Agtech CENTRE Innovator

Volume 4 Issue 3 July 2004

Technology Drives a New Generation of Farming

Searching for practical solutions to keep farmers productive.

Farmers are facing major issues of sustainability. Economically – how to profit in an aggressive global environment. Environmentally – how to be productive in an era of increasingly stringent environmental standards. And socially – how to meet society's ever increasing standards for crop and livestock production.

While these are challenges, they are also major opportunities. Never before has technology been positioned to play such an integral role in farm profitability. Technology development is moving at breakneck speed, and producers are better educated and more able to incorporate this technology quickly.

If Canadian farmers are going to capture these opportunities, they need to operate at the leading edge in both the development and uptake of this technology. Alberta Agriculture, Food and Rural Development's (AAFRD) AgTech Centre believes this requires a systems approach to farming that brings crop and livestock production together in concert with broader issues – a holistic thinking that leads to a more profitable approach.

Today the AgTech team of engineers, technologists and support staff work with a broad network of industry partners and farmers to build solutions that work in the real world. The strongest focus is to benefit producers, the anchors of the food production chain.

Emerging Issues in Agriculture

AgTech Centre is involved in developing technology solutions for these production issues:

- Environmental impacts of agriculture operations.
- Stewardship of resources.
- Special crops and diversification.
- Further production efficiencies.
- New facilities, equipment, technology and their application to production systems.
- Alternative production practices.
- Alternative sources of energy.

In this Issue

- Technology Drives a New Generation of Farming
- The Keys to Capturing Innovation
- AgTech Centre Research Focuses on Four Core Areas

The keys to capturing innovation

Building a basis of creative solutions for the future.

What is the basis for true innovation? In the world of agricultural technology, it's a network and team approach to produce a business-focused strategy that leads to real results.

AgTech Centre has used this approach to establish itself as a key link between research and applied solutions in sustainable agricultural systems. "Our challenge is to make the latest and best technology available to producers," says Lawrence Papworth, manager and project engineer at AgTech Centre.

Build on history

AgTech Centre's respected track record, built over a 45-year history of Prairie-based testing and evaluation, plays a key role in technology development. Its broad-based applied research and technology development keeps pace with a rapidly changing agricultural industry.

"We provide ongoing testing and evaluation of equipment and production practices that directly benefit farmers," says Papworth. "Technology development is the key to sustainable agriculture and producer profitability."

The Lethbridge-based Centre was established in 1975 as one of three centres making up the Prairie Agricultural Machinery Research Institute (PAMI). It focused on evaluating tillage, seeding and spraying technology. Later, renamed as the Alberta Farm Machinery Research Centre, it became part of Alberta Agriculture's Agricultural Engineering Branch.

With an expanding mandate that included research and development, the Centre was established as AgTech Centre in 2001. It continues to have a complementary relationship with many research institutions.

Broad, sustainable focus

AgTech Centre's objective is to provide sustainable farming solutions to today's producers. Though the Centre maintains a strong focus on crop production technology, it also examines many of the fundamental issues affecting livestock production such as manure and nutrient management, composting technology, as well as air and water quality. Projects often cross over between these key sectors.

"Recognizing that many aspects of crop and livestock production complement each other, we take a holistic approach in our research," says Papworth. "We investigate technology that can be used or adapted by crop farmers and livestock producers to further their efforts toward sustainable production."

Strong partnerships

The multi-disciplinary approach of AgTech Centre's research and technology development is based on highly valued ongoing partnerships in the agricultural industry. There's a distinct producer flavour to that activity that keeps it focused on the technology of greatest value to farmers today.

Partners include producer groups, industry associations, other public research facilities such as Agriculture and Agri-Food Canada, universities and private companies. Through these connections, AgTech Centre leverages resources and develops processes needed to get technology into the field.

Partnership projects can range from helping individual farmers develop and evaluate their invention concepts, to testing high-end equipment for large manufacturers. Support ranges from monetary to intellectual or in-kind support in the form of tools or facilities.

"Partnerships allow us to expand our knowledge base beyond what we could do on our own. And more importantly, they allow us to get the information to producers faster," says Papworth.

Establish core strengths

With a strong emphasis on applied research – making sure technology and practices actually work in the field – the Centre has built expertise in three key areas.

Testing. AgTech Centre uses its expertise and sophisticated evaluation technology to test a wide range of existing and new equipment, products and farming practices. Testing is about measurement. AgTech Centre goes to great lengths to develop new and improved measurement techniques that are statistically sound.

Evaluation and analysis. As an objective partner with no vested interest other than making whatever is tested better, the Centre has the opportunity to make critical evaluations. With its team of experienced engineers and technologists, the Centre can pinpoint problems and provide manufacturers and/or producers with a clear analysis of the issues and the corrective measures needed.

Development. Often the Centre directly assists companies to develop specific technology to test equipment and/or its components.

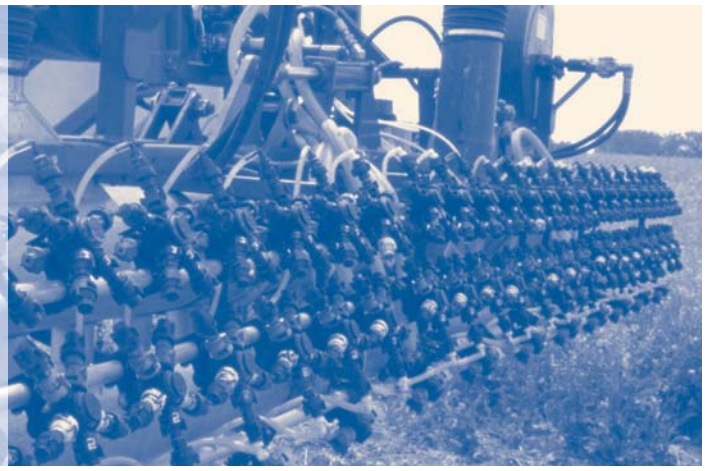
Bringing technology to producers

It's critical that new technology and information gets into the hands of producers, says Papworth. "The best technology and latest information has no value if no one knows about it, so making the results of AgTech's evaluations and analysis available to producers is a fundamental part of our business."

AgTech has a wide range of reports, newsletters and other communication tools available for producers and industry.

AgTech Centre research focuses on four core areas

Direct benefits to producers and industry.



The latest technology is the key to survival for today's farmers. The development and refining of equipment and technology is fundamental to maintaining a productive, sustainable and competitive agricultural industry.

The increasing cost of larger, more powerful machinery and equipment represents a huge percentage of farm operating and capital costs. Together, machinery and technology are figured as the number two capital investment for Alberta farmers, second only to land purchase.

"Machinery and technology are one of the few areas of a farm business that producers can control," says Papworth. "Our goal is to provide information that can help farmers make better management decisions on purchases or use of technology."

Four core areas form the basis of AgTech's research portfolio:

Sprayer technology. Testing spraying equipment has been a specialty of the Centre since it was established in 1975. Through ongoing tests, engineers evaluate several aspects and issues of field spraying, including nozzle choice, drift, coverage and droplet size. A particular emphasis is testing at field scale levels.

"Spraying has evolved over the last 20 years and we're constantly trying to improve the technology," says Papworth. "One of the most critical aspects of environmental impact is drift control. It's important that chemicals are applied effectively, without losses. This has been a large part of our past work, and because chemical application is an important factor in sustainable agriculture, it will continue to be a large part of the Centre's activities."

Direct seeding and fertilizer application. Ongoing research and field testing on direct seeding and fertilizer application help fine-tune crop production efficiency. "AgTech studies have shown that, in terms of fuel and labour costs, direct seeding can save farmers money," says Papworth. "Using the right equipment, under proper conditions can help reduce input costs and increase crop yields."

As well, new approaches to fertilizer placement being tested by Centre engineers and technicians also help producers get the biggest bang for their buck. "We're finding it may not be the type of fertilizer, but more the optimum placement or row spacing that will produce the greatest return," adds Papworth.

Manure management and handling has become a key part of the AgTech Centre program. Recognizing that manure is a valuable nutrient source, technology is being developed for practical storage or processing and application methods that are environmentally and socially sound. Key

Lawrence Papworth

project areas include technology for manure odour control and composting techniques, which convert an often-regarded "waste" into a value-added product and important soil amendment.

Traction and tractor efficiency. As one of the largest machinery costs on the farm, it's important that producers make the most efficient use of their tractor. Key considerations are properly matching tire size and air pressure, as well as tractor size and ballasting to the task at hand.

"These key considerations will help farmers achieve operating cost savings through improved fuel efficiency," says Papworth. "They will also help reduce wear and tear on equipment, and get the job done as efficiently as possible."

Testing equipment and technology development. AgTech's cornerstone services rely on its own innovation in developing specialized tools and procedures for accurate and unbiased testing of new and existing equipment. This expertise helps develop technologies that benefit manufacturers and ultimately producers. Finding more precise ways to evaluate and measure the performance of equipment and the value of technology has significant economic impact.

"AgTech Centre has had significant impact on technology development in the Prairies over the last 20 years," says Papworth. "The Centre has raised the bar on farming technology."

Specialized product development

One of the most powerful effects of AgTech's program is the ability to develop specialized equipment and technology in each of its core research areas.

Specialized tools and facilities include a well-equipped fabricating lab, field equipment and electronic measuring equipment. For example, a specialized electronic device can measure soil disturbance as the result of manure incorporation, as well as the effect of high and low disturbance seeding equipment. The Centre also developed one of the first plot-sized air seeders in North America that can handle all forms of fertilizer – dry, liquid and anhydrous.

Many companies come to the Centre with specific technology needs, Papworth explains. Some want an independent assessment of their equipment, whether it be a single component or the whole machine. Equipment may be tested in standard applications, or the manufacturer may need help solving problems with a prototype.

"Companies come to us looking for help in moving a concept through the idea stage to commercialization," says Papworth. "Part of our goal is to ensure that untested technology is effective and will benefit producers. Let's get the bugs out first so producers know what will work for them."

With recognized expertise in testing and evaluation services, AgTech Centre works directly with machinery and technology manufacturers, as well as individual inventors and innovators. "We have the skilled personnel, tools, equipment and know-how to provide a proper evaluation," says Papworth.

AgTech Centre's well-earned reputation is recognized by some of the largest manufacturers in the industry. Past projects have involved John Deere, Caterpillar, Ford/New Holland, Case IH, Bourgault, Flexi-Coil, Gen, Morris and several others.

"Both manufacturers and farmers know we deliver sound, unbiased information," says Papworth. "We tell it like it is, keeping the end-user in mind. Manufacturers realize if they want to be successful, their products have to really work in the field."

AgTech Centre

Branch Head: Rick Atkins
Manager and Engineer: Lawrence Papworth
Engineers and Project Managers: Katrina Lakenman, Blaine Metzger, Virginia Nelson, Darryl Slingerland, Brian Storozynsky, Reed Turner
Technologists: Ken Janzen, George Ragan, Dave Rea, Giang Truong, Jim Vanee
Support Staff: Debra Campbell, Vicie Walcott

Agtech CENTRE

AgTech Centre
Technical Services Division
3000 College Drive South
Lethbridge, Alberta, Canada T1K 1L6
Phone: (403) 329-1212
Fax: (403) 328-5562

AgTech Innovator

Alberta
AGRICULTURE, FOOD AND RURAL DEVELOPMENT