



the
Food
Inventory



UNIVERSITY
of **GUELPH**



2000



Introduction

Believing in Canada's agri-food future

Honouring the scientists who have dedicated their lives to the food we eat, and supporting our regional growers, is much more than a culinary event...it's a statement of our belief in Canada's agri-food future.

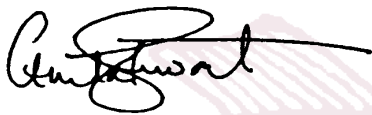
The University of Guelph Food Inventory is a first for any university in Canada. It was created to showcase some of the foods that have been developed and enhanced by researchers at the University of Guelph and its affiliates across the province. From the wheat milled for pastries to the barley malted for beer, the inventory highlights an extraordinary part of the University of Guelph's fabulous story.

As a food writer and culinary activist, I believe it is crucial for Canadians to begin to understand how closely we all are touched by the hundreds of success stories that have sprung from University of Guelph research. These researchers are the men and women who set our national (and often international) tables every day. They clearly demonstrate that support for research is a sound, practical investment.

This inventory is a colourful snapshot of a variety of accomplishments. As the new millennium approaches, and as research intensifies, the inventory will continue to grow. It is and will be a constant work in progress, expanding steadily as researchers continue developing new varieties and techniques. And just as it has done in the past, the University will help to feed the world...with style and pride.

Join me in honouring the past, tasting the present and celebrating the future!

Sincerely,



Anita Stewart

p.s. - Thanks to University of Guelph President Mordechai Rozanski and Ontario Agricultural College Dean Rob McLaughlin for their hearty endorsement and encouragement for this project, and to Prof. Rickey Yada, chair of the Department of Food Science, and Owen Roberts, head of research communications, for their assistance and direction.



Basket of Gold: Food Science Prof. Rickey Yada (left) and Food Inventory co-ordinator Anita Stewart (standing) show off a basket of Yukon Gold potatoes bred by Gary Johnston (seated). Read more about the Yukon Gold potato on page 15.

MARTIN SCHWALBE

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The University of Guelph Food Inventory 2000 is produced by the Office of Research, University of Guelph. The support of our research sponsors is gratefully acknowledged.

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Spring 2000
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Stories for the *Food Inventory 2000* were written by participants in SPARK — Students Promoting Awareness of Research Knowledge — a student research-writing program in the Office of Research. SPARK is sponsored by: Agriculture and Agri-Food Canada, Agricultural Adaptation Council, Ontario Research Enhancement Program, Canadian Food Inspection Agency, Canadian International Development Agency, Canadian Network of Toxicology Centres, College of Social and Applied Human Sciences, Developing Countries Farm Radio Network, First Line Seeds, Guelph Mercury, Country Guide Ontario, Kahntact Marketing, Laboratory Services, Natural Sciences and Engineering Research Council, Ontario Agricultural College, Ontario Ministry of Agriculture, Food and Rural Affairs, Ontario Veterinary College, Pioneer Hi-Bred Limited, Ontario Pork, the Dairy Farmers of Ontario and GROWMARK, Inc.

Meat & Alternatives

Vitamin E makes fine swine

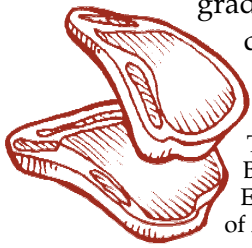
Pork would be more popular on restaurant menus if it could be precooked and frozen without taking on a rancid flavour. Vern Osborne of Ridgetown College and colleagues Profs. Roger Hacker and Jim Squires, Department of Animal and Poultry Science, have found that feeding pigs Vitamin E supplements stops precooked pork from tasting rancid...and prolongs the shelf life of fresh pork by two days. Integrated companies, such as Maple Leaf Foods, now feed pigs Vitamin E. China, wanting to boost pork exports to Japan, has recently made inquiries to the University.



This research was sponsored by the Ontario Ministry of Agriculture, Food and Rural Affairs' Animal Research Program, Hoffman-LaRoche and Schneiders.

Processed meat with lower salt

Adding salt to meat bonds it together and creates a texture and taste that consumers like. But cardiologists and nutritionists warn that high levels of salt can be bad for some people's health. Researchers tackled this problem by developing a method for extracting proteins from lower-grade meat cuts and using them to bind the small ground pieces of meat used for hot dogs and sausages. Starch and seaweed gums are also used as binding agents. This technology has been widely adopted by industry in Canada and the United States.

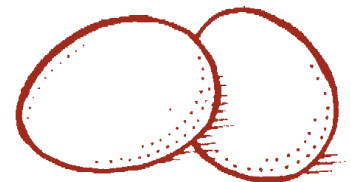


This research was conducted by food science professor David Stanley, now retired, and Prof. Shai Barbut, Animal and Poultry Science. Their work was sponsored by the Natural Sciences and Engineering Research Council, the Ontario Cattlemen's Association, industry, and the Ontario Ministry of Agriculture, Food and Rural Affairs.

Omega-3 eggs take your health to heart

Omega-3 eggs are making breakfast healthier than ever. Researchers discovered that hens fed a flaxseed diet produce eggs high in omega-3 fatty acids. Their eggs then become a convenient vehicle for people to meet their daily omega-3 requirements. In 1997, Health Canada recognized these fats as anti-heart disease compounds. Consumers have caught on: sales of omega-3 enriched Bon-EE-Best NaturEggs are growing steadily.

The flaxseed feed was developed by Prof. Steve Leeson and research associate Linda Caston, Animal and Poultry Science. Part of this research was sponsored by the Flax Council of Canada.



Meat & Alternatives



Fishing in new territory

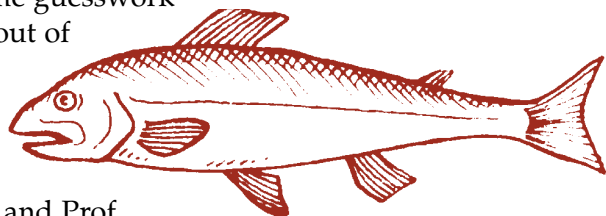
The introduction of domestically raised arctic charr to the Ontario marketplace will speed up now that some of the guesswork

has been taken out of nutrition programs for the species.

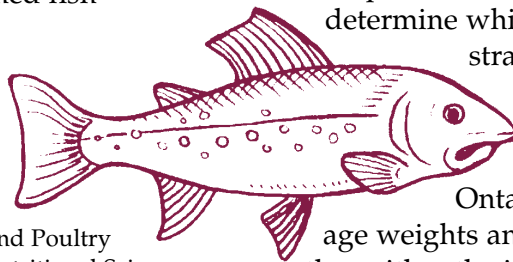
Researchers

Richard Gurure and Prof.

Richard Moccia, Animal and Poultry Science, zeroed in on charr nutrition because fish farmers were mostly feeding charr diets developed for other fish species — there was no information on the requirements of this newly cultured species. Through computer modeling, the researchers estimated the species' needs and applied these to the formulation of diets for charr. This modeling approach pulls together dietary information from a variety of sources and is designed to reduce a number of expensive feeding experiments needed to improve the accuracy of feed formulation and manufacturing for newly farmed fish species.



Graduate student Lincoln Simmons has completed related studies on diet requirements, and Prof. John Cant, Animal and Poultry Science, assisted in the evaluation and improvements of existing computer diet models. Other faculty involved were Profs. Jim Atkinson, Steve Leeson and Kees de Lange, Animal and Poultry Science, and Prof. Young Cho, Human Biology and Nutritional Sciences. This research was sponsored by the Ontario Ministry of Agriculture, Food and Rural Affairs.

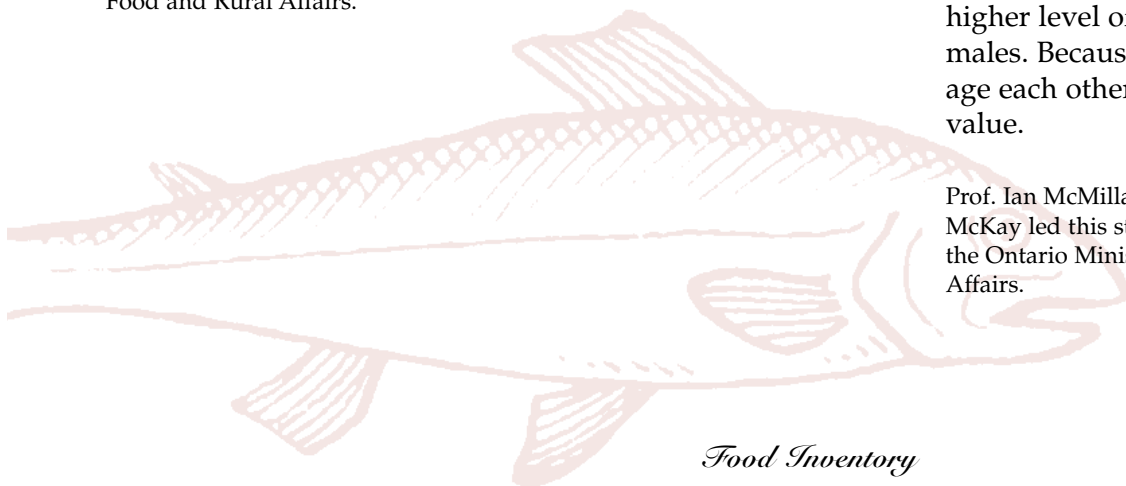


There's no place like home for trout

Year-round aquaculture is headed this way, with the help of Ontario-raised commercial strains of spring-spawned rainbow trout. Researchers monitored the development of three Ontario strains and one imported strain of rainbow trout to determine which spring-spawning strains would best complement existing fall/winter-spawning programs.

Commercial strains from Ontario exhibited higher average weights and lower mortality rates than either the imported or non-commercial strains. The imported strain also had a higher level of sexual maturation among males. Because mature males fight and damage each other, this lowers their commercial value.

Prof. Ian McMillan and research associate Laura McKay led this study. Their work was sponsored by the Ontario Ministry of Agriculture, Food and Rural Affairs.



Meat & Alternatives

Exotic nuts from domestic places

North America's hunger for exotic nuts is supplied mainly through imports. It's a growing market as consumers learn more about the health-related benefits of certain nut varieties. Ontario's fledgling nut industry is getting a boost from researcher Alan McKeown, who is evaluating establishment techniques for the Chinese chestnut and three different cultivars of Japanese heart nuts. McKeown has found heart nuts establish well in southern Ontario's temperate climate and will produce a light crop in the next couple of years.

Alan McKeown conducts his research at the Department of Plant Agriculture's Simcoe Research Station. This research is co-sponsored by the Commercial Nut Growers' Association of Ontario and the Ontario Ministry of Agriculture, Food and Rural Affairs.

Garroy gives a bite-size bonus

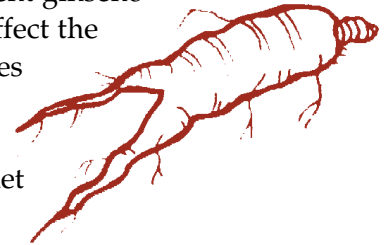
The Department of Plant Agriculture's peanut-breeding program has produced some unique-looking peanuts — with skins of white to pale green and red, and nuts that are striped black, red and white. The OAC Garroy is the most widely grown peanut in Ontario. It's a sweet red-skinned nut that not only tastes great, but produces up to four peanuts per shell.



This research was led by Prof. Tom Michaels and sponsored mainly by the Ontario Ministry of Agriculture, Food and Rural Affairs. The land for growing the peanuts was provided by Agriculture and Agri-Food Canada and Kernal Peanuts.

Rooting out ginseng's many virtues

The most commercially important part of the ginseng plant is the root, but the plant naturally diverts valuable energy towards flower development. Prof. John Proctor, Plant Agriculture, discovered that a growth regulator called Ethrel can be applied to open ginseng flowers, causing the plant to lose them and ultimately helping the root develop better and faster. Proctor found that root size, shape and colour, along with the quality of the medicinal ingredient ginsenoside found in the root, affect the plant's value. That makes root growth all the more important, particularly because the export market alone brings in approximately \$80 million to Ontario growers.



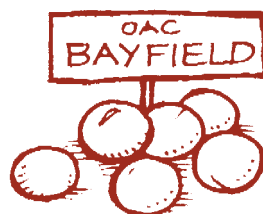
This research is sponsored by the Ontario Ministry of Agriculture, Food and Rural Affairs, Agriculture and Agri-Food Canada, the National Research Council through the Industrial Research Assistance Program, the Natural Sciences and Engineering Research Council, and Rhone-Poulenc.

Meat & Alternatives

Bayfield is a mighty bean

The Ontario Agricultural College soybean-breeding program has produced many new varieties, but the OAC Bayfield is the cream of the crop. When first tested, it out-yielded existing varieties by 15 per cent and showed good lodging and white mold resistance. This variety also turned out to be widely adapted across a large geographic area that stretching from the Ottawa Valley to Lake Huron. According to the Canadian Seed Growers' Association, OAC Bayfield was grown on 400,000 acres in Ontario in 1998, representing 20 per cent of the total soybean acreage in the province and the biggest acreage ever for a soybean variety in Ontario.

This research was completed by Prof. Jack Tanner, retired head of the OAC soybean-breeding program. This research was sponsored by the Ontario Ministry of Agriculture, Food and Rural Affairs and the Ontario Soybean Growers' Marketing Board.



Erin fares the best of all

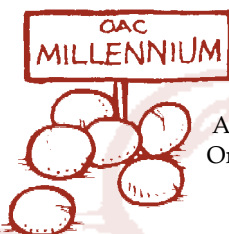
Out of the traditional soybean-breeding program has come another superior soybean, OAC Erin. It was registered in 1996 and two years later had managed to produce higher yields than all other soybean varieties in southern Manitoba. OAC Erin matures five days earlier than OAC Bayfield and has better lodging and white mould tolerance. More significant, OAC Erin has a yellow hylum that makes it acceptable for food-grade soybean production.

OAC Erin was developed through the combined efforts of Profs. Jack Tanner and Bruce Luzzi, Plant Agriculture. This research was sponsored by the Ontario Ministry of Agriculture, Food and Rural Affairs and the Ontario Soybean Growers' Marketing Board.



A soybean for the new millennium

OAC Millennium is leading soybeans into the next century. Not only does this variety boast higher yields than the benchmark soybean, OAC Bayfield, but it matures earlier as well. OAC Millennium has very good tolerance to white mould and was the first OAC variety whose marketing rights were put out for tender. PRO Seeds of Canada has marketing rights to OAC Millennium, which was registered in 1997 and has succeeded in making inroads into the United States.



OAC Millennium was developed through the combined efforts of Profs. Jack Tanner and Bruce Luzzi, Plant Agriculture. This research was sponsored by the Ontario Ministry of Agriculture, Food and Rural Affairs and the Ontario Soybean Growers' Marketing Board.

Meat & Alternatives

OAC 211: where soybeans began in Canada

Charles Zavitz, a graduate of the first degree class of the Ontario Agricultural College and a professor at the college for 35 years, pioneered the introduction of soybeans to Ontario. In 1918, he made 34 selections from 10,000 plants of his introduction variety, Harboro No. 10405. The progeny of 22 of these lines was tested, and the one line with the highest yield was put in regular variety trials in 1921. It beat all other varieties for grain yield and was second in fodder production. On Aug. 26, 1925, it was designated OAC 211 and became the first soybean variety registered in Canada.




Helping prevent human disease

Besides being high in protein, soybeans contain a unique group of compounds called isoflavones, which clinical studies have shown to be active agents in the prevention of breast, colon and prostate cancer, atherosclerosis and osteoporosis. Scientists at the Guelph Centre for Functional Foods have identified the isoflavone levels of 13 Ontario-grown varieties through a highly sophisticated procedure developed at the centre. This identification will be helpful in determining which varieties take on specific disease-prevention roles.

The departments of Food Science and Human Biology and Nutritional Sciences work co-operatively on this project with scientists at the Guelph Centre for Functional Foods. It also involves collaborations with Agriculture and Agri-Food Canada, and the universities of Toronto and Western Ontario. This research was sponsored by the Ontario Ministry of Agriculture, Food and Rural Affairs, Maple Leaf Foods Inc., and the Ontario Soybean Growers' Marketing Board (which is continuing its support).

Meat & Alternatives


Super seeds make super sense



Legume seeds such as peas, beans, chick peas and lentils are achieving “super” status. Prof. Praveen Saxena, Plant Agriculture, has found a way to create a single seed capable of producing multiple (up to 400) plants. Typically, legumes do not respond well to traditional propagation methods, but Saxena’s breakthrough process of hyperproduction of plantlets *in vitro* allows mass production. This discovery has enabled the economically efficient mass propagation of new legume varieties, which are good sources of protein and highly popular among health-conscious consumers.

Prof. Praveen Saxena’s research partner on this project was graduate student Kamal Malik. This study was sponsored by the Natural Sciences and Engineering Research Council.

Direct harvest means top production



OAC Laser and OAC Thunder are stealing the white bean scene, accounting for more than half of the white bean acreage in Ontario. OAC Laser, introduced in 1991, is highly acclaimed for its disease resistance, tall stature and thin branches. These qualities prompted a new production technique known as direct harvest, a more efficient means of collecting the beans. OAC Thunder, made commercially available in 1998, contains the same characteristics, but offers higher yields.

Prof. Tom Michaels, Plant Agriculture, has led this research since 1982. It was sponsored mainly by the Ontario Soybean Growers’ Marketing Board, the Natural Sciences and Engineering Research Council and Agriculture and Agri-Food Canada through partnership grants.

Meat & Alternatives

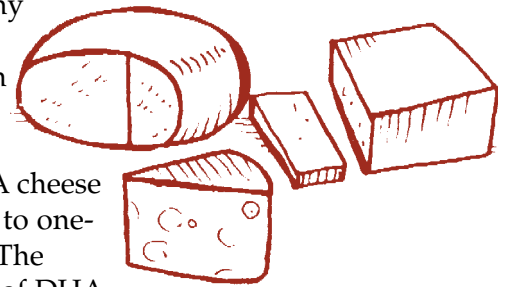
Milk that does a body better

Cow's milk is being kicked up a nutritional notch. By giving cows a specially developed feed containing docosahexaenoic acid (DHA), an essential nutrient for visual acuity and optimal mental functioning, Profs. Brian McBride, Bruce Holub and graduate student Tom Wright have found a way to provide consumers with an important element missing in many people's diets. DHA milk contains a much lower fat concentration than regular milk and is now being used to make low-fat cheese and butter. Patents for the process have been granted in the United States and are pending in Europe.



Cheese gets a nutritional boost

Prof. Arthur Hill, Food Science, has put cheese on a diet. By giving cows a diet enriched with Omega-3 fatty acids, docosahexaenoic acid (DHA) in the milk becomes a natural source of DHA in the cheese. This provides consumers with a uniquely healthy product. DHA milk is lower in fat which reduces the fat content of DHA cheese by one-quarter to one-third per cent. The health benefits of DHA include optimal mental functioning and visual acuity, enrichment of heart tissue and reduced chances of cardiac arrest, positive effects on depression and attention-deficit disorders, and protection against breast cancer in postmenopausal women.



Prof. Brian McBride and Tom Wright are from the Department of Animal and Poultry Science and Prof. Bruce Holub is a member of the Department of Human Biology and Nutritional Sciences. Their research was sponsored by the Natural Sciences and Engineering Research Council and the Ontario Ministry of Agriculture, Food and Rural Affairs.

This research is sponsored by the Dairy Farmers of Ontario and the Grow Ontario Research Program.

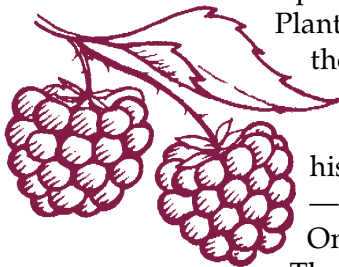
Canola spread is on solid ground

Saturated fats and trans fatty acids are two major contributors to cardiovascular disease. For those wanting to trim these unhealthy fats from their diets, Prof. Yukio Kakuda, Food Science, has created a margarine consisting of 95 per cent liquid canola oil, five per cent added hard fraction and less than 0.1 per cent trans fatty acids. The challenge was to turn a mixture with such a high liquid oil content into a semi-solid fat. Results are promising and sales estimates are encouraging, considering there are only a few other major producer of low saturated-fat margarines on the market. A provisional patent application has been filed.

Prof. Kakuda was assisted by PhD student Firouz Jahani-Aval. This research was sponsored by the Ontario Ministry of Agriculture, Food and Rural Affairs and Caravelle Foods.

A berry that goes for the gold

Out of a traditional plant-breeding program has come a raspberry that's pure gold — both in colour and anticipated consumer acceptance. Prof. Alan Sullivan, Plant Agriculture, developed the golden raspberry selection from a warm-climate cross — including his exciting “megaberry” — and is adapting it to Ontario's cooler climate.



The berry's scarcity, unique colour and intense flavour are expected to be popular among consumers. The golden berry should hit growers' fields by the beginning of the new millennium.

This research was conducted at the Cambridge Research Station and was sponsored by the Ontario Ministry of Agriculture, Food and Rural Affairs and the Ontario Berry Growers Association.

Currants make a disease-resistant comeback

The tasty, vitamin-packed black currant is making a comeback in Ontario. Despite being native to Canadian woodlots, black currants grow in limited numbers here because of their susceptibility to powdery mildew, a condition that devastates the crop. But two new cultivars, Ben Alder and Ben Sarek, are resistant to the disease and were made available to producers in 1999 by the Ontario Berry Growers Association. With a huge market for black currants in Europe —

and a ban on their production in many areas in the United States because of the concern they'll spread white pine blister rust to other plants — these new disease-resistant varieties could mean big sales for Ontario growers.



The black currant cultivars were tested and made available in Ontario by Adam Dale and Sam Wong of the Simcoe and Vineland Research Stations. This research is sponsored by the Ontario Ministry of Agriculture, Food and Rural Affairs and the Ontario Berry Growers Association.

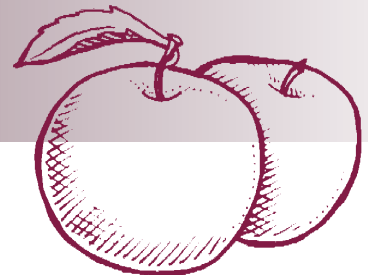
Megaberries are a giant success

Jumbo raspberries are destined to be a *big* hit with consumers. These berries tip the scales at up to 6.5 grams, compared with only 1.7 to 2.5 grams reached by conventional raspberries. They're the result of combining the best characteristics of hardy Ontario cultivars — which can withstand both summer heat and winter cold — with traits from the kinder climates of British Columbia or Scotland.

Prof. Alan Sullivan heads the raspberry-breeding program and conducts his research at the Cambridge Research Station, along with technician Sue Couling. This research was supported by the Ontario Ministry of Agriculture, Food and Rural Affairs and the Ontario Berry Growers Association.



Fruit



Apple trees under construction

Better-built “designer” apple trees mean better apples for Ontario. The province’s specific climates, soil types and growing conditions mean some varieties do better than others, but the hardiest may not be the most productive or most disease resistant. So researchers are combining 150 standards with new Canadian and global apple cultivars — such as Empire, Royal Gala and Honeycrisp — with 30 different kinds of rootstocks, including the Vineland series of rootstock, to construct ideal trees. They’re looking at size, shape, precocity and overall productivity, choosing the appropriate traits for optimal growth and improved orchard efficiency.

Researcher John Cline and technician Mary Byl are based at the Simcoe Research Station. This research is sponsored by the Ontario Ministry of Agriculture, Food and Rural Affairs Plants Program, the Ontario Apple Marketing Commission, and the Industrial Research Assistance Program.

Better bees resist disease

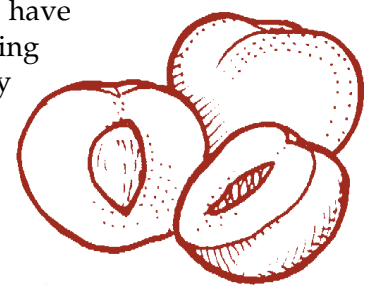
Canada’s bee colonies have been improving, thanks to the University of Guelph’s beekeeping program. Over the past decade, several bordering U.S. states have suffered great losses in their bee colonies due to infection by tracheal mites. But in Canada, bees have been bred to carry resistance to these mites, which destroy entire bee colonies. Not only does mite resistance boost the Canadian honey industry, the fruit and vegetable industries gain as well because bees are crucial for pollinating these crops. In Ontario alone, it is estimated that 30 per cent of all food on the dining table requires pollination with a dollar value of 90 million.



This research was conducted by Profs. Gard Otis and Cynthia Scott-Dupree, Dr. Medhat Nasr and research technician Paul Kelly. This research was sponsored by the Ontario Ministry of Agriculture, Food and Rural Affairs.

A sweet deal for peach processing

Peach-breeding techniques developed by researcher Neil Miles have extended the processing peach harvesting season by a month. And that’s sweet music for peach processing plants. They’ll no longer be limited to a stressful and intense two-week period for canning peaches. Managerial practices and research on peach genetics have also improved disease resistance and boosted yields of Ontario peaches, which means reduced costs to peach producers and ultimately to consumers.



This research was conducted at the Vineland Research Station and was sponsored by Agriculture and Agri-Food Canada through the CanAdapt program (administered by the Agricultural Adaptation Council), the Ontario Tender Fruit Producers Marketing Board, the Ontario Ministry of Agriculture, Food and Rural Affairs, Nabisco Ltd., and Gerber Foods.

Fruit



The cherry that tops them all: Tehranivee

A 30-year cross-breeding program has produced a cherry variety that tops them all. The Tehranivee is named in honour of Dr. Gus Tehrani who developed the cherry. Tehranivee shows several remarkable qualities. It yields large, mahogany coloured, flat-round fruit with black-red juice considerably sweeter than its check variety, the Hedelfingen. The Tehranivee also offers high productivity and moderate resistance to insects, disease and rain-induced splitting. And like its parent Stella, the Tehranivee is self-fertile, which eliminates the need for pollination by other varieties. The Tehranivee is available in Canada, the United States, Australia and France through licensed nurseries.

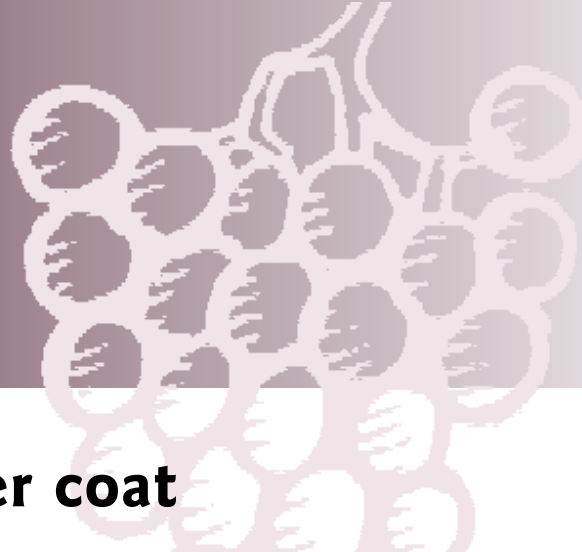
Technician Bill Lay helped Dr. Tehrani evaluate, test and select this variety. This research was conducted at the Vineland Research Station and was sponsored by the Ontario Ministry of Agriculture, Food and Rural Affairs.



Van and Stella...a tasty twosome

Van and Stella are two of the sweetest, largest and firmest cherry cultivars ever bred. The late Dr. Gus Tehrani used Van and Stella as a basis for developing several other popular varieties. The 1996 introduction of the Vandalay cherry, named in recognition of technician Bill Lay's 25 years of service to the cherry program, became one of Van and Stella's crowning achievements. The Vandalay produces large, wine-red, kidney-shaped cherries with purple juice that's sweeter than the industry standard. The variety is now available through licensed nurseries in Canada, the United States, Australia and France.

Technician Bill Lay helped Dr. Tehrani complete years of evaluation, selection and testing. This research was conducted at the Vineland Research Station and was sponsored by the Ontario Ministry of Agriculture, Food and Rural Affairs.



Grapevines get a winter coat

Transgenic grapevines could revolutionize the grape and wine industries in Canada by providing a “winter coat” for the temperature-sensitive fruit. Research to boost the range of survival of the Chardonnay and Cabernet Franc varieties could have enormous economic benefits. This new transgenic technique could be applied to almost all perennial fruit crops and winter annual plants growing in a cold climate. Testing started in 1997 and is underway in the field now, to determine the grapevines’ degree of winter-hardiness.



This grape variety was developed by Prof. Bryan McKersie, Plant Agriculture, with the help of students Brenda Rojas and Tawnya MacNeil, in conjunction with Château des Charmes research scientist John Paroschy. The grape cells were grown at the Guelph Transgenic Plant Research Complex and experiments were approved by The Canadian Food Inspection Agency. This, and other research in McKersie’s lab, was sponsored by the Natural Sciences and Engineering Research Council, the Ontario Ministry of Agriculture, Food and Rural Affairs, Performance Plants, Pioneer Hi-Bred Limited, Château des Charmes, the Ontario Forage Council, the Dairy Farmers of Ontario, and the National Research Council through the Industrial Research Assistance Program.

No sour grapes with new wine yeast

The malic acid content found in grapes gives wine a distinct acidic flavour. But if not adjusted during fermentation or production, excess acid from unripe grapes can make the wine sour. It can also lead to spoiling from bacterial fermentation after the wine has been bottled. To correct this problem, Prof. Ron Subden has helped create two new strains of wine yeast, one that efficiently converts the malic acid into lactic acid, and another that converts the acid into ethanol during fermentation. A contract has been negotiated for worldwide commercialization of the strains, and a license for its production has been sold to one of the largest wine yeast companies in the world, located in France.

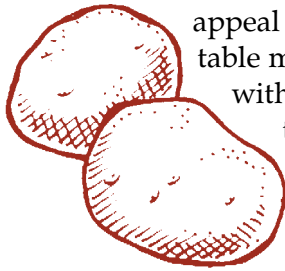


Prof. Subden worked in partnership with Heinrich Van Vurren of the University of Stellenbosch in South Africa. Their research was sponsored by the National Research Council.

Vegetables

A gem of a spud

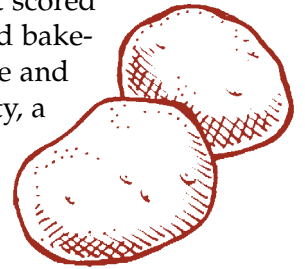
The traditional potato-breeding program has unearthed a gem — the Ruby Gold. The name of this yellow-fleshed spud is fitting because of its red-coloured skin, which is finding appeal with restaurateurs and fresh-table markets. It's gaining popularity with consumers and is excellent table stock. Ruby Gold excels in dry-matter content and bake-and-boil scores and is selling well.



Field tests were conducted at the Cambridge Research Station and were sponsored by Agriculture and Agri-Food Canada and the Ontario Ministry of Agriculture, Food and Rural Affairs. Potato program leader Tahir Ali-Khan and research associate Vanessa Currie of the Department of Plant Agriculture selected the Ruby Gold for registration.

Royal tubers from the Royal City

Guelph is often called the Royal City — and now it has its own “royal” potato. The Royal Gold, with its purple skin and yellow flesh, is an eye-catching favourite among local restaurateurs and is popular in special niche markets. This tuber does well as a cooking potato. It scored higher in dry-matter content and bake-and-boil tests (a measure of taste and texture) than the Chieftan variety, a popular potato grown in Ontario.



Field tests were conducted at the Cambridge Research Station and were sponsored by Agriculture and Agri-Food Canada and the Ontario Ministry of Agriculture, Food and Rural Affairs. Potato program leader Tahir Ali-Khan and research associate Vanessa Currie of the Department of Plant Agriculture selected the Royal Gold for registration.

Yukon Gold sets international standards

The famous Yukon Gold potato stemmed from a potato-breeding program that started in 1946. A research team led by Gary Johnston developed the potato in response to requests from European immigrants accustomed to eating yellow-fleshed varieties. After years of experimentation, Johnston crossbred a white-fleshed North American potato with a wild South American yellow-fleshed variety, and the result was the first Canadian-bred potato to be promoted and marketed by name. The Yukon Gold's nutty flavour and distinctive colour have led to a steady increase in its popularity both domestically and internationally. In fact, the potato was part of the White House state dinner given in October 1997 by U.S. President Bill Clinton for China's President Jiang Zemin.

The potato-breeding program was sponsored by Agriculture and Agri-Food Canada.

Vegetables

The early Eramosa serves producers and consumers

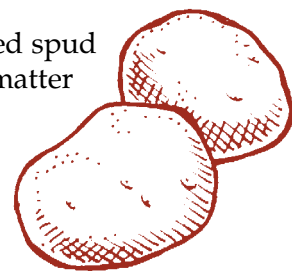


The Eramosa potato is Ontario's earliest-maturing potato variety. The white-skinned, white-fleshed spud starts yielding in as little as 70 days — a full five to seven days before the other earliest varieties available in Ontario. Not only is the Eramosa ideal for boiling, but this early-maturing variety also makes farmers money. Potatoes are usually worth about twice as much in their first week on the market than the second week, when the market is swamped.

The Eramosa potato was developed by Robert Coffin, the Agriculture and Agri-Food Canada (AAFC)-sponsored potato breeder formerly stationed at the University of Guelph. This research was assisted by technician Mary Kay Keenan and sponsored by AAFC, the Ontario Ministry of Agriculture, Food and Rural Affairs, the Ontario Potato Marketing Board, the Ontario Potato Cultivar Evaluation Association and the Canadian Potato Chip and Snack Food Association.

If it's flashy . . . it's the Temagami

Temagami, a flashy red-skinned, white-fleshed spud is chalking up scores with its superior dry-matter content, bake-and-boil qualities and yields compared with the popular check variety, the Chieftain potato. Temagami's red-and-white look makes it appealing to restaurateurs and fresh-table markets.



Field tests for Temagami were conducted at the Cambridge Research Station. This research was sponsored by Agriculture and Agri-Food Canada and the Ontario Ministry of Agriculture, Food and Rural Affairs. Potato program leader Tahir Ali-Khan and research associate Vanessa Currie of the Department of Plant Agriculture selected Temagami for registration.

Vegetables



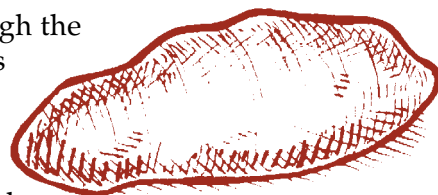
Asparagus for the new millennium

The new millennium has arrived for asparagus. Prof. Dave Wolyn, Plant Agriculture, has created a new variety of asparagus called the Guelph Millennium. It's an all-male hybrid — male asparagus typically yields up to 25 per cent more than female plants — that out-yields the standard variety by as much as 40 per cent. Millennium was first made commercially available in the winter of 1999; its seed stock sold out in months.

The early stages of this research were conducted at the Cambridge Research Station, and the advanced stages were completed at the Simcoe Research Station. This research was sponsored by the Ontario Asparagus Growers Marketing Board, Agriculture and Agri-Food Canada through the CanAdapt program (administered by the Ontario Agricultural Adaptation Council), the Natural Sciences and Engineering Research Council, and the National Research Council through the Industrial Research Assistance Program.

Sweet potatoes sprout in the tobacco belt

Ontario's tobacco industry has another new alternative crop to fill the coarse, sandy soils of the tobacco belt — sweet potatoes. Although the vitamin-rich vegetables are typically grown in warm climates, researcher Alan McKeown has managed to adapt certain varieties to Ontario's colder climate. So far, two varieties have proved viable — Beauregard and NC9317. They produce high yields and are adapted to the coarse soils.



Alan McKeown is an associate professor in vegetable physiology at the Simcoe Research Station. This research is sponsored by the Ontario Ministry of Agriculture, Food and Rural Affairs.



Grains

The granddad of malting barleys

OAC 21 barley revolutionized the barley industry in Canada, thanks to professor Charles Zavitz. He obtained the superior-yielding and well-adapted Mandscheuri barley line from Russia in 1889, evaluated seed from the 33 best lines at the Ontario Agricultural College and eventually selected line number 21 which was released in 1910. Under the name OAC 21, it soon became the dominant barley in the province, constituting 98 per cent of the barley acreage in Ontario in the 1920s. Its use expanded into Western Canada, where it became the dominant variety. OAC 21 also showed exceptional malting qualities and was the preferred variety for beer making in Canada for more than 50 years. OAC 21 has been used as a parent in developing new varieties with good malting characteristics in Canada, U.S.A. and as far afield as Scandinavia and South America. In fact, most modern Canadian barley varieties here trace their parentage to OAC 21.



Oatstanding in its field

In 1995, the OAC Paisley was registered and recognized as a great oat with high yielding capabilities, after it out-yielded the next best performer by four per cent. In 1999, OAC Paisley remained the highest yielding oat in the province. With excellent lodging resistance, OAC Paisley is very popular and it is increasingly being used in mixed grain with barley, due to its high yield and ability to remain standing as it matures.



OAC Paisley was developed by Prof. Duane Falk and his team of the Ontario Ministry of Agriculture, Food and Rural Affairs Oat Breeding Group. This research was sponsored by the Ontario Ministry of Agriculture, Foods and Rural Affairs.

Backed by the best

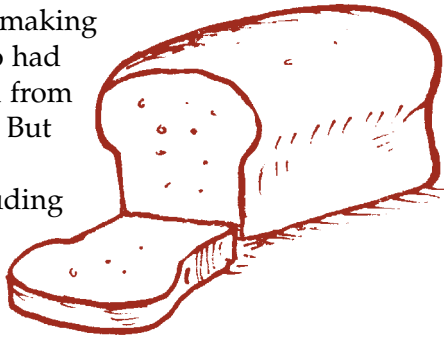
Imagine the ideal barley, containing the best characteristics from three superior parent varieties — high yields, large seeds, and high bushel weight. In addition, it has better disease resistance than any of the parental varieties, and better lodging resistance without sacrificing stalk height. That's OAC Baxter, produced by plant agriculture professor Duane Falk. Seed stock development has been accelerated through winter nurseries in California to give commercial quantities for the next planting season.

The C&M Seed Company assisted in evaluating this new variety and has obtained its marketing rights. Research leading to its development was sponsored by the Ontario Ministry of Agriculture, Food and Rural Affairs.

Grains

Hard red for bread

At one time, all wheat used for bread-making in Ontario had to be transported from Western Canada. But then Ontario researchers, including Prof. Tony Hunt, Plant Agriculture, introduced hard red wheat cultivars adapted to Ontario conditions. The Fundulea wheat cultivar in particular, developed in Romania, was introduced here and now meets a portion of the bread wheat requirements with local production. Bread-making varieties are now being developed in Ontario, and there appears to be good potential for the production of quality bread wheats in the province.



This research was sponsored by the Ontario Ministry of Agriculture, Food and Rural Affairs and the Ontario Wheat Producers' Marketing Board.

Ontario strikes oil with cold-hardy canola

Canada's global leadership in canola development and stress tolerance in plants is taking another step forward. Plant agriculture professor Laima Kott, a canola pioneer, is introducing greater cold tolerance into winter canola varieties. Acropolis and Explorer, for example, produce 40 per cent higher yields than popular spring varieties do, but suffer from rough weather conditions. Establishing winter-hardy genes will enable canola to get a stronger foothold in its prime growing areas — in Western Canada, where it endures harsh winters, and in Europe, where broad fluctuations in temperature and stress cause problems.

Prof. Kott is assisted by graduate student Michelle Beath. This research is sponsored by the Ontario Ministry of Agriculture, Food and Rural Affairs, Agriculture and Agri-Food Canada through the CanAdapt Program (administered by the Agricultural Adaptation Council), the Natural Sciences and Engineering Research Council, the National Research Council through the Industrial Research Assistance Program, Food Systems 2000, Ontario Canola Growers and the Canola Council of Canada.

Soft white wheat

The wheat breeding program at the University of Guelph, led by Prof. Tony Hunt, Plant Agriculture, may have made its last soft white winter wheat cross. That's because Ontario is now endeavoring to produce its own hard red wheats for bread-making, and is also growing soft red winter wheat which has advantages over the soft white types. But the program recently released a solid soft white winter variety, OAC Ariss, and still has many soft white breeding lines in the pipeline. Released in 1995, OAC Ariss boasts good tolerance to most wheat diseases and has delivered stable yields across the various wheat-growing regions in Ontario.

Prof. Hunt's research is sponsored by the Ontario Ministry of Agriculture, Food and Rural Affairs and the Ontario Wheat Producers' Marketing Board.