	05/06	06/07
STUDENT AWARDS (\$)	28,775	39,325	71,075	64,075	123,700	113,889	10,850	13,850	234,400	231,139
VALUE OF AWARDS (\$) PER STUDENT *	300	427	328	280	265	273	187	280	272	290

* Total value of awards divided by the total number of diploma students in all programs.

2.4 Business Development Training

* Activities for Business Development Training are funded through contracts and certificate courses (including residential programs of up to one academic year), with the objective of attaining cost self-sufficiency.

Table 2.4.1: Student Days and Range of Fees/Student Day for C.E. Courses.

	Alfred		Kemptville		Ridgetown		Total	
	05/06	06/07	05/06	06/07	05/06	06/07	05/06	06/07
# of Student Days (6 hrs/day)	8,484	6,022	27,354	25,377	19,754	19,782	55,592	51,181
Diploma Student Equivalent ⁽¹⁾	70	50	228	211	165	165	463	426
Fees/day (\$) ⁽²⁾	30 - 160	60-180	85 - 200	85-200	85 - 200	85 - 435		

⁽¹⁾ Calculation: Divide number of student days by 120 (the number of days in a student year)

⁽²⁾ This shows the range in course fee charges, per day, to provide some contextual comparison from year-to-year and location-to-location.

2.5 Veterinary Clinical Education Program

2.5.1 An Overview

The Veterinary Clinical Education Program (VCEP) Agreement provides annual base funding to the Ontario Veterinary College (OVC) to meet the continuing needs for:

- “veterinary graduates who have a high level of appropriate clinical experience in veterinary medicine to service Ontario animal owners”;
- “an animal referral hospital which will service satisfactorily Ontario’s veterinary practitioners and animal owners”.

2.5.2 Objectives of the Program

- A. Meet the accreditation requirements of the Canadian and American Veterinary Medical Associations as well as the College of Veterinarians of Ontario,
- B. Provide the clinical education component for veterinary students in the Doctor of Veterinary Medicine undergraduate program,
- C. Operate the Veterinary Teaching Hospital clinics including large animal, small animal, field service and diagnostic laboratories,
- D. Offer a one-year post-graduate Veterinary Internship Program in the large animal and small animal clinics,
- E. Offer an advanced clinical training program entitled Doctor of Veterinary Science (D.V.Sc.) in various medicine and health maintenance disciplines,
- F. Offer an externship program of approved clinical experience with a private veterinary practitioner or a relevant public/private sector organization,
- G. Offer referral and emergency veterinary services to Ontario veterinary practitioners and the animal-owning public. These include medicine and health maintenance services.

2.5.3 Resource Allocation

To meet the objectives of the VCEP agreement, VCEP funds were allocated to three programs: the Clinical Education Program (Objectives A to D and G), the D.V.Sc. Program (Objective E) and the Externship Program (Objective F). Table 2.5-1 summarizes the program’s objectives, budget and expenditures. The total available VCEP budget in 2006/2007 was \$4,680,442. For the year ending April 30, 2007 expenditures totalled \$4,681,120 leaving a balance of (\$678). Of this budget, \$3,928,324 went towards the Clinical Education Program (CEP), \$500,772 to the D.V.Sc. program and \$252,024 to the Externship Program.

The CEP portion of VCEP funded 11.5 faculty FTEs in the Departments of Clinical Studies and Population Medicine. These faculty positions support teaching and service in large animal

medicine and surgery, anaesthesia, dairy, beef, sheep and swine health management and theriogenology. It also supported 2.76 professional staff, 21.80 staff, 6 internship students and 7 staff veterinarians in the OVC Teaching Hospital (OVCTH).

The D.V.Sc. portion provided funding for 24 of the College's 41 D.V.Sc. students. The Externship portion of VCEP provided support for the student relocation allowance, organizational support staff, operating expenses and insurance needed to deliver the course. The latter 8 week fourth year course is generally taken during the spring semester and is compulsory for all DVM students.

Table 2.5.1: VCEP Budget and Expenditures for Core Strategic Programs by Objective: 2006/2007

Programs	Objectives ⁽¹⁾	Expenditures Compared to Budget 2006/2007
Clinical Education	A Meet accreditation requirements	Personnel 1,464,404
	B Provide clinical education component for veterinary students in the DVM Program	Operating Costs <u>2,463,920</u>
	C Operate the veterinary teaching hospital	Total 3,928,324
	D Offer a one-year internship program	Budget <u>3,925,079</u>
	G Offer referral and emergency veterinary services to practitioners and animal owning public in Ontario	Balance <u>(3,245)</u>
DVSc	E Offer an advanced clinical training program entitled Doctor of Veterinary Science	Support for DVSc's 500,772
		Budget <u>503,314</u>
		Balance <u>2,542</u>
Externship	F Offer an externship program of approved clinical experience	Support for External Program 252,024
		Budget <u>252,049</u>
		Balance <u>25</u>
Grand Total		Total Expenditures 4,681,120
		Budget⁽²⁾ <u>4,680,442</u>
		Balance <u>(678)</u>

⁽¹⁾ See section 2.5.2 for complete objective descriptions

⁽²⁾ Total includes a deficit carry-forward of \$20,191 from 2005/06

Performance Management Agreement

2.5.4 Clinical Education Program

In compliance with Objectives A, B, C, D, and G of the VCEP Agreement, the OVC delivers a Clinical Education Program. To support this program, VCEP funding is allocated in the OVCTH and the three academic departments involved in clinical education: Pathobiology, Clinical Studies and Population Medicine.

Clinical Education is the largest component of the VCEP agreement. This program supports the clinical training of DVM students within the OVCTH. Clinical experience is gained in the various OVCTH services that include clinics in the large animal and small animal areas, and a field service program. Additionally, the Hospital offers referral and emergency services to veterinary practitioners and the animal-owning public for 24 hours a day, 365 days of the year. One hundred and six students were enrolled in the final year program in 2006/07

Objective A: Meet the accreditation requirements of the Canadian and American Veterinary Medical Associations (CVMA, AVMA) as well as the College of Veterinarians of Ontario (CVO).

Performance Measures and Targets

Objective: To meet the accreditation requirements of the Canadian and American Veterinary Medical Associations as well as the College of Veterinarians of Ontario;

Expectation: The OVC will maintain its accredited status with the CVMA/AVMA, CVO and AAHA indefinitely.

Measurement Instrument:

- DVM Program assessment by the Council of Education of the American Veterinary Medical Association (AVMA).
- Annual Report sent to Council on Education of the AVMA.
- Accreditation of relevant clinics of the Veterinary Teaching Hospital (OVCTH) by the College of Veterinarians of Ontario.
- Accreditation status of relevant sections of the OVCTH, small animal clinical facilities, personnel and equipment by the American Animal Hospital Association (AAHA).

2006/2007 Outcome:

The OVC was granted full accreditation after the AVMA Council of Education site visit in February 2002 for a period not to exceed seven (7) years.

The AVMA accreditation process was developed to ensure quality professional veterinary education. The process uses periodic accreditation reviews to determine the degree to which the College meets a described set of standards as well as its own stated mission and objectives. The AVMA standards are recognized globally. This accreditation is crucial for the OVC to maintain its international reputation, to recruit candidates, to serve its mandate of teaching, research and service and to subsequently train veterinarians to meet the needs of the Province of Ontario.

The College of Veterinarians of Ontario (CVO) administers the Ontario Veterinarians Act. One requirement for licensure in Ontario is graduation from an AVMA/CVMA accredited college. In addition, no person can provide service from a veterinary facility unless the facility is CVO

accredited. The OVCTH could not legally operate its various clinics without CVO accreditation. A site visit and inspection was conducted by the CVO in February 2002, with the next inspections scheduled for 2007. The OVCTH met all accreditation requirements for the small animal, food animal and mobile units.

Objective B: Provide the clinical education component for veterinary students in the Doctor of Veterinary Medicine undergraduate Program.

Outcome assessment is now an integral part of the AVMA accreditation standards. In addition to the performance measures of the VCEP agreement the OVC has established additional performance measures to monitor student performance with a view to ongoing enhancement of its programs.

Performance Measures and Targets

Objective: To determine the degree of employer's satisfaction with new DVM graduate's performance in the workplace within the first year after graduation

Expectation: That greater than 80% of employers surveyed will express satisfaction with New Graduate Performance in the Workplace during the first year following graduation from the OVC.

Measurement Instrument: Employer Questionnaire

Employers of graduates of OVC 2006 were mailed questionnaires in August 2006. These veterinarians were asked to evaluate their new employee's overall performance / competence to do the job for which he/she was hired as: Superior, Very Good, Good, Poor (marginal but acceptable) or Very Poor (unacceptable or unsatisfactory performance).

2006/2007 Outcome:

The response rate to the survey was 48%. Of the employers who responded 96% were satisfied (i.e. rated new graduates as Superior, Very Good, or Good) with their employee's overall performance/competence, three to five months after graduation, to do the job for which they were hired.

Objective: To determine OVC graduates' perception/assessment of their preparedness for the job opportunities and responsibilities encountered in the workplace

Expectation: That greater than 80% of the graduates surveyed would express satisfaction with their performance in the workplace during the first year following graduation from OVC.

Measurement Instrument: New Graduate Survey

Graduates of OVC 2006 were mailed questionnaires in August 2006. They were asked to evaluate their own overall performance / competence to do the job for which they were hired as: Superior, Very Good, Good, Poor (marginal but acceptable) or Very Poor (unacceptable or unsatisfactory performance).

2006/2007 Outcome:

The response rate to the survey was 40%. Of new graduates who responded, 97% were satisfied (i.e. rated their performance as Superior, Very Good, or Good) with their overall performance / competence, three to five months after graduation, to do the job for which they were hired

Objective C: Operate the Veterinary Teaching Hospital clinics including large animal, small animal and field service.

Performance Measures and Targets

Objective: To provide a reasonable volume of cases and teaching animals for student learning.

Expectation: A reasonably stable caseload of both client cases and teaching animals is maintained to allow instructors to teach with real clinical cases.

Measurement Instrument:

OVCTH statistics

2006/2007 Outcome:

Caseload in the Veterinary Teaching Hospital	2006/07	2005/06
Small Animal Client Admissions	13,020	12,412
Large Animal Client Admissions	1,628	1,624
Ruminant Field Service, Farm Visits	1,623	1,538

As shown above, the provision of on farm large animal services continues to be an area of emphasis.

Objective D: Offer a one-year post-graduate Veterinary Internship Program in the Large and Small Animal Clinics.

A one-year internship involves specialization in either the OVCTH's Small or Large Animal Clinics. Interns are usually new or recent graduates wishing to increase their level of discipline skills in an academic environment or to use this experience to help gain entry to more advanced graduate programs (i.e. D.V.Sc., Residency). Experienced veterinarians may choose an Internship to help them upgrade their level of knowledge or reorient their career path after some time spent in practice. The interns are paid a stipend of \$22,000 per year. Currently VCEP funds support six interns. Revenue from the OVCTH funds an additional nine interns.

Performance Measures and Targets

Objective: To provide the graduate intern with a more competitive ability for acquiring a job, either in practice or in a residency program.

Expectation: At least 30% of the Interns that applied for residencies are successful in their application, and 70% of the Interns that applied to specialty practices are successful in their application.

Measurement Instrument: Exit Survey

At the end of the program OVCTH Interns are surveyed as to their employment location and type of job for the upcoming year. Success rate in terms of obtaining a Residency will also be obtained.

2006/2007 Outcome:**As of June 2007,**

6 of 15 Interns were successful in obtaining residency programs,
2 obtained M.Sc. positions,
1 seeking Residency in the US,
5 obtained employment in private practice,
1 Temporary Teaching Assistant with OVC Exotic Service.

Objective G: Offer referral and emergency veterinary services to Ontario veterinary practitioners and the animal-owning public. These include medicine and health maintenance services.

Performance Measures and Targets

Objective: To meet the mandate as a full-service veterinary referral/emergency resource for the Province of Ontario. This service includes both emergency referral and elective referral services. The emergency service is available for 365 days / year, 24 hours / day for all common domestic species.

Expectation: All emergency referrals and 95% of all elective referrals will be accommodated by the OVC Teaching Hospital. Specialty services will be available for referral by Ontario veterinarians.

Measurement Instrument:

OVCTH statistics

2006/2007 Outcome:

2006/2007 Client Referral Caseload		
	Small Animal Client Cases	Large Animal Client Cases
Elective	10,873	981
Emergency	2,147	647
Total	13,020	1,628

2.5.5 Externship Program

In compliance with Objective F of the VCEP Agreement, the OVC delivers an Externship Program.

Objective F: Offer an Externship Program of approved clinical experience with a private veterinary practitioner or a relevant public/private sector organization.

Performance Measures and Targets

Objective: To assess progress in achieving stated learning objectives during the Externship Course.

Expectation: That a statistically significant improvement in mean clinical performance scores will be achieved in most categories tested over the course of the Externship Course.

Measurement Instrument: Interim and final evaluation questionnaires.

Joint interim and final evaluation questionnaires were used for this assessment. These questionnaires, which were completed by the externship student together with his/her Externship Course host, assessed 82 activities in large animal private primary care practice and 100 clinical activities in a small animal private primary care practice. Assessed activities included the ability to collect a relevant and accurate history, physical examination of an animal, formulation of a differential diagnostic problem list, development of a treatment plan and development of preventive strategies for common diseases and other problems encountered in domestic animals.

For the summer of 2006 (OVC 07 the improvement in students' clinical performance over the eight-week placement involved in the Externship Course was similar to that reported over the previous five years. Again, data collected for the class of OVC '07 reflected considerable consistency in the clinical capabilities of OVC students at the end of their third year of the professional program. Some areas that did not show improvement did not do so because case numbers were too few. **Summaries of the data on which these comments are based are available on request.**

Objective: To assess the extern's knowledge base and skills at the end of the Externship Placement.

Expectation: That 100% of the students will perform at a satisfactory ("C" grade) level or higher.

Measurement Instrument: Host Practitioner Evaluations.

Host practitioners evaluated their extern's clinical capabilities in terms of diagnostic process skills, delivery of veterinary care, technical skills and professional conduct at the end of the Externship Placement. Over 95% of the students in the class (n=100) achieved a score of 80% or higher. **Copies of the assessment forms and the analyses are available upon request.**

2004/2005 Outcome:

One hundred percent of the class of OVC '07 (Summer '07 Externship) performed at better than a "C" grade level.

2.5.6 D.V.SC. PROGRAM

In compliance with Objective E of the VCEP Agreement, the OVC delivers the D.V.Sc. Program.

Objective E: Offer an advanced clinical training program entitled Doctor of Veterinary Science in various medicine and health maintenance disciplines.

Performance Measures and Targets

Expectation: At least 90% of the students will complete the program successfully in approximately three years.

Measurement Instrument: University of Guelph graduate student registration data

2006/2007 Outcome:

During 2006/2007, 17 D.V.Sc. students funded from all sources completed the program. Details of department and discipline, regarding new students, in-course students and graduates are outlined in Table 2.5.6-1.

The normal duration of the D.V.Sc. program, and funding support, is nine semesters (three years).

Table 2.5.6.1: D.V.Sc. Total New Students, Enrolment and Graduations During 2006/07

Department	Discipline	New Students +	Enrolment *	Graduations
Pathobiology	Anatomic Pathology	2(2**)	3(3**)	4(2**)
	Clinical Pathology	2(1**)	9(3**)	1(1**)
	Zoo Medicine	0	1(0**)	2(1**)
	Laboratory Animal Science	1(1**)	1(0**)	3(1**)
	Comparative Pathology and Other	0	0	1(1**)
	Total Pathobiology	5(4**)	14(6**)	11(6**)
Clinical Studies	Anesthesiology	1(1**)	3(2**)	1(1**)
	Companion Animal	2(1**)	8(3**)	3(3**)
	Large Animal	1(1**)	6(5**)	2(2**)
	ICU	0	1(1**)	1(0**)
	Cardiology and Radiology	0	2(2**)	0
	Total Clinical Studies	4(3**)	20(13**)	7(6**)
Population Medicine	Theriogenology	1(1**)	2(2**)	1(1**)
	Health Management	0	3(3**)	1(1**)
	Total Population Medicine	1(1**)	5(5**)	2(2**)
Biomedical Sciences	Total Biomedical Sciences	0	0	0
OVC Total		10(8**)	39(24**)	20(14**)

Table includes all new D.V.Sc. students for the period May 1, 2006 to April 30, 2007.

* Based on Winter 2007 enrolment. Actual enrolment varies slightly over the three semesters.

+ Based on Fall 2006 enrolment. Most new students start in the Fall semester.

** VCEP supported students.

Expectation: Enrolment in the D.V.Sc. Program should be at least 20 VCEP funded students

Measurement Instrument: University of Guelph graduate student registration data

2006/2007 Outcome:

The College's D.V.Sc. program had 24 VCEP funded positions, (based on 2/3 VCEP, 1/3 MTCU agreed split) with the remainder funded from other sources. Table 2.5.6-2 includes D.V.Sc. graduates for period May 1, 2006 to April 30, 2007.

TABLE 2.5.6.2 D.V.SC. GRADUATE STUDENT PLACEMENTS 2005/2006

Department	Discipline	Graduate Placement
Pathobiology	Avian	Continuing graduate work in PhD Program
	Anatomic Pathology	Working in Pathology Division, Charles River Laboratories, Quebec
		Working in Australia
	Clinical Pathology	Yet to find permanent work, doing pathology work in the department at OVC
	Zoo Medicine	Medical Physician and part-time emergency zoo veterinarian
	Laboratory Animal	Research Associate Director, Centre for Phenogenomics, Toronto, Ontario
	Comparative Pathology & Other	Research Associate, Sick Kids, Toronto
Clinical Studies	Anesthesiology	Yet to find work
		Staff Anesthesiologist, OVC
	Companion Animal	Veterinary Emergency and Specialty Clinic, Mississauga
		Yet to find work (X2)
		ACVS Certified Surgeon in Private Practice, Toronto
		Private Practice, Mississauga
	Large Animal	PhD Program, Ohio
		Unknown
		Private Practice, Wisconsin
	Cardiology & Radiology	Veterinary Emergency and Referral Clinic, Toronto
		Unknown
		Referral Practice, California
Population Medicine		Post-Doctoral Fellow, OVC
	Health Management	Employee of Population Medicine, OVC
	Theriogenology	Alberta Agri. Food and Rural Development, Edmonton

Table includes all graduate placements for the period May 1, 2006 to April 30, 2007.

3. LABORATORY SERVICES DIVISION

3.1 Introduction

The Laboratory Services Division (LS) provides testing and diagnostic services to public and private clients in the agriculture, food and veterinary industries. Each year, more than half of the testing/services provided by LS is the result of the OMAFRA-University of Guelph Partnership Agreement. Under this agreement, LS provides testing/services for the Food Safety and Environment Division of OMAFRA. The Agriculture and Food Lab (AFL) provides agricultural/food testing for the Food Inspection Branch and diagnostic services for the Economic and Development Division. The Animal Health Lab (AHL) of LS provides a disease surveillance program for Animal Health and Welfare Branch. This program is based on a passive submission system where the actual number of tests is not defined but a target volume of cases has been established.

The above testing/services provided by LS support a number of provincial regulatory acts including the **Milk Act**, the **Farm Products Grades and Sales Act**, and the **Food Safety and Quality Act (2001)**.

3.2 Highlights

International Pet Food Recall 2007

- Lab Services responded quickly to public concern and played an important role in the Menu Foods Pet Food Recall crisis in 2007. Drawing upon a combination of scientific expertise from the Animal Health Lab (clinical and anatomic pathology) and the Agriculture and Food Lab (analytical chemistry and microscopy), LS was able to put together an impressive investigative team. This team participated in teleconferences and the sharing of information about the outbreak with colleagues from the US Food and Drug Administration and various US veterinary colleges.
- The result of the LS investigation: the common renal toxins were quickly ruled out, melamine and cyanuric acid were identified in pet food and wheat gluten, and most notably, combining these two compounds was found to result in the formation of crystals similar to the crystals found in the urine and/or tissue of animals that had died of renal failure. This was an important observation that provided some insight into how two compounds that were not thought to be dangerous might be toxic when combined.
- Many hours were spent by LS staff on this investigation and in media briefings. Key staff were freed up to devote their expertise to this investigation. The investigation was undertaken by LS, without the expectation of compensation. In situations like this, where “public good” has been impacted, staff of LS feel it is their mandate and duty to intercede and resolve problems, to the best of their ability. LS staff were also prepared to investigate a possible threat to livestock and human health when melamine was found in pig feed in the US.

Division

- Liaison relationships established in 2005/06 have resulted in improved communication between OMAFRA and LS in 2006/07. Consequently; the In Year Change process was much smoother than in previous years. Continuous improvement remains a key focus for Laboratory Services in dealing with OMAFRA
- Our annual client survey was sent to 71 AHL clients only in 2006/07 with a return rate of 48%. The survey found that 100% of the clients of AHL were satisfied with the service provided (26% were delighted). In 2007/08 the clients of Agriculture and Food Lab (AFL) at 95 Stone will be surveyed.
- Design and implementation of the new AHL laboratory information management system (LabVantage Sapphire LIMS) involved OMAFRA, OVC, and external clients. Go-live date was May 7, 2007. Service improvements will occur through Web-based submissions and reporting, and through increased efficiencies in laboratory processes. The Sapphire LIMS is a Web-based version of the same system that was implemented in the 95 Stone Road facility (95S) in 2001/02. The 95S Sapphire LIMS will be updated / upgraded in 2007/08 after the completion of the AHL implementation.
- The Animal Health Lab performed approximately 662,000 procedures (one or more test per procedure) in support of disease surveillance while the laboratories at 95 Stone Road performed 929,000 tests in support of regulatory programs. Each test generated a reportable result.

Animal Health

- Planning is proceeding for the new OVC facility that the new Animal Health Lab will be housed in. The new building will be located on Gordon Street between the main OVC building and the Food Science building.
- The AHL continues to be a partner in the CFIA-led Canadian Animal Health Surveillance Network (CAHSN), which provides local testing for agents of foreign animal diseases (FADs; e.g., foot and mouth disease, classical swine fever), computer links to a national database, and links to public health through the Canadian Public Health Infrastructure (CNPHI).
- The AHL continues to test wild birds and domestic poultry for avian influenza virus, and is a participant in the CFIA-sponsored Avian Influenza Laboratory Network and the Ontario Avian Influenza Working Group.
- The AHL continued as a partner in the programs being developed by the proposed new Ontario Agency for Health Protection and Promotion, particularly in the areas of zoonotic disease surveillance and surge capacity.
- Ongoing important testing conducted by the AHL is the testing for various transmissible spongiform encephalopathies (TSE) including BSE, CWD and scrapie. The AHL as a member of the CFIA-sponsored TSE Laboratory Network.
- In 2006/07 the Swine industry continued to deal with the negative impact of two serious disease outbreaks affecting swine, PRRS and PCVAD. The AHL works closely with swine veterinarians and industry to deal with these diseases.
- The AHL informed OMAFRA of 125 reportable or notifiable disease events that were suspected and/or confirmed in Ontario in 2006/07, ranging from anthrax through influenza, and participated in the investigation of various disease outbreaks.

Agriculture and Food

- Laboratory Services provided immediate, emergency analytical support to OMAFRA staff on a number of high-priority investigations that were conducted during 2006/07.
- LS made a concerted effort in 2006/07 to address the ongoing demands for increasing scope of analytes and detection limits, primarily for OMAFRA. At the Agriculture and Food Lab (AFL) at 95 Stone, two separate Method Development work groups were established, to work specifically on new methods. As a result 51 new methods were brought on line.
- In continuing to collaborate with the CFIA, LS was a successful bidder in the RFP for “National Standing Offer for Testing of Chemical Residues in Food”, joining a list of approved labs. Much of the method development mentioned above was beneficial in this process.
- LS continued to respond to the needs of OMAFRA and other clients, for more rapid methodology in microbiology testing, e.g. BAX and GDS (PCR methods for rapid detection of microbial pathogens). The shorter turn-around time provided by these methodologies allows more rapid response to the potential risks to public health posed by these microbial pathogens. These tests have generated interest from industry (for export) and government (CFIA).
- LS expanded its services and client base in the Immunochemistry section. This area provides ELISA based testing for drug and other chemical residue screening for OMAFRA, industry and other government bodies. ELISA testing offers economical benefits through high volume batch efficiencies.
- Molecular methods were expanded to provide genetic identification/confirmation in foods of plant and animal origin (e.g. Yukon Gold potatoes).
- LS acquisition of an ICP-MS instrument will provide OMAFRA with detection of heavy metals and elements at the lowest possible levels and be congruent with the national food testing program (CFIA).
- During 2006/07, LS continued to expand the number of individual test methods that are accredited to an ISO/IEC 17025 standard to meet changing client needs. This is always a major undertaking and 14 new tests were accredited. In total 163 tests are now accredited to the ISO/IEC 17025 standard, predominantly in the AFL.
- The 2006/07 Plum Pox Virus (PPV) project marks the 6th year of this collaborative effort involving CFIA, Agricorp, OMAFRA and LS to eradicate PPV in Ontario.

3.3 Budget

Under the terms of the OMAFRA/UofG Agreement, the Laboratory Services Division receives funding for the specific testing services described previously. In addition, LS is required to earn sufficient additional income to replace and upgrade its infrastructure. To that end, LS provides testing, on a fee-for-service basis, to various clients in the public and private sector. It is estimated that LS must reinvest at least \$1.5 million per year in infrastructure replacement and upgrades in order to maintain the current level of capabilities to meet OMAFRA's testing requirements. This does not cover the needs for expansion of testing capabilities to deal with emerging problems and regulatory requirements. As needs evolve, additional investment is required to acquire the new technology to meet increasingly complex test requirements.

Financial Results for year ended April 30, 2007

Funding, Revenue & Expenditures (\$ in millions)	Actual 05/06	Actual 06/07
Expenditures		
Animal Health Lab	\$6.7	\$7.7
Analytical Services	4.8	4.8
Regulatory Services	3.8	4.1
I & S ⁽¹⁾	3.0	3.6
Reinvestment	1.6	2.5
Total Expenditures	\$19.9	\$22.7
Revenue (external clients only)	12.0	11.9
OMAFRA Funding	9.0	9.0
Carry forward surplus & other funding	1.7	2.8
Total Funding & Revenue	\$22.7	\$23.7
Surplus/(Deficit)	\$2.8	\$1.0

⁽¹⁾ Infrastructure and Support

- External revenues decreased slightly in 2006/07 to \$11.9 million, compared to \$12.0 million in 2005/06.
- The AHL had an increase in external revenue of \$0.5 million in 2006/07 vs. previous year which was offset by a decrease in PPV revenue of \$0.6 million.
- Total expenditures were up \$2.8 million over 2005/06 due to higher reinvestment of \$0.9 million and other expenses relating to improvement programs initiated in 2006/07 (see Managing Director section of 3.2 above)
- Reinvestment in infrastructure and capabilities was \$2.5 million in 2006/07. This represented the 7th consecutive year that LS has reinvested at least \$1.5 million back into the lab. The total reinvestment in the last 7 years is \$16.0 million or an average of \$2.29 million per year.

3.4 Reinvestment (\$'000's)

The table below details key reinvestments made in 2006/07. A detailed inventory of equipment including all new acquisitions is submitted to OMAFRA on a yearly basis. Major acquisitions are noted in the table.

Reinvestment Item	Amount (in million's of dollars)
LIMS * system (AHL)	\$1.06
Chemistry Method development - AFL	0.63
Gas Chromatograph – AFL	0.09
FTIR Spectrometer - AFL	0.09
Sterilizer - AFL	0.08
LIMS - AFL	0.05
Other (less than \$50,000)	0.50
Total	\$2.5

* LIMS – Laboratory Information Management System

3.5 Improvement Projects

The largest improvement project for LS in 2006/07 was the AHL LIMS system. Late in 2004/05 the decision was made to replace the previous system VADDS. In 2005/06 the selection process was completed and Sapphire LIMS was chosen as the system to replace VADDS. The software was purchased in 2005/06 and the implementation was started late in 2005/06 and was mostly completed in the 2006/07 fiscal year - go-live date was May 7, 2007. The costs incurred in 2005/06 were \$0.6 million and another \$1.1 million was spent in 2006/07. The Sapphire LIMS implemented in the AHL is a newer version of the same system that was implemented in 2001/02 at 95 Stone Road.

The testing requirements for OMAFRA and other clients continue to evolve at a rapid pace. In order to meet OMAFRA/client needs LS continues to put a significant portion of its improvement effort into developing and maintaining the tests required. Examples of the activities required are:

- the ongoing development of new PCR based tests in the AHL
- the development of more rapid test to meet shorter turn around time requirements
- the requirement to accredit more tests to an ISO 17025 standard
- new DNA based services

See the highlights section 3.2 for more detail on the above improvement activities.

3.6 Accommodation and Planned Upgrades

Bio-security continues to be serious concern for the AHL, especially in light of emerging foreign animal diseases such as Avian Influenza. This concern will be key issue in the planning of a new shared facility for AHL and the Department of Pathobiology. Since the new building will not be occupied until 2010, LS undertook an interim measure by renovating the necropsy suite in the AHL to enhance biosecurity. The renovation was completed in 2006/07, and involved moving the avian necropsy suite to the former wildlife suite, installing HEPA-filtered exhaust air, and renovating the former avian suite into a freezer room and PM anteroom.

The HVAC system repair at 95 Stone Road was completed in 2006/07.

3.7 Quality Assurance

Laboratory Services maintained registration to the ISO 9001:2000 quality standard and expanded it to include the AHL Kemptville laboratory. LS quality system was upgraded to meet the requirements of the new 2005 version of ISO/IEC 17025 standard. LS expanded the Standard Council of Canada scope of accreditation; thirteen new tests were added. The water microbiology lab maintained the Ontario drinking water test license. The GLP status of the pesticide laboratory was confirmed.

The Animal Health Laboratory maintained American Association of Veterinary Laboratory Diagnosticians' accreditation for full service. This accreditation is additional to the ISO status mentioned above

3.8 Research Innovation & New Capabilities

3.8.1 Innovation

The Laboratory Services Division is a service organization that provides laboratory services; as such, innovation for LS means improving processes (see 3.5 above) and developing new testing methods.

In the midst of all the recognized testing and diagnostic services, Lab Services' scientists are actively engaged in the pursuit of research programs, many of which underpin the development of new testing and surveillance capacity.

3.8.2 New Capabilities

Lab Services is continually updating and developing new testing methods to meet the emerging needs of OMAFRA and other clients. The following new methods were introduced during 2006/07.

New Microbiological Test Required for OMAFRA and/or Service Work (2006/07)

MID-216	(MFLP-16) Detection of <i>Escherichia coli</i> O157:H7 in foods – Assurance GDS™ for <i>E. coli</i> O157:H7 Gene Detection System
MID-217	(MFLP-29) the Qualicon BAX® System for the Detection of <i>Salmonella</i> in a Variety of Food
MID-218	(MFLP-36) Detection of <i>Salmonella</i> in Food and Environmental Surfaces - Assurance GDS™ for <i>Salmonella</i> Gene Detection System
MID-219	(MLG-4C.01) FSIS Procedure for the Use of the BAX System PCR Assay for Screening, <i>Salmonella</i> in Raw Meat, Carcass Sponge Samples, Whole Bird Rinses, Ready-to-Eat Meat and Poultry Products and Pasteurized Egg Products.
MID-220	(MFLP-30) the Dupont Qualicon BAX® System for the Detection of <i>E.coli</i> O157:H7 in Raw Beef and Fruit Juice
MID-047	Training in Basic Microbiology Techniques
MID-048	Risk-based Verification Sampling of Ready-to-Eat (RTE) Meat and Poultry Products ver 1.0 CFIA -Food Microbiology and Chemical Evaluation
MID-196	Enumeration of <i>Staphylococcus Aureus</i> in Foods and Environmental Samples using 3M Petrifilm Staph Express Count (STX) Plates (MFLP-21)
MID-199	Confirmation Steps for Methods for the Detection of <i>Listeria</i> Spp. in Foods and Environmental Samples (HPFB supplement)
MID-206	Isolating viable thermophilic <i>Campylobacter</i> from meat and poultry samples
MID-207	<i>Yersinia enterocolitica</i> and <i>Yersinia pseudotuberculosis</i> (FDA Chapter 8)
MID-211	Isolation of <i>Yersinia Enterocolitica</i> and Other <i>Yersinia</i> Spp.(MFLP-48)
MID-212	Handling & Detecting for <i>E. coli</i> O157:H7 in Meat Samples by GDS PCR Method
MID-213	Enumeration of Coliforms, Faecal Coliforms and of <i>E.coli</i> (MFO-23)
MID-214	Isolation of Thermophilic <i>Campylobacter</i> from Food (MFLP-46)

New Trace Organic and Pesticides tests for Service Work (2006/07)

TOPS-103	(based on SPR-005-V1.4) Thiaibendazole in Apples and Pears by HPLC-UV
TOPS-114	(based on CFIA P-RE-057-97(1)-AMO) Daminozide in Apples by GC-ECD
TOPS-121	(based on CFIA P-RE-060-97 (1)-ETU) Ethylenethiourea by HPLC
TOPS-122	(based on CFIA CSP-006 V1.0) Amitraz in Pears by GC-ECD
TOPS-123	(based on CFIA SPR-003-v1.2) Benomyl in Fruits and Vegetables by HPLC
TOPS-124	(based on CFIA SPR-002-V2.4) EBDC in Frutis and Vegetables by HPLC-fluorescence
TOPS-125	(based on CFIA SPR-001-V1.4) Formetanate by HPLC
TOPS-126	(based on CFIA PMR-0020v1.1) Pesticides in Honey, Fruit Juices and Wine with solid phase extraction clean-up by GC/MSD and HPLC Fluorescence
TOPS-127	(based on CFIA PMR-001-V1.4) Pesticides in Fruits and Vegetables (with Solid Phase Extraction Clean-up and GC/MSD and HPLC Fluorescence Detection)

TOPS-129 Polycyclic Aromatic hydrocarbons (PAHs) using GC-MSD
TOPS-130 Ethyl Carbamate (Urethane) in Alcoholic Beverages by GC-MS

New Drug Residue Tests for OMAFRA Testing (2006/07)

DRUGS-131 CHARM II Sulfa Drug Test for Honey

New Food Chemistry Tests Introduced for Service Work (2006/07)

FC-144 Salt in Butter (AOAC method 960.29)

New Chemical Residue Tests Introduced for OMAFRA Testing (2006/07)

TOXI-059 Lead, Cadmium, Zinc, Copper, and Iron in Foods (AOAC 999.10)

TOXI-061 Determination of Trichothecene Mycotoxins in Feed and Feed Ingredients by
Gas Chromatography with Ion-Trap Mass Spectrometer Detection using
Acetonitrile Chemical Ionization

New Environmental Tests for Service Work (2006/07)

SNL-047 Total, Fixed, and Volatile Solids in Solid and Semisolid Samples

SNL-048 Total Dissolved Solids Dried at 180C

SNL-113 Suspended Sediment in Surface Water

New Tests in Molecular Biology (2006/07)

MOL-035 PCR Detection of Campylobacter

MOL-036 PCR Detection of Salmonella

MOL-037 PCR Detection of Shigella

MOL-038 PCR Detection of Legionella pneumophila

MOL-039 DNA Fingerprinting Using Microsatellite Analysis

MOL-041 ABI 7000 Sequence Detection System

MOL-042 ELISA-TEK Cooked Meat Speciation Kits

MOL-187 ReVeal for Ruminant in MBM

MOL-188 ReVeal for Ruminant in Feed

MOL-189 DNA Purification from Liquid Samples (AHL)

MOL-190 DNA/RNA Extraction-Feces (AHL)

MOL-191 RNA Isolation From Semen MagMax™ (AHL)

MOL-192 Mycoplasma iowae RAPD typing (AHL)

MOL-193 DNA Extraction from Agarose Gels (AHL)

MOL-194 TURBO DNase Treatment Protocol (AHL)

MOL-195 General Procedures for PCR, RT-PCR, real-time PCR, and real-time RT-PCR

MOL-196 PRRSV Tetracore NA-EU Real -Time RT-PCR

MOL-197 Mycoplasma iowae Real-Time PCR

MOL-198 Plant Species ID Determination by DNA Sequencing

PDC-114 DNA Multiscan®

New Food Animal Operating Procedures Introduced by the AHL (2006/07)

IAV-AV480 Avian Influenza: Competitive Enzyme-Linked Immunosorbent Assay for the
Detection of Antibodies to Avian Influenza Virus Version 3.0

TOXI-057 Ethylene Glycol Test Kit

MMV-337 Canine Influenza Virus Hemagglutination Inhibition

MMV-338 3ABC Competitive Enzyme-Linked Immunosorbent Assay for Detection of
Antibodies to Foot and Mouth Disease Virus

MMV-339 Procedure for use of SpectraMax 340 ELISA Plate Reader

3.9 Performance Measures

Service Details	Performance Measures and Targets	Comments
A. Animal Health		
1. Policy Development	OMAFRA determined needs for policy development and set / confirmed direction for disease surveillance, with input from LS as required OMAFRA informed LS of this direction annually and as soon as a change in direction was known to OMAFRA	As the lead agency in the Ontario Avian Influenza Working Group, OMAFRA supported increased capacity of the AHL to provide high-volume AIV testing should a highly pathogenic AIV outbreak occur. Yes.
2. Laboratory Management	LS managed resources, provided the required services and maintained scientific capacity at a level appropriate to OMAFRA needs while remaining within the funding allocation. LS maintained its AAVLD accreditation and ISO registration, and reported status to OMAFRA annually and immediately upon failing to maintain accreditation or registration. LS reported client service survey results from livestock, poultry and OMAFRA veterinarians to OMAFRA annually. In the annual client service survey, 90% of responding livestock, poultry and OMAFRA veterinarians judged LS performance as acceptable or better.	Yes, the AHL staffing complement was maintained at 16 veterinary specialists, 55 technical staff, and 5 clerical staff, plus ~20 FTE of part-time staff, for a total of ~96 FTEs. Yes, the AHL underwent an AAVLD site visit in Sept/04, and was granted full accreditation, all species, for 5 years, effective July/05, with no limitations. Yes, via the Nov 2006 annual client survey. Yes, all respondents were satisfied with AHL service, and 26% were delighted. All respondents will continue to use our services.

Service Details	Performance Measures and Targets	Comments
3a. Services	LS provide OMAFRA with expected costs for services for animal health diagnostic priorities by April 30 each year. LS and OMAFRA collaborated to meet passive animal disease surveillance program objectives and remain within the funding allocation LS had no significant service failures that threaten the integrity of the database for passive surveillance. LS recorded and tracked service non-conformances as per ISO standards and reported to OMAFRA quarterly.	Yes, as noted in Schedule K mtgs. Yes. Correct. Yes.
3b. In-year Changes to Services	LS submitted revised service costs within 4 weeks of receiving requests for in-year changes OMAFRA and LS were satisfied that in-year changes were handled appropriately and followed the defined procedures as set out in the Information Management Protocol.	Yes; 1 "In-year change" in 2006/07. Yes, see above.
3c. Emergency Preparedness	OMAFRA and LS worked with CFIA and other agencies to begin the development of an emergency preparedness plan.	Emergency preparedness plans in place.
4. Maintain Accessibility	OMAFRA and LS discussed priorities and issues related to accessibility and identified potential solutions to problems, quarterly.	Yes. Continued follow up/discussion of actions taken in 2005/06 to improve compliance with submission of demographic information.

Service Details	Performance Measures and Targets	Comments
	LS delivered services in a manner which encouraged veterinarians to submit laboratory diagnostic submissions.	Maintained coverage of western and northern Ontario through the Guelph lab and eastern Ontario through the Kemptville lab.
5. Development of New Test Methodologies	LS introduced new tests as required.	Enhanced existing tests and added new tests, particularly in the PCR and IHC areas, and updated client veterinarians through the quarterly AHL Newsletter.
6. Professional Expertise	LS maintained the scientific quality of its animal health diagnostic laboratory as demonstrated by continued accreditation by AAVLD.	Yes, see 2. above.
7a. Reporting - Client Reports	OMAFRA veterinary scientists analyzed data and reported provincial disease trends to Ontario livestock and poultry sectors as appropriate. LS client service survey showed 90% of livestock and poultry veterinarians judged reporting as acceptable or better.	Yes. Yes, as recorded in the Nov 2006 annual client survey. AHL results are also now available via the Web.
7b. Third Party	OMAFRA communicated test results to third parties as appropriate. LS obtained written permission from primary clients to communicate any test results to third parties.	Yes. Yes.
7c. Reportable Disease	OMAFRA communicated information about reportable, notifiable and significant disease incidents to the livestock sector and the public as appropriate.	Yes.

Service Details	Performance Measures and Targets	Comments
	LS informed the provincial veterinarian and/or CFIA of reportable, notifiable or significant disease incidents immediately.	Yes, the AHL informed OMAFRA of 125 disease events in Ontario in 06/07, ranging from anthrax through influenza.
8. Information Management	LS submitted a summary of testing results annually and as required LS provided OMAFRA with on-line access to the diagnostic testing conducted at the AHL LS maintained raw data for 7 years OMAFRA and LS discussed IT systems appropriate for data collection and transfer and disease surveillance, as was warranted	Yes, annual Labstat (cases/procedures) report submitted, plus ad hoc searches. Yes, through SQL searches of the VADDS database. Yes Yes, consulted with OMAFRA regarding design of the new AHL LIMS (Sapphire) and data warehouse to ensure capture and storage of required information.
9a. Communications-Service Issues	OMAFRA and LS were satisfied that all incidents were communicated and dealt with appropriately.	Yes.
9b. Dispute Resolution	LS recorded service non-conformances and initiated follow-up procedures as required to maintain ISO registration OMAFRA and LS were satisfied that issues were resolved and steps were taken to prevent further issues.	Yes. Yes.
9c. Outreach	OMAFRA and LS implemented a mutually agreed upon approach for outreach to vets and industry.	Yes, both groups maintained active participation in a full range of veterinary and commodity organizations, e.g., OAPP, OABP, OASV, PIC, OPIC, OSHAB.

Service Details	Performance Measures and Targets	Comments
9d. Meetings	OMAFRA and LS participated in meetings and were satisfied with the frequency and quality of them.	Yes, internal quarterly Schedule K mtgs attended, and ad hoc mtgs as required, plus external mtgs with OPIC, etc.
10. Other Services	OMAFRA obtained separate and distinct agreements and sources of funding for additional services from LS. LS provided additional services as agreed upon with OMAFRA.	Yes Yes, AIV testing and BSE testing.
11. Investment in Infrastructure	LS demonstrated that infrastructure or capabilities improvements were achieved through re-investment over the previous year, and reported improvements and improvement plans to OMAFRA annually.	Yes, \$1.1 million was invested in the new AHL LIMS in 2006/07.
12. Schedule "K"	OMAFRA and LS goals and objectives were met and reported annually.	Yes, through quarterly and ad hoc meetings, and annual Labstat report of cases and procedures by animal species.
13. PMA Performance Measure and Target Development	LS and OMAFRA agreed on changes to performance measures and targets for animal health diagnostic services by June 30 each year.	Revisions to the PMAs are on hold until 2008.
B. Plants, Soil and Water		
1. Program Management	OMAFRA determined needs for policies and programs annually, and obtained input from LS as appropriate.	The LS Schedule K Liaison position and the OMAFRA Laboratory Analyst continue to foster a synergistic approach to obtaining appropriate input from all parties.

Service Details	Performance Measures and Targets	Comments
2. Laboratory Management	LS managed resources, provided the required services and maintained scientific capacity at a level appropriate to OMAFRA needs while remaining within the funding allocation. LS maintained ISO registration and critical accreditations, and reported status to OMAFRA annually and immediately upon failing to maintain registration, accreditation or certification.	LS worked successfully with OMAFRA to meet the challenge of significant in-year-changes to testing programs. In-year changes not required for PSW. LS maintained all reg'n, accreditations & certifications: • ISO 9000 : 2001 Registered • Canadian Assoc. of Environmental Analytical Laboratories (CAEAL) - currently accredited to a 17025 standard for 27 environmental tests • * Standard Council of Canada (SCC) - currently accredited to a 17025 standard 163 tests E.g. MOL-198 Plant Species ID Determination by DNA Sequencing PDC-114 DNA Multiscan® All of the New Chemical Residue Tests Introduced for OMAFRA Testing (2006/07) e.g. pesticides, metals and toxins can apply to the Great Lake water testing and vegetation investigations (see above).
3a. Program Sampling Plans - Development	OMAFRA submitted testing specifications to LS by March 1 each year. LS submitted tests costs to OMAFRA by April 30 each year if OMAFRA met the March 1 deadline. OMAFRA and LS kept the costs of the plan within the allocation provided under the transfer payment and reported results annually. LS followed the testing methodology as agreed upon with OMAFRA.	Yes Deadline extension met. The testing requested under Sch K exceeded \$9.0 million. LS agreed to expand testing services to \$9.1 million to cover off the extra testing. LS worked collaboratively with OMAFRA to establish testing methodology to be used. PDC-114 DNA Multiscan®

Service Details	Performance Measures and Targets	Comments
3b. In-year Changes to Plan	LS submitted revised test costs to OMAFRA within 4 weeks of receiving requests for in-year changes OMAFRA and LS were satisfied that in-year changes were handled appropriately.	Yes Yes
3c. Additional Samples	LS notified OMAFRA 2 to 4 weeks before sample test numbers were projected to reach 95% of sample plan #'s agreed upon in the sampling plan. OMAFRA provide funds to cover LS costs resulting from requested samples that exceeded plan cost limits.	Yes LS agreed to absorb excess costs.
4a. Sample Collection	OMAFRA and LS agreed upon criteria for sample submission quality. OMAFRA followed protocols to ensure that sample quality, with a result that LS reported on an annual basis no more than 1.0% of incoming samples as significant non-conforming. LS notified OMAFRA immediately after receiving significant non-conforming samples.	Yes Sample quality was a consistent issue throughout the year. This is an inherent challenge due to the nature of the perishable goods involved in this program. Yes
4b. Sample Testing	LS recorded and tracked service non-conformances as per ISO standards, and reported in quarterly reports to OMAFRA. Non-conformances did not exceed 1.0% of test results reported. Non-conformances were calculated independently for each program area on an annual basis.	LS continues to use Lab Track, its quality non-conformance tracking database, to enhance the problem solving process and result in the overall improvement of services. Yes

Service Details	Performance Measures and Targets	Comments
4c. Sample Numbers	LS advised OMAFRA when sample submissions and testing deviated 5% from the sampling plan.	Yes
4d. Information Management	OMAFRA and LS maintained information for 7 years. LS maintained its own database following ISO standards. OMAFRA and LS were satisfied that information was managed according to established protocols.	Yes Yes Yes
4e. Reporting Test Results	LS provided reports in the required format and within the agreed upon time frame. LS followed protocols for isolates/samples transfers to cooperating laboratories. LS informed OMAFRA immediately on obtaining results indicating public health hazards. OMAFRA and LS were satisfied with the communication and protocols developed for test result reporting.	Yes N/A Yes Yes
4f. Action on Test Results	OMAFRA took action on test results according to established protocols.	LS assumes that OMAFRA complied with this PMA.
5a. Communications - Service Issues	OMAFRA and LS were satisfied that all incidents were communicated and dealt with appropriately.	Yes

Service Details	Performance Measures and Targets	Comments
5b. Dispute Resolution	LS recorded service non-conformances and initiated follow-up procedures as required to maintain ISO registration. OMAFRA and LS were satisfied that issues were resolved and steps were taken to prevent further issues.	Please refer to Lab Track comment in 4b. above. No issues reported for PSW program this fiscal year.
5c. Third party	OMAFRA and LS were satisfied that communications with third parties were dealt with appropriately.	Yes
5d. Meetings	OMAFRA and LS participated in meetings and were satisfied with the frequency and quality of them.	Yes
6. Other Services	OMAFRA obtained separate and distinct agreements and sources of funding for additional services from LS. LS provided additional services as agreed upon with OMAFRA.	Yes Yes. Implementation of DNA MultiScan over traditional methodology; 12% overrun in Nematode testing.
7. Investment in Infrastructure	LS demonstrated that infrastructure or capabilities improvements were achieved through re-investment over the previous year, and reported improvements and improvement plans to OMAFRA annually.	E.g. Method Development- 51 new methods; 14 methods accredited to ISO 17025 DNA MultiScan Pesticide Methods
8. Schedule "K"	OMAFRA and LS goals and objectives were met and reported annually.	Yes

Service Details	Performance Measures and Targets	Comments
9. PMA Performance Measure and Target Development	LS and OMAFRA agreed on changes to performance measures and targets for Plants, Soil and Water Laboratory Program by June 30 each year.	The current PMA's have been in place since 2003/2004 fiscal year and will remain so until renegotiation in 2008.
C. FOOD		
1. Program Management	OMAFRA determined needs for policies and programs annually, and obtained input from LS as appropriate.	The LS Schedule K Liaison position and the OMAFRA Laboratory Analyst continue to foster a synergistic approach to obtaining appropriate input from all parties.
2. Laboratory Management	LS managed resources, provided the required services and maintained scientific capacity at a level appropriate to OMAFRA needs while remaining within the funding allocation. LS maintained ISO registration and critical accreditations, and reported status to OMAFRA annually and immediately upon failing to maintain registration, accreditation or certification.	LS worked successfully with OMAFRA to meet the challenge of significant in-year-changes to testing programs. LS maintained all reg'n, accreditations & certifications: • ISO 9000 : 2001 Registered • Canadian Assoc. of Environmental Analytical Laboratories (CAEAL) - currently accredited to a 17025 standard for 27 environmental tests • Standard Council of Canada (SCC) - currently accredited to a 17025 standard 163 tests Methods can be applied to several programs and matrices; specific applications also run through accreditation for Testing Method Development and Evaluation and Non-Routine Testing. List is too onerous to include here. This is also not new information to OMAFRA. Scopes of accreditation are posted to the internet.
3a. Program Sampling Plans - Development	OMAFRA submitted testing specifications to LS by March 1 each year.	Yes

Service Details	Performance Measures and Targets	Comments
	LS submitted tests costs to OMAFRA by April 30 each year if OMAFRA met the March 1 deadline. OMAFRA and LS kept the costs of the plan within the allocation provided under the transfer payment and reported results annually. LS followed the testing methodology as agreed upon with OMAFRA.	Deadline extension met. The testing requested under Sch K exceeded \$9.0 million. LS agreed to expand testing services to \$9.1 million to cover off the extra testing. LS worked collaboratively with OMAFRA to establish testing methodology to be used.
3b. In-year Changes to Plan	LS submitted revised test costs to OMAFRA within 4 weeks of receiving requests for in-year changes OMAFRA and LS were satisfied that in-year changes were handled appropriately.	Yes Yes
3c. Additional Samples	LS notified OMAFRA 2 to 4 weeks before sample test numbers were projected to reach 95% of sample plan #'s agreed upon in the sampling plan. OMAFRA provide funds to cover LS costs resulting from requested samples that exceeded plan cost limits.	Yes LS agreed to absorb excess costs.
4a. Sample Collection	OMAFRA and LS agreed upon criteria for sample submission quality. OMAFRA followed protocols to ensure that sample quality, with a result that LS reported no more than 0.1% of incoming samples as significant non-conforming in quarterly reports to OMAFRA.	Yes Sample quality was a consistent issue throughout the year. This is an inherent challenge due to the nature of the perishable goods involved in this program.

Service Details	Performance Measures and Targets	Comments
	LS notified OMAFRA immediately after receiving significant non-conforming samples.	Yes
4b. Sample Testing	LS recorded and tracked service non-conformances as per ISO standards, and reported in quarterly reports to OMAFRA. Non-conformances did not exceed 1.0% of test results reported. Non-conformances were calculated independently for each program area on an annual basis.	LS has improved Lab Track, its quality non-conformance tracking database, this will enhance the problem solving process and result in the overall improvement of services. Yes
4c. Sample Numbers	LS advised OMAFRA when sample submissions and testing deviated 5% from the sampling plan.	Yes
4d. Information Management	OMAFRA and LS maintained information for 7 years. LS maintained its own database following ISO standards. OMAFRA and LS were satisfied that information was managed according to established protocols.	Yes Yes Yes
4e. Reporting Test Results	LS provided reports in the required format and within the agreed upon time frame. LS followed protocols for isolates/samples transfers to cooperating laboratories. LS informed OMAFRA immediately on obtaining results indicating public health hazards.	Yes N/A Yes

Service Details	Performance Measures and Targets	Comments
	OMAFRA and LS were satisfied with the communication and protocols developed for test result reporting.	Yes
4f. Action on Test Results	OMAFRA took action on test results according to established protocols.	LS assumes that OMAFRA complied with this PMA.
5a. Communications - Service Issues	OMAFRA and LS were satisfied that all incidents were communicated and dealt with appropriately.	Yes
5b. Dispute Resolution	LS recorded service non-conformances and initiated follow-up procedures as required to maintain ISO registration. OMAFRA and LS were satisfied that issues were resolved and steps were taken to prevent further issues.	Please refer to Lab Track comment in 4b. above. A single incident occurred in Q2 from a change in required reporting format in the Plants of Food Origin Program resulting in an overall Corrected Reports incidence of 1.5%.
5d. Meetings	OMAFRA and LS participated in meetings and were satisfied with the frequency and quality of them.	Yes
6. Other Services	OMAFRA obtained separate and distinct agreements and sources of funding for additional services from LS. LS provided additional services as agreed upon with OMAFRA.	Yes Yes. E.g. PAHs in meat, adulteration of maple syrup, genetic confirmation of plant variety identification e.g. Yukon Gold Potatoes.

Service Details	Performance Measures and Targets	Comments
7. Investment in Infrastructure	LS demonstrated that infrastructure or capabilities improvements were achieved through re-investment over the previous year, and reported improvements and improvement plans to OMAFRA annually.	Yes, E.g. Method Development- 51 new methods; 14 methods accredited to ISO 17025 Please refer to the list of methods under 3.8.2 New Capabilities above. E.g. All pesticide in vegetation methods (TOPS), TOXI methods, MID methods listed.
8. Schedule "K"	OMAFRA and LS goals and objectives were met and reported annually.	yes
9. Dairy	OMAFRA negotiated the terms and conditions of the testing program and advised LS about changes. OMAFRA and DFO were satisfied with LS's reporting of all results to DFO. LS conducted tests required for milk quality and composition under ISO quality standards. LS ensured the integrity of samples under its control as per ISO quality standards. OMAFRA took immediate action when DFO failed to pay program costs.	Yes LS will continue to work with OMAFRA to address DFO's objectives of this program. yes yes No payment issues this fiscal year.
10. PMA Performance Measure and Target Development	LS and OMAFRA agreed on charges to performance measures and targets for Plants, Soil and Water Laboratory Program by June 30 each year.	It is our understanding that these have been in place since 2003/2004 fiscal year and will remain so until renegotiation in 2008.

4. OTHER OMAFRA/U OF G AGREEMENT PERFORMANCE MEASURES

In addition to the primary areas covered by the OMAFRA/U of G Agreement (Research, Diploma Education, Veterinary Clinical Education Program, and Laboratory Services), there are several other Performance Management Agreements (PMAs) that require reporting as part of the Annual Report. The objectives, performance measures and results for these PMAs are itemized below.

4.1 Reporting (Finance and Business)

Budget

The University must annually present the budget to OMAFRA for the Research, Diploma Education and Training, Veterinary Clinical Education Program (VCEP) and Laboratory Services programs.

Quarterly Management Reports

The University is to submit financial management reports to OMAFRA within 6 weeks after the end of each quarter for the Research, Diploma Education and Training, Veterinary Clinical Education Program (VCEP) and Laboratory Services programs. In addition, a Transfer Payment report is to be filed each time.

Business Plan

The University is to submit a business plan covering the four programs (Research, Diploma Education, VCEP, Laboratory Services) each year, encompassing a brief description of each program and sub-programs, changes required or anticipated to the program relative to the previous year, new partnerships being or to be developed, staffing changes that could impact on the deliverables under the Agreement, and facility accommodation issues. The University met this deadline in 2006/07 by submitting the draft business plan to OMAFRA on April 15th; after an extension had been granted to accommodate the submission of the budget to the U of G's Board of Governors and the completion of the Executive Financial Summary. The Business Plan was approved by the OMAFRA/UofG Executive Committee in August 2007.

Trust Funds

The University is to submit reports on the '**Post-Retirement**' and '**Non-Pension Post-Retirement**' trust funds, as well as the '**Agreement Research Trust Fund**' (formerly the 'Partnership Research Trust Fund'), along with the quarterly management reports. The University maintained compliance with this PMA in 2006/07.

Physical Facilities and Assets

This section includes PMA's pertaining to:

- Annual reporting on **space utilization and rationalization**
- Submitting budgets and reporting annually on **operations and maintenance**, and updating of Schedule T as required
- Review of facilities, including annual submission of **facility deficiency reports** and plans for addressing short, medium and long-term deficiencies.
- Reporting **sub-tenancies**, annually
- Submitting annually an **Asset Inventory and Planned Disposition Report**, detailing date of acquisition, asset value, ownership, condition, items sold, traded in or otherwise disposed of and revenues generated; intended dispositions and/or replacements for the coming year, and **livestock inventories**. With the exception of the livestock inventories (which are reported

within this Annual Report), each of these entails reporting dates other than with the Annual Report.

4.2 Emergency Preparedness / Environmental Health and Safety

Emergency Preparedness Plan (PMA #6 under Physical Facilities and Assets)

The University's Emergency Response Plan (ERP) is posted on the Security Services' web site, <http://www.uoguelph.ca/security/Police/ERP.html>. A call-out list with contact information for managerial personnel at all research stations (including animal facilities) is included with Appendix D to the University's ERP.

On May 26th, 2006, the University hosted a workshop titled *Introduction to Basic Emergency Management*. The workshop was presented by an experienced consultant who promoted concepts of emergency management as practiced in Ontario and across Canada. Senior administrative and managerial personnel attended, including personnel from the Regional Campuses. Subsequent to the course, animal facility managers were provided an emergency response plan (ERP) template (with a checklist of elements for content) so that local facility-specific emergency response plans could be reviewed, up-dated, and shared.

Environmental Health and Safety Management

The University ensures Environmental Management Plans and Health and Safety Programs are in place for all locations, covering compliance with relevant legislation, management of incidents, identification of hazards associated with the programs, record keeping and communications, with a goal of zero incidents (spills, contamination, injuries, etc.).

The University's Environmental Health and Safety (EHS) department is responsible for the development of occupational health and safety and environmental protection policies, programs and assist with the implementation of such initiatives. The University's safety policies and safety programs can be found at <http://www.uoguelph.ca/ehs/>.

The University promotes the internal responsibility system for workplace safety management and regulatory compliance. EHS personnel provide advice and services in this regard to members of the University community. In particular, front-line managers and supervisors are provided support and guidance for workplace safety performance and due diligence.

4.3 Indemnity and Insurance

The University is required to submit certificates of all types of insurance to OMAFRA at the execution of the Agreement and submit renewal certificates as needed. The University has submitted the certificates in compliance with this PMA in 2006/07.

4.4 Non-OMAFRA Funding for Infrastructure

Awards were received in 2006/07 for over \$4.27 million in non-OMAFRA funding for research infrastructure related to the OMAFRA research program objectives. A number of these funding awards were combined CFI (Canadian Foundation for Innovation), OIT (Ontario Innovation Trust) awards and matching contributions.

Description of Award	Sponsor(s)	\$ Amount
Integrated venous function in chronic heart failure. (R. Johnson, Biomedical Science)	CFI/OIT/matching	\$317 K
Research setup for active food packaging systems, biodegradable material forming and food-packaging interaction. (L-T. Lim, Food Science)	CFI/OIT/matching	\$211 K
Sustainable Pest Management in field and horticultural crops. (P. Sikkema, Ridgetown Campus/OAC)	CFI/OIT/matching	\$951 K
Facility for nutraceutical encapsulation and performance. (A. Wright, Human Health & Nutritional Science)	CFI/OIT/matching	\$317 K
Protein structural biology facility. (S. Graether, Molecular and Cellular Biology)	CFI/OIT/matching	\$629 K
Infrastructure to enhance turfgrass research. (K. Jordon/E. Lyons, Plant Agriculture)	CFI/OIT/matching	\$617 K
Infrastructure to improve the resistance of livestock to infectious disease. (A. Brooks, Pathobiology)	CFI/OIT/matching	\$289 K
Infrastructure support for investigating biological diversity at the genomic level, characterizing biodiversity at the species level and enhancing future biodiversity and genomic research. (R. Gregory/B. Hanner, Integrative Biology)	CFI/OIT/matching	\$626 K
Understanding the cellular regulatory processing governing starch biosynthesis in plants. (I. Tetlow, Molecular and Cellular Biology)	CFI/OIT/matching	\$309 K
Total		\$4.266 M

4.5 Intellectual Property

The University of Guelph, in partnership with OMAFRA, seeks to bring research discoveries that have commercial potential to practical application which a particular emphasis on benefiting Ontarians and Canadians. The intellectual property section of this report records the status of commercialization of research discoveries that have benefited from OMAFRA funding. Once researchers identify discoveries as having potential commercial value, the Business Development Office (BDO) at the University evaluates the market potential and whether formal intellectual property protection is possible and then assists in obtaining funding to develop these to the point that uptake is possible by industry. BDO then negotiates licenses or, more rarely, assists in company formation. Our goal is to maximize and balance benefits to researchers, the institutions, business and society. The bulk of our licenses are to Canadian companies; the goal of licenses to foreign companies is to generate revenue from sales abroad that can be reinvested in programs in Ontario and to facilitate access to research tools in the advancement of science.

Aggregate financial information

OMAFRA (on behalf of ARIO) and the University share revenues (usually royalties) and expenses (usually legal fees for IP protection) associated with commercialization projects in proportion to funding that each provides to the project that generated the discovery. The IP portfolio consists of 2 parts - germplasm (plant cultivars) and non-germplasm technologies. During the University's fiscal year ending April, 2007 it remitted \$235,603 in revenues to OMAFRA from non-germplasm discoveries and OMAFRA also received \$386,873 in germplasm revenues for a total of \$622,476. This compares to \$321,083 in non-germplasm revenue and \$355,046 from germplasm for a total of \$676,129 in the previous period. Not included in germplasm revenue for the year ended 2007 is \$26,374 in royalties collected by us and paid to other joint owners. As was noted in the prior year, now that seed companies are being expected to support breeding programs and research stations previously funded almost entirely from public sources, this may result in germplasm revenue plateauing or decreasing as those private sector partners may have to rationalize their investments in germplasm development. OMAFRA's share of expenses were \$2,516 on the germplasm portfolio (versus \$5,717 last year) and \$ 59,925 on the rest of the portfolio (versus \$73,878 last year).

It should be noted that germplasm royalties were received in the year on 171 plant cultivars (as compared to 137 last year) - the distribution being 35.1% soybean, 11.1% cereals and forages, 24.0% maize, and the remainder almost equal amounts of white bean, forages, canola, apple rootstocks, strawberries, asparagus and tree fruits. Royalties were received on 10 non-germplasm technologies (versus 8 the previous year), the largest amounts being from a cattle vaccine and a milk technology.

Disclosures of New Inventions

The commercialization and protection process begins with disclosure by researchers of novel inventions that might have commercial value. Disclosures from projects which OMAFRA had contributed funding rose in fiscal 2007 to 288 (versus 310 to the University as a whole) from 137 (versus 152 to the university as a whole) in the previous year. 279 of the 288 disclosures were new plant cultivars (germplasm) – 1 wheat, 8 barley, 16 bean, 44 soybean, 38 tomatoes, 13 strawberries, and 159 canola varieties. Of the 9 non-germplasm disclosures, 3 were bulls bred for tenderness sold for stud (royalties to be paid on semen), one was an encapsulation technology to reduce lipid oxidation; the rest were immunology and disease markers or vaccine candidates.

Table 4.5.1 Germplasm Disclosures:

Disclosures						
Fiscal year	2007			2006		Fiscal year
	Germplasm	other	Total	Germplasm	other	Total
All disclosures	279	31	310	126	26	152
OMAFRA related	279	11	288	126	11	137

New License Activity:

There were 33 new licenses, in which OMAFRA has an interest, executed in 2007. Of these, 29 were new germplasm licenses - 23 exclusive and 2 non-exclusive licenses to Canadian companies and 4 non-exclusive licenses to non-Canadian companies. Of non-germplasm patents and technologies, one was exclusive to a Canadian company, one was non-exclusive to a Canadian company and one was exclusive to a foreign multinational.

4.5.1 IP Protection and Status

OMAFRA had an interest in 12 of the 38 new patent applications that the University filed in the last fiscal year. Three of these were provisional applications filed in the US, 2 were a Patent Cooperation Treaty filings (generally made 1 year after the filing of a provisional application), 6 were regular applications, and one was a continuation/divisional. OMAFRA had an interest in three of the patents (all US) issued in the year, of the 10 total that were issued to the University. The markedly lower number of patent applications as compared to disclosures relates to several factors, the largest of which is that patent applications on plant cultivars are not permitted in Canada and have restricted value in relation to costs in the US. Instead, commercial rights for the use of plant cultivars are controlled by contracts and Material Transfer Agreements. We also file Plant Breeders' Rights ("PBR") applications, which give very limited protection, only if a licensee believes these rights will be useful to it in marketing and dissemination/sale. Increasingly, licensees pay for new PBR filings out of royalties. Two PBR applications were filed during the fiscal year; 1 was issued.

The second reason for the low level of patent filings in relation to the number of disclosures is that many of the disclosures other than plant cultivars were so early stage that further work is required to support potential claims before filings can be made. In some cases this requires genetic sequencing; in another the results of early human trials must be evaluated. OMAFRA had an interest in 54 issued or validated patents (some of which are administered by a joint owner); 46 of which are licensed or optioned.

Ownership

Plant cultivar ownership is maintained by the university and never reassigned back to the creators as all cultivars may have breeding potential. There have been more than 1,800 varieties disclosed over the years - listings are kept in an electronic database.

Non-Germplasm Portfolio by Technology

The OMAFRA contract requires that any technology that the University wishes to be abandoned must first be offered to OMAFRA for commercialization. In recent years, re-evaluations of technologies that result in a recommendation for abandonment have been presented to OMAFRA and OMAFRA has concurred. The status of individual, non-germplasm technologies since last year is as follows:

Tech ID	Title	Tech Status
Baird 20011109	JEB diagnostic test for Belgian horses	Licensed - Non-Exclusive; revenue declining as trait reduced
Betts 20051114	Canine embryonic stem cell lines isolated at the University of Guelph. Current lines are named K1, K3, KP, S1, S2, SP, BP and CP	Evaluation by company under MTA
Buhr 19980406	Reduction of Sperm Sensitivity to chilling/freezing	option to sponsor of research contract
Carman 20010628	Virulent Noncytopathic Type 2 Bovine Viral Diarrhea Virus (BVDV) Strain 24515	Marketing - probably will be abandoned
Carman 20010628-2	Cytopathic Type 2 Bovine Viral Diarrhea Virus (BVDV) Strain 53637	Licensed - Non-Exclusive
Corredig20060523	Membrane derived encapsulation of lipid	returned for further research
de Lange 20050221	Pig Growth Model	mktg by joint owner - non-exclusively
Derbyshire 19890502	Recombinant fowlpox virus (rFPV) and Recombinant baculovirus (rBV) expressing the HN gene of Newcastle disease virus	MTA with company who is still using materials
Dixon 20060328	A Protocol for Using Aqueous Ozone to Extend the Shelf-life of Cut Roses	not patentable - know-how possible for other cut flowers
Doran 20030329-2	Method for the preparation of concentrated allium flavour extracts	not patentable
Doran 20030329-3	Protocol for employing oxidative stress in a controlled environment as to stimulate secondary product formation in high-value crops, such as the onion	not patentable
Erickson 20010524	Novel Inducible Genes from Alfalfa and Methods of Use Thereof	Licensed - non-exclusive
Etches 19970425	Production of Human Immunoglobulins in Chicken Eggs	Licensed - Exclusive
Forsberg 19990526	Transgenic animals expressing salivary phytase	Marketing
Griffiths 20060428-1	Cloning and Production of recombinant omega-3 polyunsaturated fatty acid (docosahexaenoic acid)	sequence still needed
Griffiths 20060428-2	Method for bacteria concentration and detection based on immobilized recombinant bacteriophage	patent filed

Hays20061026	disease resistance gene	marketing
Holub 19960430	Custom Feed Supplement to Maximize Omega-3 Fatty Acids in Cow's Milk	Licensed - Exclusive
Holub 19980622	Garlic Processing Technique	License terminated
Kasha 19980429	Embryogenesis and Plant Regeneration from Microspores	Marketing
Kott 20060221	Mentha spicata (spearmint) clones with ultra high levels of rosmarinic acid (a powerful plant antioxidant)	patent filed; targeted to allergic rhinitis, human clinical trial underway
Mallard 079981	Method of identifying high immune response periparturient animals	Not licensed - US patent to issue
McGurrin 20040402	Pressure and ultrasound-guided cardiac catheter for transvenous electrical cardi diversion of equine supra-ventricular cardiac arrhythmias	Licensed, exclusively. Is an improvement to company IP
Mckersie 19870324	Process to induce desiccation tolerance in somatic embryos	Licensed - patents will expire soon
Mckersie 19971215	Enhanced Root Production in Transgenic Perennial Plants	Licensed - Non-Exclusive
Miller	3 bulls bred for tenderness	Sold; royalty to be received on semen sales
Nagy 20000817	Porcine Adenovirus Based Vector, Vaccine	Licensed - Exclusive
Nagy 20030530	Fowl Adenovirus (FAdV) based vaccine for Poultry; FAdV based expression vector for Gene Delivery	Licensed exclusive
Nagy 20051115	Fowl Adenovirus (FAdV) based helper independent multivalent vaccine. FAdV based expression vector for gene delivery	Published, unable to patent, to be abandoned. Note: issues related to freedom to operate
O'Brien 19900111	Diagnosis for Porcine Malignant Hyperthermia	Licensed - non-exclusive to many companies
Paliyath 19980831	Inhibition of Phospholipase D activity by C6 Aldehydes and Alcohols	Licensed - exclusive
Paliyath 20000517	Development of a Novel Antioxidant Formulation to Control Superficial Scald in Apples	Licensed - exclusive
Pauls 20040630	Bean Phenylpropanoid Pathway Microarray	marketing
Plante 20000810	Porcine Embryo Production, Recovery, Maintenance and Transfer Systems for Use in Domestic and International Genetic Transport and the Elimination of Environmental Pathogens in Swine.	Licensed - exclusive
Saxena 19981216	Micropropagation technologies for phytopharmaceutical: St. John's Wort	Marketing - probably will be abandoned
Shewen 19850207	Vaccine for Prevention of Pasteurella haemolytica pneumonia in Cattle.	Licensed - Exclusive
Shewen 20040604	An edible vaccine stimulating immune response in cattle to antigens of Mannheimia haemolytica, the principal cause of bovine pneumonic pasteurellosis	Evaluation
Squires 19961016	Method for Identifying Pigs with Genetically Reduced Levels of Boar Taint Steroids	Marketing - non-exclusive, previously under option to

		research sponsor
Squires 19971128	Genetic Markers for Pigs with Low Skatole (P450IIE)	Marketing - non-exclusive, previously under option to research sponsor
Squires 19990921	Identification of Metabolites and Key Enzymes in Skatole Metabolism in Liver	Marketing - non-exclusive, previously under option to research sponsor
Squires 20030825	Genetic Marker for Boar Taint in Sulphur Transferase	Marketing - non-exclusive, previously under option to research sponsor
Squires 20050616	Porcine Sulfortransferase 2A1	Marketing - non-exclusive, previously under option to research sponsor
Squires 20060323-1	Genetic Markers in Nuclear Receptor Genes for Boar Taint	Marketing - non-exclusive, previously under option to research sponsor
Squires 20060323-2	Genetic Markers in 8 Genes for Boar Taint	Marketing - non-exclusive, previously under option to research sponsor
Swanton 20060321	Genetic basis for increased stress tolerance of plants to changes in light quality (R/FR)	Research contract with option to sponsor

5. FINANCIAL SUMMARY

5.1 Introduction:

The following financial data have been presented as ‘Fully Allocated Costs’ for each of the programs as well as the Research and Diploma Education sub-programs. (This method has been utilized beginning in the 2004/05 Annual Report, at the request of OMAFRA.) In this presentation format, the ‘indirect costs’ (such as operating research stations and providing student support services, administrative services such as budget management and human resources functions, and physical plant infrastructure) have been allocated to each individual program and sub-program using a consistent methodology to arrive at the reported ‘Fully Allocated Cost by Program/Sub-program’. (In the past, the indirect costs were shown as ‘Infrastructure & Support’ costs in the tables showing the program and overall Agreement costs).

Consequently, the 2006/07 Annual Report includes tabular presentation of the **Fully Allocated Costs** for:

- The overall Agreement, broken down by Program area, including graphic presentation of this data (Figure 2.)
- The Research Program, broken down by sub-program area (Food, Bioproducts, etc.) (Table 5.1.2.)
- The Education Program, including the Diploma Program broken down by sub-program area (Agriculture, Horticulture, etc.) and Continuing Education / Business Development and Training Costs (Table 5.1.3.)
- The Laboratory Services Program broken down by major expense categories (Table 5.1.4.)
- The VCEP Program in summary form (Table 5.1.5) with details of expenditures by program objective. (Table 2.5.1.)

This Fully Allocated Costs presentation format provides a much more informative arrangement of the financial data, and is not subject to the same problems in interpretation of program costs as in previous years’ presentations. Nevertheless, it is not advisable to use these data for making decisions about incremental allocations/reductions in budget, since such decisions may have variable impact on the direct versus indirect cost bases. For example, reducing ‘Sustainable Production Systems Research sub-program’ expenditures may have less impact than intended, unless the continuing cost of operating the research stations on which the SPS Program is built is also part of the decision process).

Table 5.1.1: OMAFRA Program Summary - 2006/2007 Fully Allocated ¹⁾ Expenditures and Revenues by Program and Location (in thousands of dollars)												
Program Area	Alfred		Kemptville		Ridgetown		Lab Services Div.		Guelph		TOTAL	
	'06/'07	'05/'06	'06/'07	'05/'06	'06/'07	'05/'06	'06/'07	'05/'06	'06/'07	'05/'06	'06/'07	'05/'06
Research												
Total Expenses	486	125	3,409	2,620	3,653	3,061	-	-	28,150	28,564	35,698	34,371
Revenues	(253)	(0)	(647)	(413)	(351)	(304)	-	-	(2,653)	(2,433)	(3,904)	(3,150)
Net Expenses *	234	125	2,762	2,208	3,302	2,757	-	-	25,496	26,131	31,794	31,221
Diploma Education												
Total Expenses	2,285	2,258	3,622	3,266	4,550	3,753	-	-	345	354	10,802	9,631
Revenues	(514)	(457)	(2,042)	(2,109)	(2,541)	(2,584)	-	-	(247)	(261)	(5,344)	(5,411)
Net Expenses *	1,771	1,801	1,580	1,157	2,009	1,168	-	-	98	93	5,458	4,220
Continuing Ed. / Bus/ dev. & Training												
Total Expenses	707	1,291	4,065	3,129	3,268	2,498	-	-	-	-	8,050	6,918
Revenues	(574)	(480)	(2,736)	(2,345)	(3,008)	(2,440)	-	-	-	-	(6,318)	(5,265)
Net Expenses *	133	811	1,329	784	260	58	-	-	-	-	1,722	1,653
Veterinary Clinical Education Program (VCEP)												
Total Expenses	-	-	-	-	-	-	-	-	4,755	4,755	4,744	4,755
Revenues	-	-	-	-	-	-	-	-	-	-	-	-
Net Expenses *	-	-	-	-	-	-	-	-	4,755	4,755	4,744	4,755
Laboratory Services												
Total Expenses	-	-	-	-	-	-	23,015	20,169	-	-	23,015	20,169
Revenues	-	-	-	-	-	-	(11,909)	(12,023)	-	-	(11,909)	(12,023)
Net Expenses *	-	-	-	-	-	-	11,106	8,146	-	-	11,106	8,146
Total - All Programs, excluding Minor Capital Repair Fund												
Total Expenses	3,478	3,674	11,096	9,015	11,471	9,312	23,015	20,169	33,239	33,673	82,299	75,844
Revenues	(1,340)	(937)	(5,425)	(4,866)	(5,900)	(5,328)	(11,909)	(12,023)	(2,900)	(2,694)	(27,475)	(25,849)
Net Expenses *	2,138	2,737	5,671	4,149	5,571	3,984	11,106	8,146	30,339	30,979	54,824	49,995
OMAFRA Minor Capital Repair Fund ²⁾												
Total Expenses	359	66	539	90	224	137	-	-	1,853	1,102	2,975	1,395
Revenues	(359)	(45)	(487)	(90)	(242)	(137)	-	-	(1,825)	(892)	(2,914)	(1,164)
Net Expenses *	(0)	21	51	-	(18)	-	-	-	28	210	61	231
Total - All Programs, including Minor Capital Repair Fund												
Total Expenses ³⁾	3,837	3,741	11,635	9,105	11,696	9,449	23,015	20,169	35,092	34,775	85,274	77,239
Revenues	(1,700)	(983)	(5,913)	(4,956)	(6,142)	(5,464)	(11,909)	(12,023)	(4,726)	(3,586)	(30,389)	(27,013)
Net Expenses *	2,137	2,758	5,722	4,149	5,553	3,984	11,106	8,146	30,366	31,189	54,885	50,226
* Net Expenses represents the OMAFRA transfer payment contribution to that program/location. ¹⁾ Program Service Costs and Institutional Infrastructure and Support costs have been allocated to each of the sub-programs to demonstrate the 'all-in' (i.e., Fully Allocated) costs for each program/location ²⁾ As of year-end, a few OMAFRA Minor Capital projects had not had funds fully expended due to later delivery and vendor invoicing of the goods and services. All of these projects were fully completed, and reimbursement of expenses received from OMAFRA where applicable, in the first few months of the new fiscal year. This ensures the net expenses for each project under the Minor Capital Repair program is brought to \$0. ³⁾ A portion of the Agreement Service Costs (\$6,485 in total for 06/07) was allocated to each location as part of the 'fully allocated costs' methodology. This allocation is the difference between the Fully Allocated net expenses by location and the net direct expenses by location.												

Distribution of Transfer Payment 2006/2007

This shows the net actual expenditures (i.e., total expenses less revenues) of OMAFRA transfer funds, by location for 2006/07. The values presented reflect any carry-forwards of unspent funds from fiscal 2005/06.

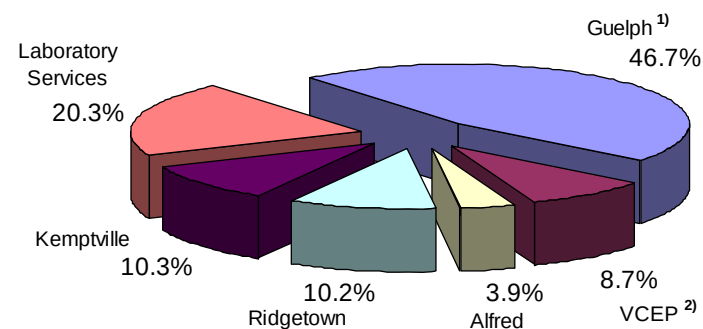
The actual transfer of funds under the OMAFRA University of Guelph agreement was \$54.8 million in 2006/07, up from the \$50.5 million transferred in 2005/06. The additional \$3.8 million added to the transfer payment was to provide additional support for the day-to-day Operations and Maintenance (O&M) programs for the 17 ARIO-owned research stations and regional campuses, for which the O&M was managed previously by the Ontario Realty Corporation.

Figure 1. Distribution of Transfer Payment 2006/2007 by Location (Fully Allocated Expenditures)

Location	<u>2006/2007</u> <u>Program Costs</u>		<u>2005/2006</u> <u>Program Costs</u>	
	\$ (millions)	%	\$ (millions)	%
Guelph ¹⁾	25.6	46.7	26.2	52.5
VCEP ²⁾	4.7	8.7	4.8	9.5
Alfred	2.1	3.9	2.7	5.5
Ridgetown	5.6	10.2	4.0	8.0
Kemptville, New Liskeard	5.7	10.3	4.2	8.3
Laboratory Services	11.1	20.3	8.1	16.3
<i>Total:</i>	54.8	100	50.0	100

Note: Fiscal 2006/2007 includes the additional transfer payment for the Operations and Maintenance (O&M) Program. The OMAFRA Minor Capital Repair Fund is excluded from the values shown.

**Distribution of OMAFRA Transfer Payment
By Location - 2005/2006**



⁽¹⁾ Includes expenditures for research stations at Arkell, Elora, Ponsonby, Woodstock and Guelph Turfgrass Institute, Vineland, Simcoe, Bradford and all Guelph campus research and diploma education activities.

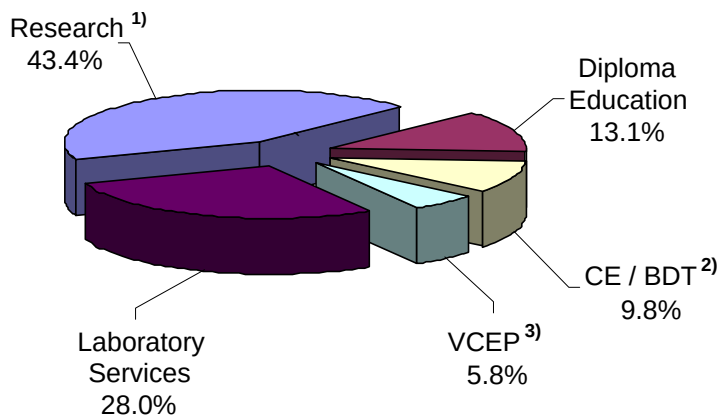
⁽²⁾ Veterinary Clinical Education Program

Note: These Figures exclude Minor Capital Repair Fund.

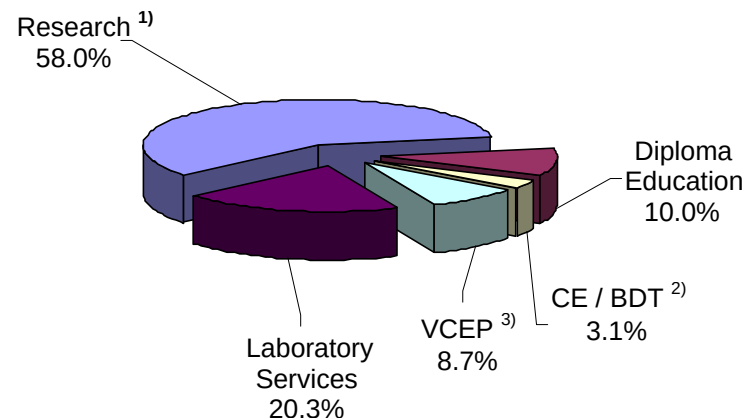
Figure 2: Fully Allocated Gross Expenditures by Program - 2006 / 2007

Location	2006 / 2007				2005 / 2006			
	Total Program Expenditures		OMAFRA Transfer		Total Program Expenditures		OMAFRA Transfer	
	\$ (millions)	%	\$ (millions)	%	\$ (millions)	%	\$ (millions)	%
Research ¹⁾	35.7	43.4	31.8	58.0	34.4	45.3	31.2	62.4
Diploma Education	10.8	13.1	5.5	10.0	9.6	12.7	4.2	8.4
CE / BDT ²⁾	8.0	9.8	1.7	3.1	6.9	9.1	1.7	3.3
VCEP ³⁾	4.7	5.8	4.7	8.7	4.8	6.3	4.8	9.5
Laboratory Services	23.0	28.0	11.1	20.3	20.2	26.6	8.1	16.3
<i>Total:</i>	82.3	100	54.8	100	75.8	100	50.0	100

**Total OMAFRA / U of G Program Gross Expenditures
(Fully Allocated) by Program - 2006/2007**



**Distribution of OMAFRA Transfer Payment
by Program – 2006/2007**



⁽¹⁾ Includes expenditures for research stations, Vineland, Simcoe, Bradford and all Guelph campus research and diploma education activities.

⁽²⁾ Continuing Education / Business Development Training.

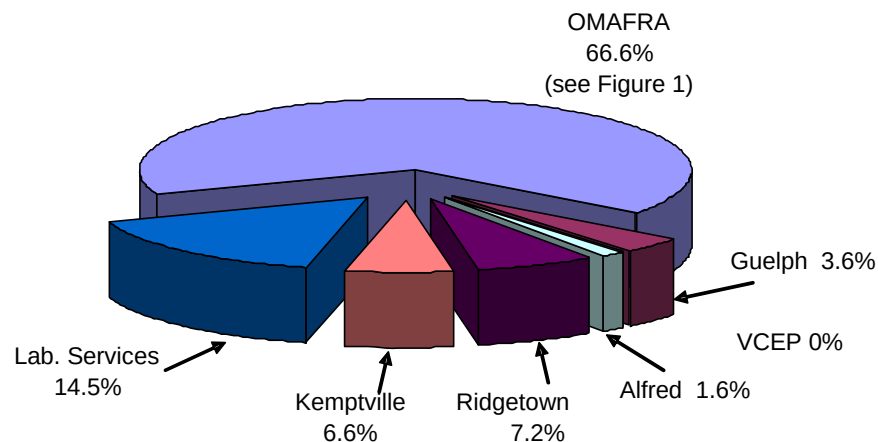
⁽³⁾ Veterinary Clinical Education Program

Note: These Figures exclude Minor Capital Repair Fund.

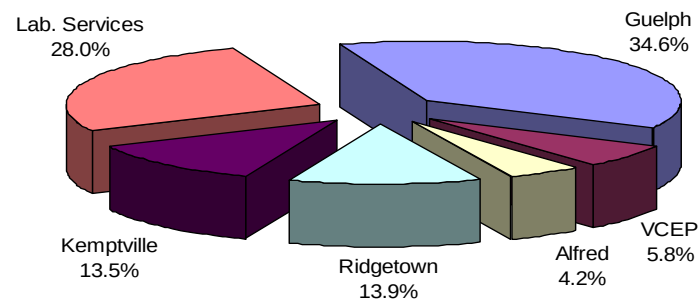
Figure 3: OMAFRA Agreement Total Expenditures and Revenues - Fully Allocated

Location	Fiscal 2006 / 2007				Fiscal 2005 / 2006			
	Expenditures		Revenues		Expenditures		Revenues	
	\$ (millions)	%	\$ (millions)	%	\$ (millions)	%	\$ (millions)	%
OMAFRA Agreement			54.8	66.6			50.0	65.9
Guelph ¹⁾	28.5	34.6	2.9	3.6	28.9	38.2	2.7	3.6
VCEP ²⁾	4.7	5.8	0.0	0.0	4.8	6.3	0.0	0.0
Alfred	3.5	4.2	1.3	1.6	3.7	4.8	0.9	1.2
Ridgetown	11.5	13.9	5.9	7.2	9.3	12.3	5.3	7.0
Kemptville	11.1	13.5	5.4	6.6	9.0	11.9	4.9	6.4
Lab. Services	23.0	28.0	11.9	14.5	20.2	26.6	12.0	15.9
<i>Total:</i>	82.3	100	82.3	100	75.8	100	75.8	100

**OMAFRA Contract: 2006/2007
Gross Revenues**



**OMAFRA Contract: 2006/2007
TOTAL PROGRAM EXPENDITURES**



⁽¹⁾ Includes expenditures for research stations, Vineland, Simcoe, Bradford and all Guelph campus research and diploma education activities.

⁽²⁾ Veterinary Clinical Education Program

Note: These Figures exclude Minor Capital Repair Fund.

Program Area	Alfred		Kemptville		Ridgetown		Guelph		TOTAL	
	'06/'07	'05/'06	'06/'07	'05/'06	'06/'07	'05/'06	'06/'07	'05/'06	'06/'07	'05/'06
Sustainable Production Systems (SPS)										
Total Expenses	390		2,391		2,196		21,696		26,672	
Revenues	(252)		(475)		(210)		(2,660)		(3,597)	
Net Expenses *	138		1,916		1,985		19,037		23,076	
Animals & Plants Programs (reconfigured under SPS Program in '06/'07)										
Total Expenses	-	-	see SPS	2,263	see SPS	2,033	see SPS	22,737	see SPS	27,032
Revenues	-	-	-	(405)	-	(201)	-	(2,442)	-	(3,049)
Net Expenses *	-	-	-	1,857	-	1,831	-	20,295	-	23,984
Food										
Total Expenses	-	-	80	61	-	-	2,266	1,884	2,346	1,945
Revenues	-	-	(7)	(1)	-	-	-	(1)	(7)	(2)
Net Expenses *	-	-	73	60	-	-	2,265	1,882	2,338	1,943
Resources Management & Environment										
Total Expenses	97	125	938	297	1,457	1,029	2,630	3,255	5,123	4,705
Revenues	(1)	-	(166)	(7)	(140)	(102)	-	(10)	(307)	(119)
Net Expenses *	96	125	772	290	1,317	926	2,630	3,246	4,816	4,586
Sustainable Rural Communities										
Total Expenses	-	-	-	-	-	-	332	330	332	330
Revenues	-	-	-	-	-	-	7	20	7	20
Net Expenses *	-	-	-	-	-	-	339	350	339	350
Bioproducts ³⁾										
Total Expenses	-	-	-	-	-	-	1,226	358	1,226	358
Revenues	-	-	-	-	-	-	(0)	-	(0)	-
Net Expenses *	-	-	-	-	-	-	1,226	358	1,226	358
Total										
Total Expenses ⁴⁾	486	125	3,409	2,620	3,653	3,061	28,150	28,564	35,698	34,371
Revenues	(253)	(0)	(647)	(413)	(351)	(304)	(2,653)	(2,433)	(3,904)	(3,150)
Net Expenses *	234	125	2,762	2,208	3,302	2,757	25,496	26,131	31,794	31,221

* Net Expenses represents the OMAFRA transfer payment contribution to that program/location.

¹⁾ Program Service Costs and Institutional Infrastructure and Support costs have been allocated to each of the sub-programs to demonstrate the 'all-in' (i.e., Fully Allocated) costs for each sub-program/location.

²⁾ \$3.4K of expenses for IP Review Costs related to proposals for the SP2 program were included within the Animal Program expenses reported here

³⁾ The Bioproducts Research program was initiated in fiscal 2005/06

⁴⁾ A portion of the Agreement Service Costs (\$5,893 in total for research in '06/'07) was allocated across locations as part of the 'fully allocated costs' methodology. This allocation is the difference between the Fully Allocated net expenses by location as reported in Table 5.1.2 and the net direct expenses by location.

Table 5.1.3: 2006/2007 Fully Allocated ¹⁾ Education Program Expenditures and Revenues by Sub-Program and Location (in thousands of dollars)										
Program Area	Alfred		Kemptville		Ridgetown		Guelph		TOTAL	
	'06/'07	'05/'06	'06/'07	'05/'06	'06/'07	'05/'06	'06/'07	'05/'06	'06/'07	'05/'06
DIPLOMA EDUCATION PROGRAMS										
Agriculture										
Total Expenses	1,028	1,163	2,401	2,225	1,460	1,175	-	-	4,888	4,563
Revenues	(159)	(133)	(1,516)	(1,614)	(1,060)	(1,033)	-	-	(2,734)	(2,780)
Net Expenses *	869	1,030	885	611	400	143	-	-	2,154	1,784
Horticulture										
Total Expenses	-	-	400	228	836	701	-	0	1,237	929
Revenues	-	-	(210)	(108)	(326)	(338)	-	-	(536)	(446)
Net Expenses *	-	-	191	120	510	362	-	0	701	483
Food & Nutrition										
Total Expenses	348	383	821	813	-	-	-	-	1,168	1,195
Revenues	(36)	(47)	(317)	(387)	-	-	-	-	(353)	(434)
Net Expenses *	311	335	504	425	-	-	-	-	815	761
Veterinary Technician										
Total Expenses	909	713	-	-	1,654	1,384	-	-	2,563	2,097
Revenues	(319)	(276)	-	-	(861)	(875)	-	-	(1,180)	(1,151)
Net Expenses *	590	436	-	-	793	509	-	-	1,383	946
Environmental Management										
Total Expenses	-	-	-	-	600	492	-	-	600	492
Revenues	-	-	-	-	(294)	(338)	-	-	(294)	(338)
Net Expenses *	-	-	-	-	306	154	-	-	306	154
Turf Management										
Total Expenses	-	-	-	-	-	-	345	354	345	354
Revenues	-	-	-	-	-	-	(247)	(261)	(247)	(261)
Net Expenses *	-	-	-	-	-	-	98	93	98	93
Total - DIPLOMA EDUCATION PROGRAMS										
Total Expenses	2,285	2,258	3,622	3,266	4,550	3,753	345	354	10,802	9,631
Revenues	(514)	(457)	(2,042)	(2,109)	(2,541)	(2,584)	(247)	(261)	(5,344)	(5,411)
Net Expenses *	1,771	1,801	1,580	1,157	2,009	1,168	98	93	5,458	4,220
CONTINUING EDUCATION / BUSINESS DEVELOPMENT & TRAINING										
Total Expenses	707	1,291	4,065	3,129	3,268	2,498	-	-	8,040	6,918
Revenues	(574)	(480)	(2,736)	(2,345)	(3,008)	(2,440)	-	-	(6,318)	(5,265)
Net Expenses *	133	811	1,329	784	260	58	-	-	1,722	1,653
Total - All Education Programs										
Total Expenses ²⁾	2,992	3,549	7,687	6,395	7,818	6,251	345	354	18,842	16,549
Revenues	(1,088)	(937)	(4,778)	(4,454)	(5,550)	(5,024)	(247)	(261)	(11,662)	(10,676)
Net Expenses *	1,904	2,612	2,909	1,941	2,269	1,227	98	93	7,180	5,873

* Net Expenses represents the OMAFRA transfer payment contribution to that program/location.

¹⁾ Program Service Costs and Institutional Infrastructure and Support costs have been allocated to each of the sub-programs to demonstrate the 'all-in' (i.e., Fully Allocated) costs for each program/location.

²⁾ A portion of the Agreement Service Costs (\$257K in total for Education Programs in 06/07) was allocated to each location as part of the 'fully allocated costs' methodology. This allocation is the difference between the Fully Allocated net expenses by location as reported in Table 5.1 .3 and the net direct expenses by location.

Table 5.1.4: 2006/2007 Fully Allocated ¹⁾ Laboratory Services Division Expenditures by Program (in thousands of dollars)

Program Area	Guelph	
	'06/'07	'05/'06
Animal Health Laboratory		
Total Expenses	10,659	8,518
Revenues	(3,437)	(2,952)
Net Expenses *	7,222	5,565
Food Safety & Scheduled Product/Plant/Soil Analyses		
Total Expenses	12,356	11,652
Revenues	(8,472)	(9,071)
Net Expenses *	3,884	2,581
Total		
Total Expenses	23,015	20,169
Revenues	(11,909)	(12,023)
Net Expenses *	11,106	8,146

Direct Program Expenses (Sch. K base)	9,000	9,000
Carry-forward from prev. year	<u>2,831</u>	<u>1,705</u>

Sub-total:	11,831	10,705
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Allocated Service Costs ²⁾	272	272
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less Year end balance	<u>(998)</u>	<u>(2,831)</u>
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Fully Allocated Costs	11,106	8,146
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Notes:

* Net Expenses represents the OMAFRA transfer payment contribution to that program/location.

¹⁾ Program Service Costs and Institutional Infrastructure and Support costs have been allocated to each of the sub-programs to demonstrate the 'all-in' (i.e., Fully Allocated) costs for each sub-program/location

²⁾ A total of \$272K of the portion of the Agreement Service Costs was allocated to LSD as part of the 'fully allocated costs' methodology. This allocation is the difference between the Fully Allocated net expenses by location as reported in Table 5.1.4 and the net direct expenses by LSD.

Table 5.1.5: 2006/2007 Fully Allocated ¹⁾ VCEP – Veterinary Clinical Education Program Expenditures (in thousands of dollars)

Program Area	Guelph	
	'06/'07	'05/'06
Total		
Total Expenses ²⁾	4,744	4,755
Revenues	-	-
Net Expenses *	4,744	4,755
Allocated Service Costs ²⁾	63	63
Net Direct Expenses	4,681	4,692

Notes:

* Net Expenses represents the OMAFRA transfer payment contribution to that program/location.

¹⁾ Program Service Costs and Institutional Infrastructure and Support costs have been allocated to each of the sub-programs to demonstrate the 'all-in' (i.e., Fully Allocated) costs for each sub-program/location.

²⁾ A total of \$63K of the portion of the Agreement Service Costs was allocated to LSD as part of the 'fully allocated costs' methodology. This allocation is the difference between the Fully Allocated net expenses as reported in Table 5.1.5 and the net direct expenses for VCEP.

5.2 2006/2007 OMAFRA Minor Capital Program

In this third year of the OMAFRA Minor Capital Program, OMAFRA announced that over three million dollars had been approved for program funding in the areas of animal care and deferred maintenance at the research stations and regional campuses. These funds were, as in previous years, targeted specifically to address the most critical facility deficiencies pertaining to animal care, health and safety, and code compliance, along with some crucial purchases of equipment.

Using the 'facility deficiency lists' submitted by the U of G to OMAFRA as of June 2006, again this year in order to get a head start of the tendering process this list was submitted to OMAFRA in April/May 2006. This strategic listing of 'animal care and deferred maintenance' priority projects was developed with input from Ministry and U of G station/campus representatives and subsequently approved by senior OMAFRA and U of G management. In addition, a short-list of smaller, 'quick-turn around' projects was established that could be funded if there was unspent money near year-end.

After approval-in-principle for the project listing local U of G Managers obtained the requisite quotes/tenders as applicable according to the U of G and Ministry purchasing guidelines, and the recommended quotes were given final approval by Ministry staff. In accordance with agreed on procedure, the projects were managed administratively by the University using purpose-designated project accounts, and once the project was completed the University invoiced the Ministry for reimbursement of the costs.

The following table summarizes the number and \$ value of the minor capital projects funded in 2006/07 by location.

Table 5.2.1: Total Minor Capital Projects by Location

Station	# of Projects	Total Cost
Alfred College	7	359,341
Alma Res. Stn	3	37,097
Arkell Equine Res. Stn.	3	94,039
Arkell Feedmill	3	58,781
Arkell Poultry Res. Stn.	2	33,661
Arkell/Elora Res. Stn. Operations	9	328,383
Arkell Swine Res. Stn.	4	192,964
Elora Beef Res. Stn.	4	132,395
Elora Crop Science Res. Stn	3	36,465
Elora/Ponsonby Dairy Res. Stn.	7	376,637
Kemptville College	8	214,119
Muck Res. Stn	1	26,143
New Liskeard Res. Stn.	7	273,177
Ponsonby General Res. Stn.	2	31,518
Ponsonby Sheep Res. Stn.	2	81,319
Ridgetown College	7	338,846
Simcoe Res. Stn.	3	38,575
Turfgrass Res Institute	3	50,680
Office of Research Guelph	1	100,000
Vineland Res. Stn.	5	108,539
Winchester Res. Stn.	0	0
Woodstock Res. Stn.	5	98,287
Total	89	3,010,966

In addition to the above, other monies were allocated but managed directly between OMAFRA and ORC for several decommissioning projects, as outlined in the table below:

Table 5.2.2 Decommissioning Projects

Decommissioning Projects		
New Liskeard Res. Stn.	1	117,452
Arkell/Elora Res. Stn. Operations	1	41,407
Kemptville College	1	10,885
Total	3	169,744
OMAFRA Minor Capital Projects for 2006/07		3,180,710

6. MEDIA COVERAGE

Between May 2006 and April 2007, the combined efforts of students in Students Promoting Awareness of Research Knowledge (SPARK), and the agricultural communication classes, both based at the University of Guelph, have produced the following list of published and broadcast news stories on a variety of OMAFRA-sponsored projects.

These stories have appeared in a number of different publications, and cover the spectrum of the University's many different agricultural research institutions and sites, including the regional campuses – Kemptville, Ridgetown and Alfred – and the research stations, as well as the colleges on the main Guelph campus.

The primary vehicles for publication are the Ontario farm media, the University of Guelph main website and research website, and the *Guelph Mercury* through the weekly column *SPARKPlugs*. Through an agreement with OMAFRA's Town & Country Ontario television, students contribute *InfoBreaks* to that program, as well.

Research news articles can be accessed from www.uoguelph.ca/research/news/index.shtml and general information on the University's research communications can be found at www.uoguelph.ca/research/communications/index.shtml.

Research Magazine Spring 2007

"Premium compost," *Research* – Spring 2007 (Ron Fleming, Ridgetown Campus)

"Stored spuds that don't darken," *Research* – Spring 2007 (Rickey Yada, Department of Food Science)

"Against the wind," *Research* – Spring 2007 (Istvan Rajcan, Department of Plant Agriculture)

"The new and improved Millennium," *Research* – Spring 2007 (David Wolyn, Department of Plant Agriculture)

"Minding the weeds," *Research* – Spring 2007 (Mike Cowbrough, weed management lead for OMAFRA, François Tardif and Clarence Swanton, Department of Plant Agriculture)

"When manure's on the move," *Research* – Spring 2007 (Kari Dunfield, Department of Land Resource Science)

"The Unfriendly Giant," *Research* – Spring 2007 (François Tardif, Department of Plant Agriculture)

"Sugar beets that can't be beat," *Research* – Spring 2007 (John Zandstra, Ridgetown Campus)

"Cream of the crop," *Research* – Spring 2007 (Duane Falk, Department of Plant Agriculture)

"Peas without disease," *Research* – Spring 2007 (Mary Ruth McDonald, Department of Plant Agriculture)

"Drift, residual effects found in herbicide applications," *Research* – Spring 2007 (Clarence Swanton, Department of Plant Agriculture)

“Talking in circles about the environment,” *Research* – Spring 2007 (Wayne Caldwell, School of Environmental Design and Rural Development)

“See no weevil,” *Research* – Spring 2007 (Hugh Earl, Department of Plant Agriculture)

“Oil from the soil,” *Research* – Spring 2007 (Gary Ablett and Istvan Rajcan, Department of Plant Agriculture)

“An edge for Ontario apple growers,” *Research* – Spring 2007 (John Cline, Department of Plant Agriculture)

“The University of Guelph: The foundation for agri-food research in Ontario,” *Research* – Spring 2007 (agriculture and agri-food research facilities for multiple researchers)

“Watching their step,” *Research* – Spring 2007 (Kerry Lissemore and David Kelton, Department of Population Medicine)

“Soup for pigs: the line begins to form,” *Research* – Spring 2007 (Kees de Lange, Department of Animal and Poultry Science)

“From bad to worse,” *Research* – Spring 2007 (Jeff Caswell, Department of Pathobiology)

“Scrapie detection to the rescue,” *Research* – Spring 2007 (Gordon Hayward and Warren Stiver, School of Engineering)

“Cattle and carbs,” *Research* – Spring 2007 (Kendall Swanson, Department of Animal and Poultry Science)

“The meat of the matter,” *Research* – Spring 2007 (Stephen Miller, Department of Animal and Poultry Science)

“If you can’t beat it, adsorb it,” *Research* – Spring 2007 (Trevor Smith, Department of Animal and Poultry Science)

“More than they can chew,” *Research* – Spring 2007 (Brian McBride, Department of Animal and Poultry Science)

“Environmental effects kept in check on farms,” *Research* – Spring 2007 (Paul Sibley, Department of Environmental Biology)

“Feeding the ideal bird,” *Research* – Spring 2007 (Steve Leeson, Department of Animal and Poultry Science)

“Limiting corn use,” *Research* – Spring 2007 (Art Schaafsma, Ridgetown Campus)

“Flocking to animals’ defence,” *Research* – Spring 2007 (Shayan Sharif, Department of Pathobiology)

Research magazine Fall 2006

“Plan to change,” *Research* – Fall 2006 (Barry Smit, Canadian Research Chair in Global Environmental Change, Department of Geography)

“Tracing metal contamination,” *Research* – Fall 2006 (Beverley Hale, Department of Land Resource Science)

“Keeping tabs on animal disease protects food safety, human health,” *Research* – Fall 2006 (Robert Friendship, Department of Population Medicine)

“An eye on food safety,” *Research* – Fall 2006 (University of Guelph, Animal Health Laboratory)

“National surveillance of wildlife disease is co-ordinated effort,” *Research* – Fall 2006 (Doug Campbell, Canadian Co-operative Wildlife Health Centre staff pathologist)

“Omega-3 chicken about to hatch,” *Research* – Fall 2006 (Steve Leeson, Department of Animal and Poultry Science)

***Guelph Mercury* newspaper**

“Cold-tolerant potatoes key in chip market,” *Guelph Mercury* – April 16, 2007 (Rickey Yada, Department of Food Science)

“Get the dirt on a homegrown flower breeding program,” *Guelph Mercury* – August 15, 2006 (Allan Sullivan, Department of Plant Agriculture)

“A facelift for filters could improve health,” *Guelph Mercury* – July 24, 2006 (Chris Hall, Department of Environmental Biology)

“U of G well positioned to assist in new network studying obesity,” *Guelph Mercury* – July 10, 2006 (Terry Graham and Alison Duncan, Department of Human Health and Nutritional Sciences)

“Farmers adapt as the city moves into the country,” *Guelph Mercury* – May 15, 2006 (Alfons Weersink, Department of Food, Agricultural and Resource Economics)

“Small communities adapt with innovation,” *Guelph Mercury* – May 1, 2006 (Tony Fuller, School of Environmental Design and Rural Development)

***Research Facts* newsletter**

“Research agreement supports world-class agri-food innovation,” *Research Facts* – March 2007 (highlights of research accomplishments from projects with OMAFRA funding)

“Quality control to keep food safe,” *Research Facts* – March 2007 (Laboratory Services partnership)

***Focus on Sustainable Farming* newsletter**

“Cattle feeding strategies reduce greenhouse gas,” *Focus On Sustainable Farming* – July 2006 (Brian McBride, Department of Animal and Poultry Science)

***MaRS Landing* Spring 2007 newsletter**

“Flocking to animals’ defense,” *MaRS Landing* – Spring 2007 (Shayan Sharif, Department of Pathobiology)

“Probing probiotics’ potential,” *MaRS Landing* – Spring 2007 (Gregor Reid, Department of Microbiology, Immunology and Surgery)

***The Milk Producer* magazine**

“Humane dehorning,” *The Milk Producer* – February 2007 (Todd Duffield, Department of Population Medicine)

“Don’t fence me in,” *The Milk Producer* – July 2006 (Paul Sharpe, University of Guelph – Kemptville Campus)

“Getting your cows to cycle,” *The Milk Producer* – June 2006 (Stephen LeBlanc, Department of Population Medicine)

“A new tool for developing diets,” *The Milk Producer* – May 2006 (Brian McBride, Department of Animal and Poultry Science)

***Ontario Beef Farmer* magazine**

“Beefing up feed efficiency,” *Ontario Beef Farmer* – February/March 2007 (Kendall Swanson, Department of Animal and Poultry Science)

“Optimizing female weights for feeding economics,” *Ontario Beef Farmer* – August/September 2006 (Jim Wilton, Department of Animal and Poultry Science)

“A little “snip” with a lot of information,” *Ontario Beef Farmer* – June/July 2006 (Stephen Miller, Department of Animal and Poultry Science)

***Ontario Dairy Farmer* magazine**

“Understanding why cows aren’t cycling,” *Ontario Dairy Farmer* – March 2007 (Stephen LeBlanc and Rob Walsh, Department of Population Medicine)

“Lameness has major effect, says study,” *Ontario Dairy Farmer* – November/December 2006 (Kerry Lissemore and David Kelton, Department of Population Medicine)

“Boosting longevity in dairy herds,” *Ontario Dairy Farmer* – October 2006 (Jim Fisher, Kemptville Campus)

“Energizing heifer diets,” *Ontario Dairy Farmer* – September 2006 (Paul Sharpe, Kemptville College)

“Drink milk, control hunger,” *Ontario Dairy Farmer* – July/August 2006 (Harvey Anderson, Department of Nutritional Sciences)

“New approaches to healthier calves,” *Ontario Dairy Farmer* – May 2006 (Ken Leslie, Department of Population Medicine and Dennis McKnight, Kemptville College)

***Ontario Hog Farmer* magazine**

“Towards a new vaccine for a big problem,” *Ontario Hog Farmer* – May 2007 (Dongwan Yoo, Department of Pathobiology)

“Fewer minerals for more,” *Ontario Hog Farmer* – December 2006 (Paul Luimes, Ridgetown Campus)

“Boars fail to calm aggression in pregnant sows,” *Ontario Hog Farmer* – September 2006 (Tina Widowski, Department of Animal and Poultry Science)

“Closer to a painless solution to boar taint,” *Ontario Hog Farmer* – July/August 2006 (Jim Squires, Department of Animal and Poultry Science)

“Take measures to reduce animal stress,” *Ontario Hog Farmer* – June 2006 (Cate Dewey, Department of Population Medicine)

“Keeping fertilizers friendly,” *Ontario Hog Farmer* – May 2006 (Claudia Wagner-Riddle, Department of Land Resource Sciences)

Ontario Poultry Farmer magazine

“Feeding helpful bacteria boosts chicken immunity,” *Ontario Poultry Farmer* – Summer 2006 (Shayan Sharif, Department of Pathobiology)

GoBIO magazine

“Car, by nature,” *Go.Bio* – Summer 2006 (Mohini Sain, University of Toronto, Faculty of Forestry)

“A facelift for filters,” *Go.Bio* – Summer 2006 (Chris Hall, Department of Environmental Biology)

“Bio-paint, with less chemical taint,” *Go.Bio* – Summer 2006 (Ruben Lenz, Director of Research and Development at Lorama)

“Fuel for hogs,” *Go.Bio* – Summer 2006 (Phil McEwen, Ridgetown Campus)

ON Wheat magazine

“Nitrogen study,” *ON Wheat* – August 2006 (Duane Falk, Department of Plant Agriculture)

“Fusarium resistance,” *ON Wheat* – August 2006 (Lily Tamburic-Ilincic, Ridgetown Campus)

Greenhouse Canada magazine

“U of Guelph’s trial gardens program expands with RBG and Toronto sites,” *Greenhouse Canada* – September 2006 (Rodger Tschanz, Department of Plant Agriculture)

“Canadian born-and-raised flowers could be the next market winners,” *Greenhouse Canada* – September 2006 (Allan Sullivan, Department of Plant Agriculture)

The Grower newspaper

“Farmers adapt as the city moves to the country,” *The Grower* – June 2006 (Alfons Weersink, Department of Food, Agricultural and Resource Economics)

Ontario Beef magazine

“The meat of the matter,” *Ontario Beef* – December 2006 (Stephen Miller, Department of Animal and Poultry Science)

Ayr News newspaper

“Electronic devices help sniff out best controls for swine manure odour,” *Ayr News* – April 11, 2007 (Simon Yang, School of Engineering)

“Performance trials help identify top varieties for wheat producers,” *Ayr News* – April 11, 2007 (Duane Falk, Department of Plant Agriculture)

“The meat of the matter,” *Ayr News* – April 11, 2007 (Stephen Miller, Department of Animal and Poultry Science)

“Stored spuds that don’t darken,” *Ayr News* – April 11, 2007 (Rick Yada, Department of Food Science)

Town and Country Ontario Television InfoBreaks

“Greenhouse Vegetable Food Safety Program,” *Town and Country Ontario, InfoBreak* – Winter 2007 (Rose Martin, Ontario Greenhouse Vegetable Food Safety Program; James Cornies, Cornies Farms Ltd and Florence Gushue, F.P Gushue and Associates)

“Dairy Days,” *Town and Country Ontario, InfoBreak* – Winter 2007 (Paul Haley, Oxford Dairy Producers Committee and Krista Buck, Oxford County Dairy Educator)

“Berkshire Pork,” *Town and Country Ontario, InfoBreak* – Winter 2007 (Fred deMartines, Ontario pork producer and Bruce Thompson, Ontario Pork)

“Dairy Supply Management,” *Town and Country Ontario, InfoBreak* – Winter 2007 (Philip Armstrong, Armstrong Manor Farms)

“Animal Welfare on the Agenda,” *Town and Country Ontario, InfoBreak* – Winter 2007 (John Maaskant, Ontario Farm Animal Council and Tina Widowski, Department of Animal and Poultry Science)

“Seed of the Year,” *Town and Country Ontario, InfoBreak* – Winter 2007 (Martin Harry, SeCan and Rob McLaughlin, Royal Agricultural Winter Fair)

“Beef Market Access Program,” *Town and Country Ontario, InfoBreak* – Winter 2007 (Dale Cowan, Beef Improvement Ontario; Jason Koudys, Market Access Program and Mark Cressman, Ontario beef producer)

“Egg Busters,” *Town and Country Ontario, InfoBreak* – Winter 2007 (Steve Leeson, Department of Animal and Poultry Science and Bruce Weber, Ontario egg farmer)

“Plant Containment and Biosecurity,” *Town and Country Ontario, InfoBreak* – Winter 2007 (Michael Mucci, Plant Growth Facility Coordinator)

“Livestock Animal Biosecurity,” *Town and Country Ontario, InfoBreak* – Winter 2007 (Bev Livingston, Research Facilities Manager)

“Laboratory Animal Biosecurity,” *Town and Country Ontario, InfoBreak* – Winter 2007 (Mary Martini, Central Animal Care Facility Manager)

“Asian Marketing,” *Town and Country Ontario, InfoBreak* – Fall 2006 (Emile McLean, Ontario Pork and Martin Gooch, George Morris Centre)

“Local Beef Branding,” *Town and Country Ontario, InfoBreak* – Fall 2006 (Isabel Dopta, Ontario Cattlemen’s Association and Debbie Coke, Ontario beef farmer)

“New Soyfood Products,” *Town and Country Ontario, InfoBreak* – Fall 2006 (John Michaelides, Guelph Food Technology Centre; Alison Duncan, Department of Health and Nutrition Science and Andrew McVittie, Soyfoods Canada)

“International Agrologists,” *Town and Country Ontario, InfoBreak* – Fall 2006 (Minister Leona Dombrowski, Ontario Ministry of Agriculture, Food and Rural Affairs and Hubert Paulmer, Ontario Institute of Agrologists)

“AgComm Diploma Program,” *Town and Country Ontario, InfoBreak* – Fall 2006 (Mary Buhr, OAC Associate Dean, Academic and Owen Roberts, Academic Co-ordinator)

“Chicken Bio-security,” *Town and Country Ontario, InfoBreak* – Fall 2006 (Verena Hengemuhle, Ontario chicken farmer and John Neil, Chicken Farmers of Ontario)

“Animal Transport Welfare,” *Town and Country Ontario, InfoBreak* – Fall, 2006 (Tracey Laraway, Cambridge Animal Humane Society; Crystal Mackay, Ontario Farm Animal Council and Jennifer Woods, J. Woods Livestock Services, Alberta)

“The Real Dirt on Farming,” *Town and Country Ontario, InfoBreak* – Fall, 2006 (Kelly Daynard, Ontario Farm Animal Council; Jennifer Haley, Ontario Veal Association and Bette Jean Crews, Agricultural Adaptation Council)

“The Faces of Farming,” *Town and Country Ontario, InfoBreak* – Fall, 2006 (Kelly Daynard, Ontario Farm Animal Council and Jennifer Christie, Faces of Farming, June 2007)

“EquiMania,” *Town and Country Ontario, InfoBreak* – Fall, 2006 (Gayle Ecker, Equine Guelph)

“Agrologists in Residence,” *Town and Country Ontario, InfoBreak* – Fall, 2006 (Owen Roberts P.(Ag) (Hon.) Director, Research Communications and Sarah Brown, Articling Agrologist)

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7. UNIVERSITY OF GUELPH/ OMAFRA EQUIPMENT INVENTORY & LIBRARY RESOURCES

<u>Summary of U of G / OMAFRA Equipment Inventories</u>				
For Fiscal 2006/2007				
<u>Location Name</u>	<u>Opening Balance</u> (May 1, 2006)	<u>Acquisitions</u> (during 06/07)	<u>Dispositions</u> (during 06/07)	<u>Ending Balance</u> (April 30, 2007)
<u>Summary (totals of detailed data, below)</u>				
All OMAFRA Program locations	48,943,449	4,004,155	3,096,525	49,851,079
<u>Individual Location Details</u>				
Alfred College	1,761,340	41,875	-	1,803,215
Alma Aquaculture	895,037	28,817	1,180	922,674
Arkell Equine	31,000	6,500	-	37,500
Arkell Feedmill	833,200	-	-	833,200
Arkell Poultry	842,900	12,000	185,327	669,573
Arkell Swine	512,200	20,000	212,500	319,700
Elora Beef	1,598,874	46,070	59,125	1,585,819
Elora Dairy	901,300	169,500	5,500	1,065,300
Elora Plant Ag.	2,703,025	33,000	370,550	2,365,475
Emo	80,500	-	-	80,500
Guelph Research Station Operations	2,999,097	281,035	302,000	2,978,132
Guelph Turfgrass	75,955	6,000	-	81,955
Isolation Unit	12,600	-	-	12,600
Kemptville College	1,621,766	79,800	-	1,701,566
Bradford Muck Stn	243,189	10,000	-	253,189
NLARS	927,834	9,600	15,000	922,434
Ponsonby Dairy	391,430	24,600	11,500	404,530
PGAF	147,364	15,600	13,470	149,494
Ponsonby Sheep	109,720	42,370	13,000	139,090
Ridgetown College	5,336,788	1,052,815	263,395	6,126,208
Simcoe	600,900	25,000	-	625,900
Thunder Bay	78,500	-	-	78,500
Woodstock	449,365	74,500	8,000	515,865
Vineland	2,839,368	53,369	383,900	2,508,837
Lab Services	22,950,197	1,971,704	1,252,078	23,669,823

<u>Library Resources</u>	
<u>Location</u>	<u>Replacement Value \$ ('000)</u>
Alfred	786
Kemptonville	1,163
Ridgetown	1,236

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8. INVENTORY AND RENTS OF DWELLING HOUSES STATUS

Kemptville College

Units

Kemptville	1	
New Liskeard	<u>3</u>	
Total	4	
Revenue		16,412
Expenses		<u>12,050</u>

Account balance: Opening 59,261
Closing 63,623

Ridgetown College

Ridgetown	2	
Cedar Springs	<u>1</u>	
Total	3	
Revenue		21,886
Expenses		<u>6,926</u>

Account balance: Opening 34,418
Closing 49,378

Guelph Stations

Ariss	3	
Alma	1	
Hall House	1	
Ponsonby	1	
Arkell	3	
Simcoe	1	
Vineland	<u>2</u>	
Total	12	
Revenue		58,800
Expenses		<u>81,919</u>

Account balance: Opening 8,110
Closing (15,009)

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9. LIVESTOCK INVENTORIES

	OPENING MAY 1, 2006	SOLD	DIED ⁽¹⁾	TRANSFERRED		BORN OR ACQUIRED	CLOSING APRIL 30, 2007
				IN	OUT		
ALFRED							
DAIRY	66	34	6	0	0	61	87
KEMPTVILLE							
DAIRY	69	93	10	0	0	102	68
NEW LISKEARD							
BEEF	350	166	6	0	0	161	339
RIDGETOWN							
DAIRY	66	34	1	0	0	40	71
BEEF	27	8	1	0	0	12	30
SWINE	385	973	70	18	4	982	338
GUELPH							
ARKELL EQUINE	65	2	1	172	180	14	68
ARKELL POULTRY	6,376	3,388	4,373	425	2,106	10,287	7,221
ARKELL SWINE	1,448	3,854	1,832	0	436	6,450	1,776
ALMA AQUA	73,636	30,797	35,144	10,946	14,379	74,605	78,867
ELORA DAIRY	295	84	42	60	93	152	288
ELORA BEEF	521	292	15	57	23	250	498
PONSONBY DAIRY	92	40	12	50	70	68	88
PONSONBY (GAF) ⁽²⁾	112	192	7	106	23	90	86
PONSONBY SHEEP	317	276	19	0	101	364	285
CLINICAL STUDIES							
DAIRY	79	22	0	39	34	0	62
SWINE	43	32	109	108	0	0	10
SHEEP	76	47	31	91	57	0	32

⁽¹⁾ These figures include animals that are born dead and those which are euthanized for humane, disease and research reasons.

⁽²⁾ General Animal Facility

10. ACRONYMS

AAFC	Agriculture and Agri-Food Canada
AFL	Agriculture and Food Lab
AHL	Animal Health Laboratory
ARIO	Agricultural Research Institute of Ontario
AVMA	American Veterinary Medical Association
BDO	Business Development Office
BDT	Business Development and Training
CCAC	Canadian Council of Animal Care
CE	Continuing Education
CEP	Clinical Education Program
CEU	Continuing Education Units
CFI	Canadian Foundation for Innovation
CIDA	Canadian International Development Agency
CVMA	Canadian Veterinary Medical Association
CVO	College of Veterinarians of Ontario
DFO	Dairy Farmers of Ontario
DVM	Doctor of Veterinary Medicine
DVSc	Doctor of Veterinary Science
EHS	Environmental Health & Safety
ERP	Emergency Response Plan
FTE	Full Time Equivalent
GHG	Greenhouse Gas
GLP	Good Laboratory Practices
GMP	Good Manufacturing Practices
HACCP	Hazard Analysis and Critical Control Point
HQP	Highly Qualified Personnel
IP	Intellectual Property
IPM	Integrated Pest Management
LIMS	Laboratory Information Management System
LOI	Letter of Intent
LS	Laboratory Services Division
MOE	Ministry of the Environment
MTCU	Ministry Training, Colleges and Universities
NLARS	New Liskeard Agricultural Research Station
OABA	Ontario Agri Business Association
OAC	Ontario Agricultural College
OARC	Ontario Agricultural Research Council
OASCC	Ontario Agricultural Services Coordinating Committee
OAVT	Ontario Association of Veterinary Technicians
OIT	Ontario Innovation Trust
O&M	Operations and Maintenance
OMAFRA	Ontario Ministry of Agriculture, Food and Rural Affairs
OPEP	Ontario Pesticide Education Program
ORC	Ontario Realty Corporation
OVC	Ontario Veterinary College
OVCTH	Ontario Veterinary College Teaching Hospital
OYAP	Ontario Youth Apprenticeship Program
PCR	Polymerase Chain Reaction
PI	Principle Investigator
PMA	Performance Measures Agreement
RFP	Request for Proposal
RME	Resource Management and Environment
RSSA	Research Station Service Access
SPARK	Students Promoting Awareness of Research Knowledge

SPS	Sustainable Production Systems
SRC	Sustainable Rural Communities
TDA	Training Delivery Agency
U of G	University of Guelph
VCEP	Veterinary Clinical Education Program
VMOA	Veterinary Medical Office Administration