



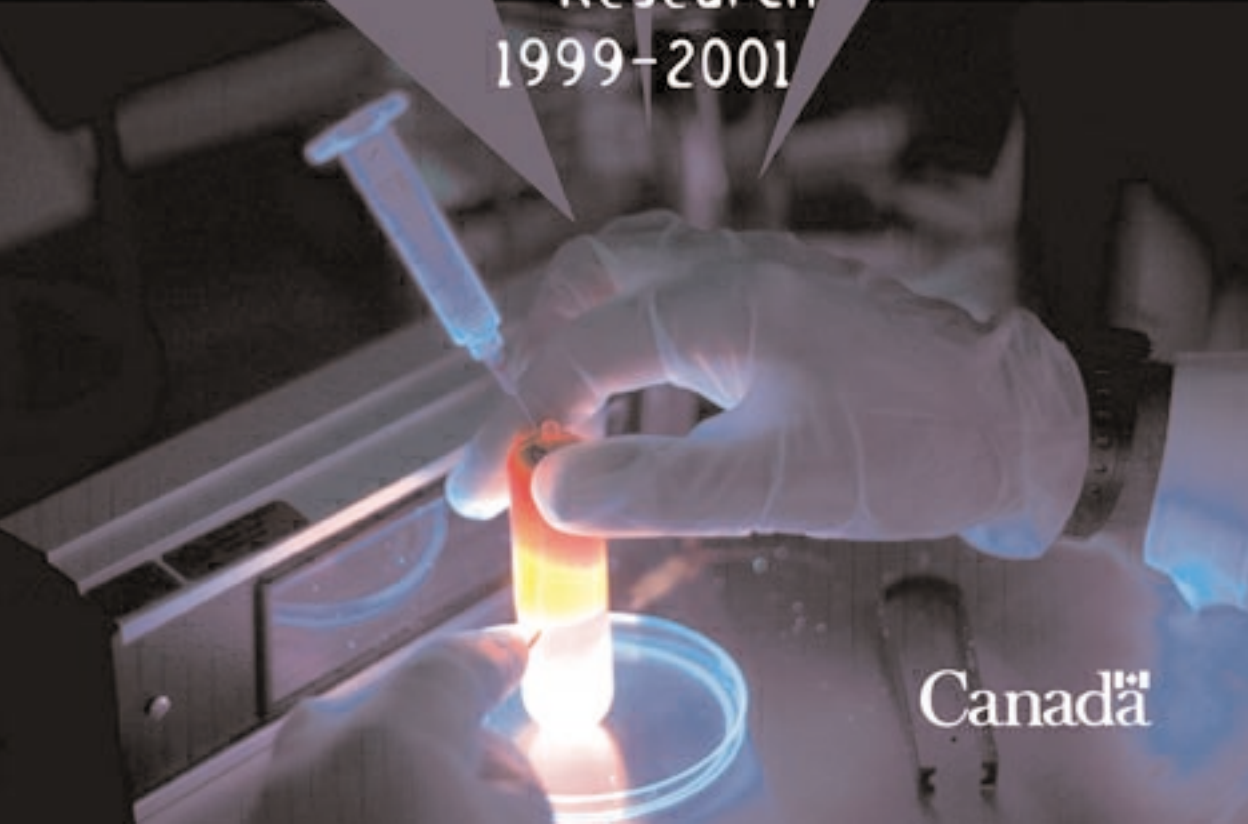
Agriculture and  
Agri-Food Canada

Agriculture et  
Agroalimentaire Canada

A graphic consisting of several grey, triangular shapes that resemble beams of light or spotlights, pointing downwards towards the text.

# Spotlight on Research 1999-2001

Companion  
to the annual  
Directory of  
Research  
1999-2001

A photograph of a laboratory setting. A person wearing white gloves is using a pipette to transfer liquid into a test tube. The test tube contains a yellow liquid. The scene is lit with a blue light, and a petri dish is visible in the foreground.

Canada

**See the complete  
*Directory of Research*  
1999–2001**

**Online at**

**[www.agr.gc.ca/science/research-recherche/ann-dir/index.html](http://www.agr.gc.ca/science/research-recherche/ann-dir/index.html)**

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# The Life Sciences Revolution

The new millennium has finally arrived. And along with this calendric event is the germ of a revolution that, when full-grown, will stand shoulder to shoulder with the colossal upheavals that have shaped our world — the agrarian revolution, the industrial revolution, the high-tech revolution.

We are on the threshold of the life sciences revolution. As we begin to unravel the mysteries of life itself, we will increase our knowledge and understanding of the world around us and within us. And that will lead to a better quality of life for all of us.


This meshes well with the goal of Agriculture and Agri-Food Canada, whose *raison d'être* is to improve the quality of life for all Canadians. And achieving this objective relies heavily upon research.

Of course it is the agri-food sector that ultimately delivers on this goal, with the department providing direction and support. Broadly speaking, this guidance is offered in three areas, based on what Canadians expect from their food supply system.

First of these is the security of the food system. This encompasses the concepts of risk management, a secure marketplace, and consumer confidence. It's pretty clear that research plays a role in all these issues.

Likewise for the second area, the health of our environment. In the categories of environmental awareness and environmental stewardship, research is a critical force.

Finally, the area of innovation for growth simply does not happen without R&D. Whether it's innovation and discovery, skills and investment, or market diversification, research is the engine that drives the show. These key results are the spine of AAFC's life science agenda.



*Spotlight on Research* is a companion piece, an appetizer, if you will, to the more extensive *Directory of Research 1999–2001*, found on the web at [www.agr.gc.ca/science/](http://www.agr.gc.ca/science/). The annual directories for the past two years are combined here in the current edition. Included in the web-based product is access to two new databases, providing you with easy-to-find information on AAFC's staff, organization, and research publications.

The aim of research at AAFC is to support the efforts of Canada's agri-food sector to develop and produce competitive products in an environmentally sustainable manner.

The directory contains just some of the recent achievements from our research networks across Canada that advance the life sciences agenda at AAFC. Each of our 19 research centres has a specialized national focus, providing one-stop shopping for key areas of agri-food research.

Commodities that cover a broad spectrum of ecozones are served by our comprehensive networks, within which partnered centres each place emphasis on the particular strengths of the local agricultural and agri-food sector. Our interconnected approach allows AAFC to deal with research challenges at many levels, from managing our resources, to breeding new crop varieties, to protecting crops against pests, and to developing new and innovative Canadian food products like nutraceuticals and functional foods for domestic and international markets.

Our family of research centres gets a further boost from the Matching Investment Initiative (MII). The MII allows the department to match, one-for-one, private sector investment in collaborative research in our labs. It also allows us to set our research priorities in tune with market signals.

For us to be successful, we must communicate effectively with our clients and research partners in industry, universities, and governments. AAFC's *Directory of Research 1999–2001* is one important way we help foster this communication. It is intended to help our clients and partners get in touch with us to access information and explore collaborative opportunities.

We hope that producers, businesses, researchers, students, and government officials, nationally and internationally, will take advantage of this directory to guide them in their search for information and contacts concerning our programs, our centres, and our people. We invite you to get in touch with us.

Gordon Dorrell  
A/Assistant Deputy Minister, Research

# AAFC's Research at a Glance



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## Research Resources, 2000-2001

Number of research centres across Canada	19
Number of employees*	2408
Number of professionals, including scientists*	712
Number of research projects	1270
Number of projects supported by the Matching Investment Initiative	930
Total budget	\$263,895,695
Percentage of budget	
For resource research	26%
For plant research	47%
For animal research	10%
For food and value-added research	17%
Matching Investment Initiative funding	\$32,000,000
Total land base of all research centres in hectares	29,900

\*Full-time equivalents



# How We Connect

AAFC's interconnected know-how at 19 centres offers our partners an entrepreneurial and highly skilled workforce toward maintaining an effective agri-food sector. Here's how we're linked.

## Soils Research

- Soils and Crops Research and Development Centre (Sainte-Foy)
- Brandon Research Centre
- Semiarid Prairie Agricultural Research Centre (Swift Current)
- Lethbridge Research Centre
- Crops and Livestock Research Centre (Charlottetown)
- Saskatoon Research Centre
- Potato Research Centre (Fredericton)
- Lacombe Research Centre
- Eastern Cereal and Oilseed Research Centre (Ottawa)
- Pacific Agri-Food Research Centre (Summerland)
- Southern Crop Protection and Food Research Centre (London)
- Greenhouse and Processing Crops Research Centre (Harrow)

## Genetic Resources, Pests, and Biocontrol Research

- Saskatoon Research Centre
- Greenhouse and Processing Crops Research Centre (Harrow)
- Cereal Research Centre (Winnipeg)
- Potato Research Centre (Fredericton)
- Eastern Cereal and Oilseed Research Centre (Ottawa)
- Lethbridge Research Centre

## Cereals Research

- Cereal Research Centre (Winnipeg)
- Eastern Cereal and Oilseed Research Centre (Ottawa)
- Brandon Research Centre
- Crops and Livestock Research Centre (Charlottetown)
- Semiarid Prairie Agricultural Research Centre (Swift Current)
- Lethbridge Research Centre
- Lacombe Research Centre

## Oilseeds Research

- Saskatoon Research Centre
- Eastern Cereal and Oilseed Research Centre (Ottawa)
- Cereal Research Centre (Winnipeg)
- Greenhouse and Processing Crops Research Centre (Harrow)
- Lacombe Research Centre



## **Forages Research**

- Lethbridge Research Centre
- Soils and Crops Research and Development Centre (Sainte-Foy)
- Semiarid Prairie Agricultural Research Centre (Swift Current)
- Atlantic Cool Climate Crop Research Centre (St. John's)
- Saskatoon Research Centre
- Crops and Livestock Research Centre (Charlottetown)
- Lacombe Research Centre
- Pacific Agri-Food Research Centre (Summerland)

## **Horticulture Research**

### **Field crops, vegetables, tree fruits and berries, and ornamentals**

- Horticulture Research and Development Centre (Saint-Jean-sur-Richelieu)
- Pacific Agri-Food Research Centre (Summerland/Agassiz)
- Atlantic Cool Climate Crop Research Centre (St. John's)
- Crops and Livestock Research Centre (Charlottetown)
- Atlantic Food and Horticulture Research Centre (Kentville)
- Potato Research Centre (Fredericton)
- Southern Crop Protection and Food Research Centre (London)
- Greenhouse and Processing Crops Research Centre (Harrow)
- Semiarid Prairie Agricultural Research Centre (Swift Current)
- Lethbridge Research Centre
- Cereal Research Centre (Winnipeg)

## **Animal Research**

### **Beef and dairy cattle, swine, and other animals**

- Dairy and Swine Research and Development Centre (Lennoxville)
- Lethbridge Research Centre
- Crops and Livestock Research Centre (Charlottetown)
- Brandon Research Centre
- Lacombe Research Centre
- Pacific Agri-Food Research Centre (Summerland)

## **Food Research (Meat, Dairy, and Value-Added Products)**

### **Animal, crop, and nonfood products and processes**

- Food Research and Development Centre (Saint-Hyacinthe)
- Lacombe Research Centre
- Food Research Program (Guelph)
- Pacific Agri-Food Research Centre (Summerland)
- Atlantic Food and Horticulture Research Centre (Kentville)
- Saskatoon Research Centre
- Eastern Cereal and Oilseed Research Centre (Ottawa)
- Southern Crop Protection and Food Research Centre (London)



## Soils

The health of the agri-food industry depends on both the quantity and the health of the soil. AAFC's research networks are focusing their efforts across Canada to protect our soils from degradation. The stories here show how our scientists are working to conserve this ubiquitous and precious natural resource. This work in the area of environmental stewardship is vital in ensuring the competitiveness of our agri-food industry in the years ahead.

### Industrial residues improve soils

Industrial waste products have potential as soil amendments, according to research at the Soils and Crops Research and Development Centre in Sainte-Foy, Quebec. Scientists studied a variety of products to determine their impact on soil magnesium, a trace element essential to plant growth.

Included in the study were foundry wastes and by-products from de-inking recycled paper. Among the crops studied were corn and blueberry. The studies will continue to examine the long-term effects of these treatments.

**Contact:** Dr. Gilles Rousselle, Director,  
(418) 657-7980

**Program:** Soils

**Key Result:** Environmental Stewardship

**Supporting Result:** Risk Management

### Composting cattle manure makes economic sense

Feedlot operators can compost their manure to make trucking it more affordable, according to a study at the Lethbridge Research Centre in Alberta. Researchers found that dry matter mass reductions came in at 20–30%, and bulk density of the manure increased by three to four times.

This allows up to 75% more manure, weight-for-weight, to be carried on a truck than uncomposted material. The compost can be economically trucked up to 35 km from the feedlot, compared with fresh manure, which has to be spread closer to source.

**Contact:** Dr. Steve Morgan Jones,  
Director, (403) 327-4561

**Program:** Soils

**Key Result:** Environmental Stewardship

**Supporting Result:** Risk Management



## Terracing potato fields saves soil

Potato production is essential to Atlantic Canada's economy, but it can also be responsible for serious erosion. Scientists at the Potato Research Centre in Fredericton, New Brunswick, have come up with a technology to reduce erosion on sloped fields.

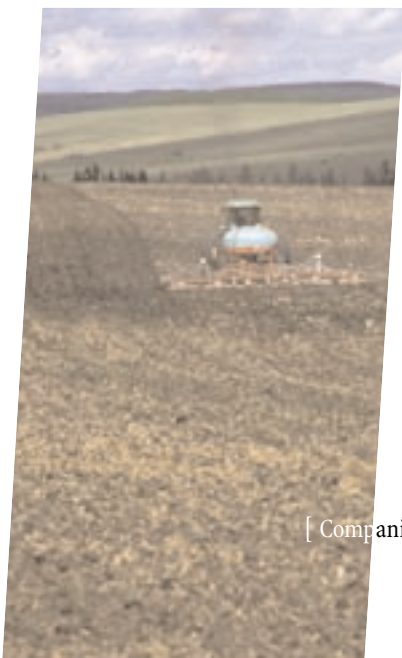
By breaking sloping fields up into terraces and grassed waterways, researchers were able to make dramatic gains in surface soil retention, from an average of 20 tonnes per hectare, to less than one tonne per hectare. Runoff was reduced by as much as 25% of the total growing season rainfall, making it more available to the crop.

**Contact:** Dr. Richard Butts, Director,  
(506) 452-3260

**Program:** Soils

**Key Result:** Environmental Stewardship

**Supporting Result:** Risk Management



## Organic wastes boost soil quality and vegetable production

The irrigated soils used for horticultural production in the southern interior of British Columbia can benefit from locally available wastes used as soil amendments, say researchers at the Pacific Agri-Food Research Centre. Those soils are typically coarse-textured and have low organic content and water-holding capacity.



A three-year study using biosolids and biowastes from urban and rural sources showed yield increases for Swiss chard and carrots. Moreover, the soil showed increased organic matter, decreased soil bulk density, and increased water retention.

**Contact:** Dr. Gordon Neish, Director,  
(250) 494-7711

**Program:** Soils

**Key Result:** Environmental Stewardship

**Supporting Result:** Innovation and  
Discovery



# Genetic Resources, Pests, and Biocontrol

As building blocks of all life, genetic resources are key to developing new crop varieties. AAFC's researchers are committed to preserving these valuable resources for future generations. To manage pests and achieve biocontrol in Canada's agri-food sector, scientists explore a mix of strategies that eliminates dependence on any one approach. Here are some ways scientists are working to conserve Canada's natural resources through environmental stewardship.

## Clover ecovar released for reclamation planting

An ecovar is a collection of diverse materials of a species. When seeded, the most adapted version takes over. The Plant Gene Resources of Canada, located at the Saskatoon Research Centre in Saskatchewan, has released seed of an ecovar of purple prairie clover to Ducks Unlimited. This is the first legume ecovar to be developed, and will be combined with native grasses to increase plant biodiversity.

Ducks Unlimited will make seed available for conservation planting by 2001. The clover also has niche market potential in the horticulture industry because of its showy long-lasting flowers and its persistence.

**Contact:** Dr. Ashley O'Sullivan, Director, (306) 956-7200

**Program:** Genetic Resources

**Key Result:** Environmental Stewardship

**Supporting Result:** Innovation and Discovery

## Insect takes on Dalmatian toadflax

The next successful biocontrol insect release appears to be on the horizon following a four-year study by scientists at the Lethbridge Research Centre in Alberta. *Mecinus janthinus* was released for control of Dalmatian toadflax at 50 sites.

The insect has established in all 50 sites, and has resulted in the elimination of flowering and stunting of 50% of the plants around release sites. In one site, the toadflax disappeared completely.

**Contact:** Dr. Steve Morgan Jones, Director, (403) 327-4561

**Program:** Pests and Biocontrol

**Key Result:** Environmental Stewardship

**Supporting Result:** Risk Management







## Biodiversity information at your fingertips

Researchers at the Eastern Cereal and Oilseed Research Centre have developed a way for Canadians to tap into the Integrated Taxonomic Information System (ITIS). It will let them search the Internet for information relevant to agriculture, biodiversity, biocomplexity, biocontrol, molecular genetics, international trade and more.

Queries in both official languages can search for biological information associated with scientific names, common names and synonyms. This capability is just the beginning of the Canadian version of the ITIS data retrieval program; the next step is to see whether an on-line edit model is feasible.

**Contact:** Dr. Jean-Marc Deschênes,  
Director, (613) 759-1816

**Program:** Genetic Resources

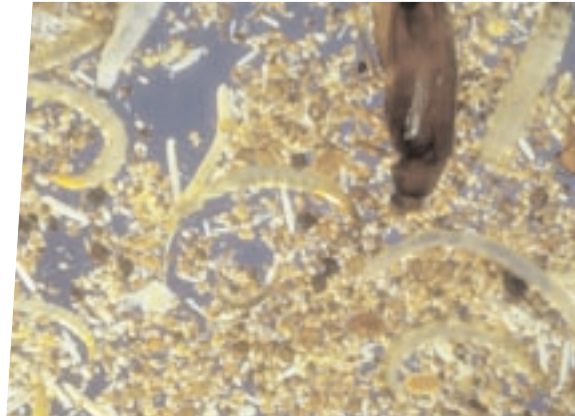
**Key Result:** Environmental Stewardship

**Supporting Result:** Environmental  
Awareness



## Marker spots resistance to soybean cyst nematode

Soybean cyst nematode is a growing concern for soybean growers in southern Ontario. To help breeders select for resistant varieties, scientists at the Greenhouse and Processing Crops Research Centre in Harrow, Ontario, have developed a molecular marker to help identify resistant lines.



The marker effectively identifies resistant lines in a segregating population with over 90% accuracy, according to field trials. The marker will greatly increase field and greenhouse evaluation of resistance to soybean cyst nematode in the centre's breeding program.

**Contact:** Dr. Gary Whitfield, Director,  
(519) 738-2251

**Program:** Genetic Resources

**Key Result:** Environmental Stewardship

**Supporting Result:** Innovation and  
Discovery



# Cereals

Amber waves of grain form one of the most enduring images of agriculture, and cereal research is an equally enduring business for AAFC's scientists. Cereal research includes wheat, oats, barley, and corn. The stories below show some ways in which scientists are breeding new varieties with improved characteristics—like better resistance to disease, cold, and limited water. Cereal researchers also direct their attention to developing sustainable production systems. AAFC's cereal research programs demonstrate the kind of innovation for growth that is enhancing the quality of life for all Canadians.

## Doubled haploid technology pays off

Getting new wheat varieties to market is a time-consuming task, typically taking up to eight years from the initial cross to registration. Scientists at the Cereal Research Centre in Winnipeg have managed to shave off almost a third of that time.

They've just registered three superior wheat varieties after only five and a half years after the initial cross. They owe their success in part to doubled haploid breeding technology and to marker-assisted selection.

**Contact:** Dr. Jim Bole, Director,  
(204) 983-5533

**Subject:** Cereals

**Key Result:** Innovation and Discovery

**Supporting Result:** Market  
Diversification

## New crop varieties address niche market opportunities

Researchers from the Eastern Cereal and Oilseed Research Centre in Ottawa have developed two new winter wheat varieties for bread. The new varieties are specifically designed for conditions in eastern Canada.

The bread winter wheats, AC Delta and AC Zorro, incorporate winter hardiness and high grain protein content. Researchers have also found the genetic variability for *Fusarium* resistance and have incorporated it into advanced breeding lines.

**Contact:** Dr. Jean-Marc Deschênes,  
Director, (613) 759-1816

**Subject:** Cereals

**Key Result:** Innovation and Discovery

**Supporting Result:** Market  
Diversification



## Malting barley a big hit with brewers

AC Metcalfe, a two-row malting barley from the Brandon Research Centre in Manitoba, is garnering attention from the malting and brewing industry. The beer people are interested in AC Metcalfe as a possible replacement for Harrington.



The Big Rock Brewery of Calgary recently launched a new beer called Kold, made of glacier water and AC Metcalfe malt. Big Rock is Canada's second-largest craft brewery.

**Contact:** Dr. Reg Kucey, Director,  
(204) 726-7650

**Program:** Cereals

**Key Result:** Innovation and Discovery

**Supporting Result:** Market  
Diversification

## Noodle wheat has resistance to loose smut

A Canada prairie spring white wheat variety from the Semiarid Prairie Agricultural Research Centre in Swift Current, Saskatchewan, shows excellent potential for the Asian noodle market. It is currently undergoing market evaluation, following interim registration.

The variety has the potential to open new markets for Canadian wheat in Asia. The Canadian Wheat Board has asked for and is helping finance seed multiplication in New Zealand to speed up market testing. The new wheat was developed in collaboration with SeCan, Alberta Agriculture, and the Western Grains Research Foundation.

**Contact:** Dr. Wayne Lindwall, Director,  
(306) 778-7200

**Program:** Cereals

**Key Result:** Innovation and Discovery

**Supporting Result:** Market  
Diversification





# Oilseeds

Oilseeds have been big business at AAFC even before canola came out of our labs to provide Canadians with a reliable source of healthy vegetable oil. In addition to canola, the oilseed research network also includes soy development and flax breeding. The stories below provide examples of the innovative, value-added products AAFC's researchers are discovering to boost the Canadian economy.

## Molecular marker technology helps canola breeders

Researchers at the Saskatoon Research Centre in Saskatchewan have come up with molecular markers that will allow canola breeders to select for a number of important traits. The markers segregate desirable plants from crosses of *Brassica napus* parents.

Among the traits that the markers will help select for are blackleg resistance, seed colour and linolenic acid content. Markers are reliable indicators because they are not affected by environmental conditions.

**Contact:** Dr. Ashley O'Sullivan Director,  
(306) 956-7200

**Program:** Oilseeds

**Key Result:** Innovation and Discovery

**Supporting Result:** Market  
Diversification

## Americans approve new type of canola

A new source of canola, *Brassica juncea*, developed by the Saskatoon Research Centre and the Saskatchewan Wheat Pool, has received the Generally Regarded as Safe designation from regulators in the United States. This will help boost the fortunes of *B. juncea*, which has the potential to dramatically increase canola production in the Brown soil zone of the dry prairie.

There are still some domestic regulatory aspects that need to be addressed. Health Canada and the Canadian Food Inspection Agency have yet to give regulatory approval, and changes to labelling laws will need to be enacted.

**Contact:** Dr. Ashley O'Sullivan Director,  
(306) 956-7200

**Program:** Oilseeds

**Key Result:** Innovation and Discovery

**Supporting Result:** Market  
Diversification

## Miso makes believers of Japanese customers

Canada's food-grade soybean industry got a boost from a respectable showing of Canadian products at Japanese miso competitions. Just securing an invitation to such an event is considered to be somewhat of a coup.



Miso is a paste used in preparing soups and other foods in Japanese cooking, made by fermenting cooked soybean with rice and salt. The product from the Greenhouse and Processing Crops Research Centre in Harrow, Ontario, garnered national and international media attention, awards and appreciation for the work done by the centre and Canada's trade mission.

**Contact:** Dr. Gary Whitfield, Director,  
(519) 738-2251

**Program:** Oilseeds

**Key Result:** Market Diversification

**Supporting Result:** Skills and  
Investment







# Forages

Forage research at AAFC is breaking new ground. Forages are among the most widely grown crops in Canada, but the stories below show that there is nothing ordinary about the forage research in AAFC's labs.

## Barley makes inroads in Newfoundland

Studies at the Atlantic Cool Climate Crop Research Centre have led to increases in small-grain production in Newfoundland. After six years of on-farm adaptive research, scientists have demonstrated the potential of barley for local dairy farmers.

Planting as early as possible results in the highest yields, but poses climate-related risks. Scientists were also able to show how lime applications affect yields. Based on this work, some local farmers are now committing relatively large areas of land to barley and winter wheat production.

**Contact:** Dr. John Richards, Director,  
(709) 772-7474

**Program:** Forages

**Key Result:** Market Diversification

**Supporting Result:** Skills and Investment

## Hybrid grass has dual purpose

Researchers at the Saskatoon Research Centre in Saskatchewan have released a new hybrid brome-grass variety, the first from the centre. The hybrid has intermediate characteristics to its parental species.

The grass yields similarly to smooth brome-grass for the first cut hay yields and then regrows well, like meadow brome, for grazing for the rest of the season. There has been considerable interest from industry for the marketing rights to this dual-purpose hay-pasture variety.

**Contact:** Dr. Ashley O'Sullivan Director,  
(306) 956-7200

**Program:** Forages

**Key Result:** Innovation and Discovery

**Supporting Result:** Market Diversification



## Looking for homegrown solutions

Diversification is a catchword that has a lot of currency these days, and scientists at the Crops and Livestock Research Centre in Charlottetown are doing what they can to help people cash in. Researchers are focusing on nontraditional crops and nontraditional uses of traditional crops such as forage and canola seed production, and high-moisture grain.



The studies are aimed at finding financial incentives to adhere to good cropping practices such as adequate crop rotation. Scientists are considering the potential of alternative crops for industrial or other value-added applications.

**Contact:** Dr. Christiane Deslauriers,  
Director, (902) 566-6800

**Subject:** Cereals, Forages, Oilseeds

**Key Result:** Innovation and Discovery

**Supporting Result:** Market  
Diversification

## Alfalfa is prepared to stick around

A new variety of alfalfa from the Lethbridge Research Centre in Alberta will be around for a while longer than most. AC Longview, true to its name, will persist for five to six years, compared with the average of three to four years for regular alfalfa.

The recently registered variety also maintains its quality throughout its life cycle. It has a very high level of resistance to verticillium and bacterial wilt diseases.

**Contact:** Dr. Steve Morgan Jones,  
Director, (403) 327-4561

**Program:** Forages

**Key Result:** Innovation and Discovery

**Supporting Result:** Market  
Diversification





## Horticulture

Horticulture is practised in every province of Canada. Scientists focus on developing environmentally sustainable methods of production, adaptation, and protection for field crops, vegetables, tree fruits, berries, and ornamentals. Potatoes are a staple traditionally important to the economy in the Atlantic provinces and now, also, in the prairies. Fresh fruit and vegetables are increasingly recognized as essential for optimum health. Here are some innovative ways AAFC is helping secure the supply of these foods and support producers.

### New potato is pure gold

A new potato developed at the Lethbridge Research Centre in Alberta is the first Canadian-bred yellow-fleshed french fry variety. AC Maple Gold is also suitable for the fresh market.



The potato can be harvested early—80 days after planting—and can be stored successfully for long periods. It has marketable yields similar to Russet Burbank, but with smaller tubers. It is resistant to fusarium wilt and moderately resistant to early blight.

**Contact:** Dr. Steve Morgan Jones,  
Director, (403) 327-4561

**Program:** Horticulture (Field crops)

**Key Result:** Innovation and Discovery

**Supporting Result:** Market  
Diversification

### Taming the wild orchid

Wild orchids are a much sought-after flower, which tends to have a negative impact on their natural habitat. Scientists at the Horticulture Research and Development Centre in Saint-Jean-sur-Richelieu, Quebec, have found a way to take the pressure off the orchid's native habitat.

Researchers have come up with a new *in vitro* technology to produce the orchid on a commercial scale. The technology offers a new product to industry as well as protecting habitats from damage.

**Contact:** Dr. Denis Demars, Director,  
(450) 346-4494

**Subject:** Horticulture (Ornamentals)

**Key Result:** Innovation and Discovery

**Supporting Result:** Environmental  
Stewardship





## Eat it, it's good for you

Consumers are showing a growing interest in the nutritive benefits of foods, and studies at the Atlantic Food and Horticulture Research Centre in Kentville, Nova Scotia, are aimed at providing the facts. Scientists are looking at the antioxidant capacity of fresh and stored small fruits. Antioxidants include vitamin C, phenolics and anthocyanins.

Collaborative studies centre on the antioxidant content and the role of oxidative stress of the plant or fruit, and their relationship to human health. The centre's work in this area is opening new collaboration opportunities with health researchers.

**Contact:** Dr. Wade Johnson, Director,  
(902) 679-5333

**Program:** Horticulture (Tree fruits and berries)

**Key Result:** Innovation and Discovery

**Supporting Result:** Consumer Confidence



## Sea buckthorn shows promise as alternative crop

Sea buckthorn is a promising alternative crop with potential for value-added products in the nutraceutical, cosmetic and pharmaceutical industries. Scientists at the Pacific Agri-Food Research Centre in Summerland, British Columbia, have been working on a number of projects to help growers get in on the ground floor of this new opportunity.

Researchers have published a grower's guide for sea buckthorn, and over 150 copies have been distributed. They've also developed a mechanical harvester that has tested very well. There are about 182 hectares planted across Canada, and plants for future plantations are in great demand.

**Contact:** Dr. Gordon Neish, Director,  
(250) 494-7711

**Program:** Horticulture (Field crops)

**Key Result:** Innovation and Discovery

**Supporting Result:** Market Diversification





## Cattle, Swine, and Other Animals

Livestock is a multi-million dollar industry in Canada, and it's a key business in our labs, too. Studies include livestock nutrition, genetics, pest management, manure management, animal production systems, and animal behaviour. The stories below indicate some of the innovations our scientists are making so Canadians can be sure animals are raised humanely in ways that conserve our environment, contribute to a safe food supply, and help provide a sound return on investment for Canada's producers.

### Hog diets reduce manure production

Modifying the feed rations of swine can make a positive impact on manure management strategies, according to researchers at the Brandon Research Centre in Manitoba. For instance, hullless barley diets can reduce fecal dry matter by about 25–30%, thereby reducing the overall volume of manure.

Other strategies include replacing soybean meal with supplemental amino acids to reduce the excretion of nitrogen by about 28% in swine manure. These feeding strategies provide options to swine producers for their manure nutrient management plans.

**Contact:** Dr. Reg Kucey, Director,  
(204) 726-7650

**Program:** Animals (Swine)

**Key Result:** Innovation and Discovery

**Supporting Result:** Environmental Stewardship

### Software predicts beef marbling and yield

Software from the Lacombe Research Centre in Alberta has attracted attention from commercial interests in Canada and Europe. The software is for a real-time ultrasound system to predict yield and marbling in beef cattle.

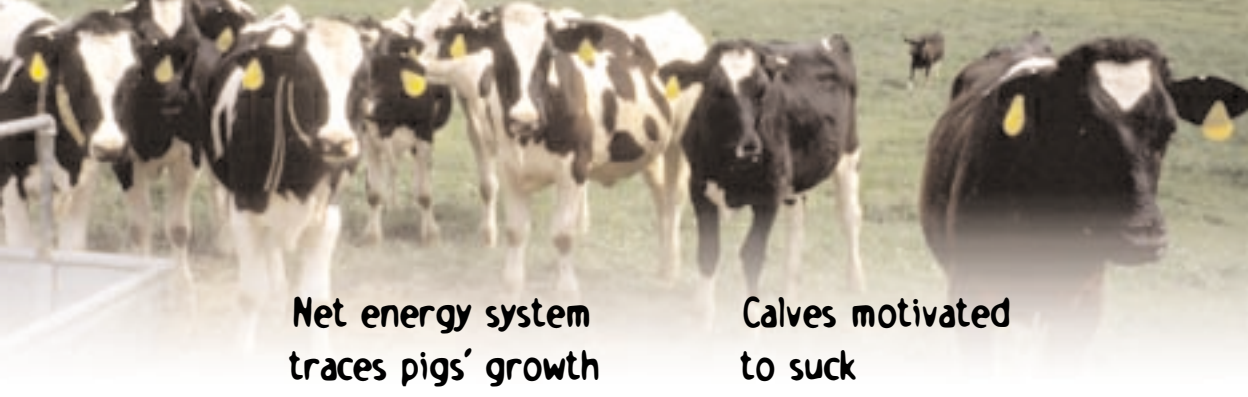
Economic benefits include a tool to help improve beef production systems and performance testing with payback to producers. The software still needs more data from commercial trials to perfect the prediction routine.

**Contact:** Dr. David Bailey, Director,  
(403) 782-8100

**Program:** Animals (Beef cattle)

**Key Result:** Innovation and Discovery

**Supporting Result:** Skills and Investment



## Net energy system traces pigs' growth

Feed formulators can now prepare rations better suited to swine growth, while reducing nitrogen excreted to the environment, thanks to work at the Dairy and Swine Research and Development Centre in Lennoxville, Quebec. Scientists have developed a net energy system that takes into account the digestible energy efficiency between nutrients.



Incorporated into a mathematical model, the system can predict how the protein and fat deposits of growing pigs can be affected by changes in nutrient composition of the rations, feeding levels, the pigs' growth stage, and their genetic potential for protein growth.

**Contact:** Dr. Jacques Surprenant,  
Director, (819) 565-9174  
**Subject:** Animals (Swine)  
**Key Result:** Innovation and Discovery  
**Supporting Result:** Environmental Stewardship

## Calves motivated to suck

Calves just love to suck, especially after a milk meal. The reflex is probably triggered by the taste of milk, but it can lead to bad habits, such as sucking on pen bars or even other calves.

Scientists at the Dairy and Swine Research and Development Centre in Lennoxville, Quebec, have found that providing the calf with a dry teat after a milk feeding decreases the development of those bad habits. Sucking is important to calves, as it seems to stimulate digestive hormones.

**Contact:** Dr. Jacques Surprenant,  
Director, (819) 565-9174  
**Subject:** Animals (Cattle)  
**Key Result:** Innovation and Discovery  
**Supporting Result:** Consumer Confidence







## Meat, Dairy, and Value-Added Products

AAFC's food research program includes developing and adopting new and nontraditional Canadian products and processes for meat, dairy, and value-added products. It focuses on animal, crop, and nonfood products and processes. Unique foods and food components, like lycopene in tomatoes, impart specific health benefits to Canadians. These nutraceuticals and functional foods are becoming increasingly important to the agri-food sector. The stories below show how agri-food research is helping Canada capture a share of diversified markets around the world. This activity creates economic growth and promotes Canada as a world leader in food safety and quality.

### Tomato skins yield lycopene extract

Scientists at the Food Research Program in Guelph, Ontario, have come up with a new technology to extract lycopene from tomato skins without using organic solvents. The extract is bio-active and stable, and it can be manufactured in commercially useable capsule form.

Lycopene is a compound with enormous potential in the nutraceutical market. The centre has applied for a patent, and is looking for partners to scale up the pilot process to full commercial production levels. The work is expected to help develop a Canadian lycopene supply industry.

**Contact:** Greg Poushinsky, Director,  
(519) 829-2400

**Subject:** Value-Added Products  
**Key Result:** Innovation and Discovery  
**Supporting Result:** Market  
Diversification

### Technology uses everything but the cluck


Adding value to chicken by-products was the goal of a Matching Investment Initiative project between the Food Research and Development Centre in Saint-Hyacinthe, Quebec, and a private sector company. The study saw chicken fat and gelatin put to use in the food industry.

The technology is now in use commercially, and the centre is discussing the possibility of continuing the project to increase the value of various by-products.

**Contact:** Dr. Angèle St-Yves, Director,  
(450) 773-1105

**Subject:** Meat  
**Key Result:** Market Diversification  
**Supporting Result:** Innovation and  
Discovery





## Pasteurization improves safety of ground beef

Researchers at the Lacombe Research Centre in Alberta have developed a hot-water pasteurization treatment to improve the safety of ground beef and hamburger patties. The microbiological efficacy of the treatment has been verified, which means that pathogens such as *E. coli* 0157:H7 can be eliminated.



The centre is working with Caravelle Foods in a final trial before commercialization. The technology will help Canadian ground beef exporters to the United States, which has a zero-tolerance policy for *E. coli* 0157:H7.

**Contact:** Dr. David Bailey, Director,  
(403) 782-8100

**Program:** Meat

**Key Result:** Market Diversification

**Supporting Result:** Consumer Confidence

## Molecular farming reaps healthful compounds

Molecular farming is a way to produce high-value proteins in plants at very low cost and in large amounts. Researchers at the Southern Crop Protection and Food Research Centre in London, Ontario, are working on a number of molecular farming projects aimed at benefitting human health.

Working with labs in Europe and the United States, scientists are studying molecular farming applications in human blood products and diagnostic antibodies. They're also developing systems to produce B vitamins in plants.

**Contact:** Dr. Gilles Saindon, Director,  
(519) 457-1470

**Subject:** Value-Added Products

**Key Result:** Market Diversification

**Supporting Result:** Innovation and Discovery



## A Final Word

*Spotlight on Research* contains just a sampling of the research achievements from 1999-2001. A much more comprehensive report can be found on our web site at [www.agr.gc.ca/science](http://www.agr.gc.ca/science). There, you can also find links to our centres to gain a fuller understanding of our research programs. For a quick overview of our research activities and their locations, consult the program grid on page 27. A complete list of centre directors and how to reach them is on page 28.



# Who does what

## Research Centres

### Programs

	Atlantic Cool Climate Crop Research Centre (St. John's)	Crops and Livestock Research Centre (Charlottetown)	Atlantic Food and Horticulture Research Centre (Kentville)	Potato Research Centre (Fredericton)	Soils and Crops Research and Development Centre (Sainte-Foy)	Dairy and Swine Research and Development Centre (Lennoxville)	Horticulture Research and Development Centre (Sylt-Jean-sur-Richelieu)	Food Research and Development Centre (Saint-Hyacinthe)	Eastern Cereal and Oilseed Research Centre (Ottawa)	Food Research Program (Guelph)	Southern Crop Protection and Food Research Centre (London)	Greenhouse and Processing Crops Research Centre (Harrow)	Cereal Research Centre (Winnipeg)	Brandon Research Centre	Saskatoon Research Centre	Semiarid Prairie Agricultural Research Centre (Swift Current)	Lethbridge Research Centre	Lacombe Research Centre	Pacific Agri-Food Research Centre (Summerland)
Soils, Water and Air		●		●	●				●		●	●		●	●	●	●	●	●
Genetic resources, pests & biocontrol				●					●			●	●		●		●		
Cereals		●							●			●	●	●		●	●	●	●
Oilseeds									●			●	●		●			●	
Forages	●	●		●											●	●	●	●	●
Field crops											●	●				●	●		
Vegetables	●	●	●	●			●			●	●						●		●
Tree fruits & berries	●		●				●			●									●
Ornamentals							●			●		●							
Beef Cattle		●				●								●			●		
Dairy Cattle						●													
Swine		●				●													
Poultry		●																	●
Other animals						●												●	
Animal products & processes							●		●									●	
Crop products & processes		●					●		●					●					●
Nonfood products & processes		●					●	●	●	●				●					

# Reaching AAFC's research centres

Find out more about us by visiting our homepage on the Internet at [www.agr.gc.ca/science...](http://www.agr.gc.ca/science...) or **contact us** directly at ....

## **Atlantic Cool Climate Crop Research Centre,**

### **St. John's, Newfoundland**

Dr. John Richards, Director  
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Facsimile (709) 772-3820  
Internet richardsj@em.agr.ca

## **Crops and Livestock Research Centre, Charlottetown, Prince Edward Island**

Dr. Christiane Deslauriers, Director  
Telephone (902) 566-6800  
Facsimile (902) 566-6821  
Internet deslauriersc@em.agr.ca

## **Atlantic Food and Horticulture Research Centre, Kentville, Nova Scotia**

Dr. Wade Johnson, Director  
Telephone (902) 679-5700  
Facsimile (902) 679-5784  
Internet johnsonw@em.agr.ca

## **Potato Research Centre, Fredericton, New Brunswick**

Dr. Richard Butts, Director  
Telephone (506) 452-3260  
Facsimile (506) 452-3316  
Internet standringb@em.agr.ca

## **Soils and Crops Research and Development Centre, Sainte-Foy, Quebec**

Dr. Gilles Rousselle, Director  
Telephone (418) 657-7980  
Facsimile (418) 648-2402  
Internet rousselleg@em.agr.ca

## **Dairy and Swine Research and Development Centre, Lennoxville, Quebec**

Dr. Jacques Surprenant, Director  
Telephone (819) 565-9174  
Facsimile (819) 564-5507  
Internet surprenantj@em.agr.ca

## **Horticulture Research and Development Centre, Saint-Jean-sur-Richelieu, Quebec**

Dr. Denis Demars, Director  
Telephone (450) 346-4494  
Facsimile (450) 346-7740  
Internet demarsd@em.agr.ca

## **Food Research and Development Centre, Saint-Hyacinthe, Quebec**

Mme Angèle St-Yves, Director  
Telephone (450) 773-1105  
Facsimile (450) 773-2888  
Internet styvesa@em.agr.ca

## **Eastern Cereal and Oilseed Research Centre, Ottawa, Ontario**

Dr. Jean-Marc Deschênes, Director  
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Facsimile (613) 759-1970  
Internet deschenesjm@em.agr.ca

## **Food Research Program, Guelph, Ontario**

Mr. Greg Poushinsky, Director  
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Facsimile (519) 829-2602  
Internet poushinskyg@em.agr.ca

## **Southern Crop Protection and Food Research Centre, London, Ontario**

Dr. Gilles Saindon, Director  
Telephone (519) 457-1470  
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## **Greenhouse and Processing Crops Research Centre, Harrow, Ontario**

Dr. Gary Whitfield, Director  
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## **Cereal Research Centre, Winnipeg, Manitoba**

Dr. Jim Bole, Director  
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Facsimile (204) 983-6333  
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## **Brandon Research Centre, Manitoba**

Dr. Reg Kucey, Director  
Telephone (204) 726-7650  
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## **Saskatoon Research Centre, Saskatchewan**

Dr. Ashley O'Sullivan, Director  
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## **Semi-arid Prairie Agricultural Research Centre, Swift Current, Saskatchewan**

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## **Lethbridge Research Centre, Alberta**

Dr. Steve D. Morgan Jones, Director  
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## **Lacombe Research Centre, Alberta**

Dr. David Bailey, Director  
Telephone (403) 782-8100  
Facsimile (403) 782-6120  
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## **Pacific Agri-Food Research Centre, Summerland, British Columbia**

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## **Also here to help answer your questions is...**

### **Research Planning and Coordination Directorate, Ottawa, Ontario**

Mr. Bruce Mitchell, Director General  
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