

2014 Canola Discovery Forum

TCU Place, Saskatoon

October 22-23



HIGHLIGHTS

The Canola Discovery Forum (CDF) is designed to discover research needs and industry opportunities to enhance profitable and sustainable canola production.

Dr. Curtis Rempel, Vice President of Crop Production and Innovation for the Canola Council of Canada, led off CDF 2014 with an outline of the CCC's strategic plan. To meet potential demand, Canada's canola industry will need 26 million metric tonnes of output and 52 bu./ac. average yield by 2025. Five pillars that will contribute to the 18 bu./ac. in average yield gains needed between now and 2025 are genetic improvement (8 bu./ac.), plant establishment (3 bu./ac.), fertilizer management (3 bu./ac.), integrated pest management (2 bu./ac.) and harvest management (2 bu./ac.).

Presentations and table discussion at CDF 2014 identified the following priorities for canola research and development:

1. Research needs to be presented in a way that clearly identifies how results contribute to best management practices and shows the return on investment for adopting a practice.
2. Sclerotinia stem rot is a major threat to yields some years, yet a return on investment for fungicides is not always achieved and growers often question the decision to spray. Is the decision-making checklist adequate? Or is the communication of proven recommendations failing? How do we help growers feel more confident in the decision to spray or not?
3. Identify the relationship between soil microbes and canola yield potential, with regard to germination, nutrient uptake and disease in particular. Effects are variable depending on environment, which makes it difficult to tell how products work and whether new biological crop nutrition products will pay off.
4. How to make our soils better. Reduction of tillage, rotation (including with cover crops), and proper fertilization results in increased availability of N, P, and K. Practices that improve soil quality also increase mineralization, which is a significant contributor of soil nitrogen. However, is there a return on investment with these practices? Does better soil pay, or can it be more easily and economically corrected with fertilizer?
5. Is the allocation of nitrogen for canola the best it can be? Hybrids have greater efficiency in use and extraction of nutrients. However, hybrids also leave less N in soil for crops following in rotation. Rates should be adjusted according to production potential. Tailor the application of N to the field management history.
6. There needs to be a better understanding of sulphur supply in the soil. Extractable sulphate is only part of the picture. Organic sulphur may be a major contributor to available sulphur, so how do we adjust rates accordingly?
7. The technology for variable-rate fertilizer is available, but predicting the response to fertilizer applications in each management zone is extremely difficult as there are so many factors at

play. Logistical challenges with regard to handling and varying fertilizer also remain. For these reasons, return on investment is not guaranteed for this practice. Is there still a case to be made for zone management of fertilizer?

8. There needs to be a better understanding of boron chemical formulation in Western Canadian soils, and under what circumstances boron is needed and will provide a return on investment.
9. Collecting, processing and sharing data will be key to agriculture advancement. Data can be used to compare one farm against other farms to know if the farm is staying ahead or falling behind. On-farm trials could be added to the data pool, but this will require coordination to ensure data quality.
10. Insect scouting recommendations could benefit from further refinement, especially when it comes to conditions that influence insect behaviour. For example, time of day and wind conditions may influence lygus counts in sweep nets.
11. Management practices for swede midge are needed, including an insecticide solution.
12. Genetics have been the best way to manage clubroot in fields with clubroot, but resistant varieties are being eroded in Quebec, and a pathotype has been identified in Alberta fields that can overcome the R gene. The challenges are to encourage prevention to keep clubroot out of non-infected areas, and to promote methods to protect R traits.
13. Herbicide resistant weeds are a looming threat. Diverse crop rotations will reduce the herbicide resistance risk. Genetics could be used to identify genes involved in metabolism, and RNA interference technology could lead to solutions to reverse glyphosate resistance.

Here are some other needs identified in table group discussions after the presentations.

Session 1: Dr. Jeff Schoenau from the University of Saskatchewan on “Soil Nutrition: What We Know; What We Don’t Know and Effective Tech Transfer.”

Other needs identified:

- Growers need solutions that consider logistical challenges with regard to fertilizer storage, and of handling such large volumes at seeding.
- Under what situations do micronutrients and new crop nutrition products provide a return on investment? If growers had a protocol for test strips, and a coordinator to collect and analyze results, they could produce field-tested data for many more products and techniques.
- What is the relationship between fertility and disease management?

Session 2: Kristjan Hebert, managing partner with Hebert Grain Ventures, on “The 5% rule, and how incremental improvements can have a huge influence on profits.”

Other needs identified:

- Gains can be made on the machinery side. Use fuel-efficient combines, run equipment longer and use standard operating procedures (SOPs) to reduce breakdowns. Consider straight combining canola to bypass the swathing costs. Look at cost per bushel versus cost per acre.
- Each farm can establish benchmarks to compare themselves to other farms and to past performance, with the goal of identifying practices that improve profitability.
- Identify how to reduce canola seed mortality and dormancy, and how to maintain or improve canola seed placement with “conventional” planting speeds.

- Develop a research program for new and emerging pest issues.
- Identify optimal management for tight rotations.

Session 3: Kip Tom, managing member of Tom Farms in Illinois, on how his farm uses data to improve profit and productivity.

Other needs identified:

- Sensors and other data-collection tools could make it easier for growers to count plants, measure nutrient and water uptake, and determine real time insect and disease pressure.
- There is value in setting protocols for on-farm data and data sharing to provide opportunities for meta-analysis of big data to improve best practices.

Session 4: Day 2, Workshop 1 on “Stand Establishment.”

Other needs identified:

- There needs to be a simple description, based on science, showing the most important steps for stand establishment as they relate to canola yield potential. Dr. Neil Harker, with AAFC, says soil moisture is the biggest influence on stand establishment, followed by residue management, depth of seeding, seeding rate, and then several other factors.
- The iClicker poll results put “seed placement and depth” as the stand establishment factor with the largest impact on yield. Seedbed condition was second.
- Dr. Chantal Hamel, research scientist with Agriculture and Agri-Food Canada, Swift Current, spoke about the soil “spermosphere” around canola seed. Microbes in the spermosphere have a role in disease resistance, the impact of abiotic stress, and root health. Work on this is just starting in canola to see how growers may be able to enhance the spermosphere to improve crop health.
- Is there a way to have sensors measure seed depth, population and packing pressure so the drill can make adjustments on the fly?
- What space from seed to seed is needed for crop uniformity? What is the impact of doubles and triples and skips on for canola seedling survival?
- When it comes to seeding equipment, it would helpful to know how to adjust settings for specific conditions, such as seeding depth in dry soil, packing pressure by soil type and moisture, safe seed placed fertilizer rates based on seeding tool set up.
- How do growers best manage residue without burning or going back to tillage? How much residue is too much?

Session 5: Day 2, Workshop 2 on “Emerging pests and management strategies.”

Other needs identified:

- Dr. Rebecca Hallett, associate professor at the University of Guelph, offered possible management steps for swede midge based on what is known at this time. (1) A three-year crop rotation with one crucifer crop is an effective way to reduce swede midge populations. (2) Two carefully timed insecticide sprays may be sufficient if on at the right time. Swede midge prefer to lay eggs when canola is at the 7-leaf stage and early bud stage. Spraying should be done around the 8-9 leaf stage. (3) The earlier canola is planted the better for managing swede midge. (4) Tillage practices have not been successful in reducing swede midge populations, although fall tillage needs to be studied further. (5) A possible parasitoid of swede midge may have been discovered in Saskatchewan.
- iClicker poll results for the most difficult pests to manage were (1) sclerotinia stem rot, (2) herbicide resistant weeds and (3) blackleg, and the top three pests that should be a priority for more information/research were (1) sclerotinia stem rot (2) clubroot and (3) swede midge.

Session 6: Day 2, Research Project Updates