THE FUTURE OF CANADIAN CANOLA: APPLY THE SCIENCE OF AGRONOMICS TO MAXIMIZE GENETIC POTENTIAL.

52 BY 2025

KEEP IT COMING

WHERE WE HAVE BEEN

CANOLA PRODUCTION HAS SURPASSED THE INDUSTRY TARGET OF 15 MMT.

This was achieved for a variety of reasons: genetic improvement, improved agronomics and a significant increase in acres. But what will take us to 52 bushels per acre by 2025?

GENETICS IN THE PAST HAVE BEEN CENTRAL TO YIELD INCREASES

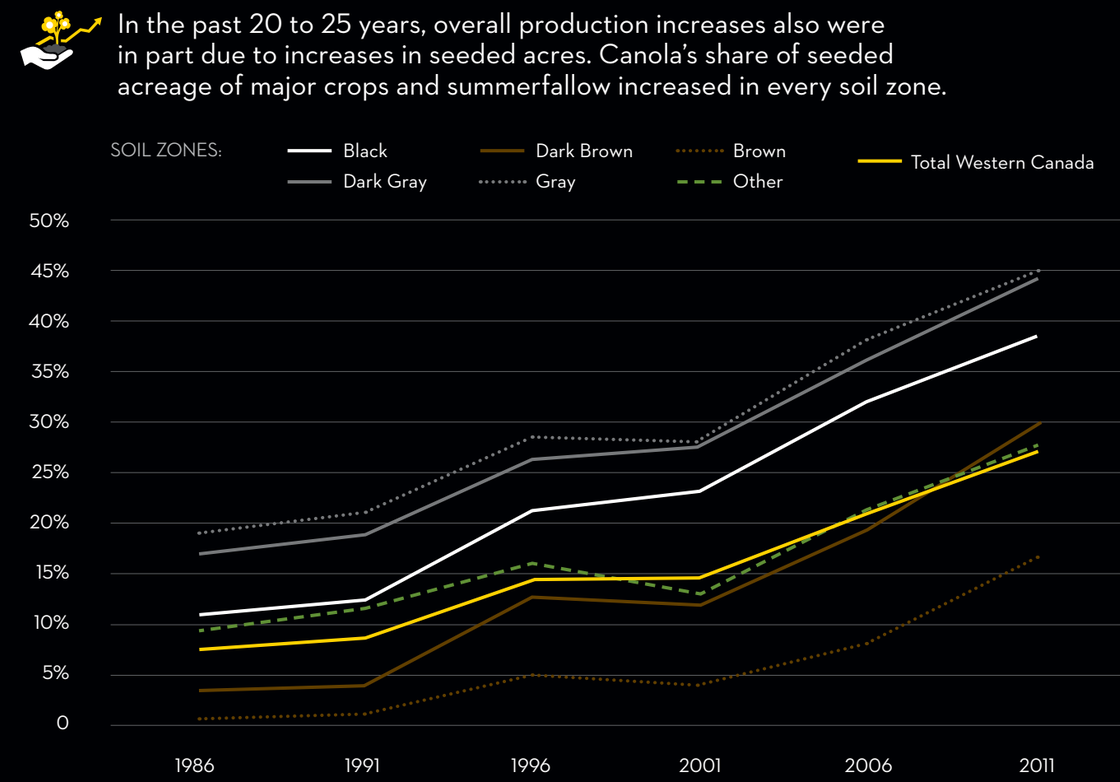
Canola producers and the value chain have benefited from increasing yields due to genetics and plant breeding. In 35 years, we've increased production from less than 20 bu/ac to a high of 40 bu/ac in 2013. Introduction of herbicide tolerant canola and hybrid canola has provided significant yield potential to producers and the canola value chain.

CANOLA GROWERS HAVE BEEN EARLY ADOPTERS OF NEW MANAGEMENT PRACTICES

Yield increases have occurred due to genetic improvement and significant research into and adoption of agronomy and management practices. Together, agronomy and genetics have allowed canola crops to better deal with stressful growing conditions that are part of Canadian agriculture – insects, disease, weeds, moisture and temperature.

BIG GAINS IN PRODUCTION WERE ALSO DUE TO INCREASED ACRES

In the past 20 to 25 years, overall production increases also were in part due to increases in seeded acres. Canola's share of seeded acreage of major crops and summerfallow increased in every soil zone.



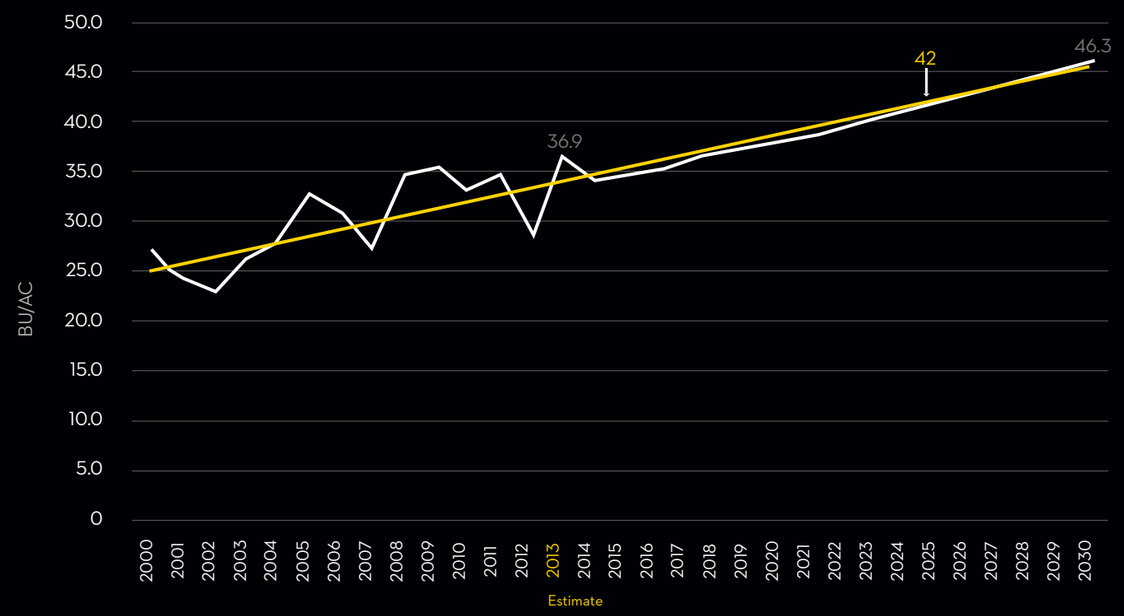
SOURCES: Statistics Canada (Provincial & Small Area Data); Informa (Soil Zone Estimates).
NOTE: Includes canola, wheat, barley, pulses, canary seed, flaxseed, mustard, oats, sunflower seed, rye, triticale and summerfallow. Year shown indicates middle year of 3-year average.

THE FUTURE

GENETICS CONTINUE TO PLAY AN IMPORTANT ROLE

Yield trends from canola variety registration trials show that genetic improvement, utilizing all of the modern genomics and breeding tools that are available, will take us from 34 bu/ac to 42 bu/ac in the next decade. This is an expected yield gain in canola varieties due to genetics alone.

CANOLA YIELDS ACTUAL AND PROJECTED WITH 2% GROWTH



THE FUTURE IS MOSTLY ABOUT APPLYING THE SCIENCE OF AGRONOMICS TO MAXIMIZE THE GENETIC POTENTIAL

BESIDES GENETIC GAIN TOTALLING 10 BU/AC BY 2025, AGRONOMY AND MANAGEMENT PRACTICES CAN PROVIDE AN ADDITIONAL 10 BU/AC OF YIELD.

These yield gains can be realized as follows:

- Plant Establishment – 3 bu/ac: Yield gains can be realized by a better understanding of seed mortality and seed placement with the goal of consistently reaching plant stands that lead to top yields.
- Fertility Management – 3 bu/ac: A small magnitude increase in fertility to meet the full nutritional requirements of the crop can lead to a larger magnitude increase in yield.
- Integrated Pest Management – 2 bu/ac: Yield gains can be realized through improved management of pests – weeds, diseases, and insects.
- Harvest Management – 2 bu/ac: Research is showing that we are losing 2 to 5 bu/ac at harvest. Improved swathing timing and adoption of straight cutting have been shown to put more yield in the bin and less seed on the ground.

THE CANOLA INDUSTRY IS NOT EXPECTING SIGNIFICANTLY MORE ACRES

In the future, production increases will come primarily from yield increases, not from converting non-arable land into farmland.

OUR BEST WISDOM IS CHANGING... AND GROWERS ARE LEADING THE WAY

Based on what science knew over the past decade, 3- to 4-year rotations were recommended.

Here is what has changed:

- Growers have taught us that more intensive rotations can be managed sustainably and profitably in many soil zones and regions of the Prairies.
- Historical crop insurance data indicates that there is a fairly consistent 20% yield reduction when producers grow canola on canola. But the latest research also indicates that there is a recovery of the yield potential with a 1-year break between canola crops.
- A break of 2 years between canola crops results in higher yields but the yield differences between 1- and 2-year rotation breaks are generally marginal. Analysis also indicates that producer management practices have considerable impact on yield.

INTENSIVE MANAGEMENT PRACTICES HELP TO MITIGATE DISEASE AND INSECT PRESSURE

Management issues surrounding disease, insect or weed pests should all play a role in determining the frequency of canola in a grower's general crop rotation and on an individual field.

INTENSIVE MANAGEMENT PRACTICES HELP TO MITIGATE DISEASE AND INSECT PRESSURE

MANAGEMENT ISSUES SURROUNDING DISEASE, INSECT OR WEED PESTS SHOULD ALL PLAY A ROLE IN DETERMINING THE FREQUENCY OF CANOLA IN A GROWER'S GENERAL CROP ROTATION AND ON AN INDIVIDUAL FIELD.

Key Management Practices:

Evidence from other canola growing areas in the world indicate that planned use of blackleg resistance genes in varieties may be an effective disease management tool that could mitigate blackleg risk. The latest science also demonstrates that an absence of canola on a blackleg infected field allowed canola crop residue and the potential disease inoculum levels to drop to a manageable level. However, even if a grower practices a 1 in 4 rotation, stubble in a neighbouring field could provide inoculum for disease development. So growers need to be aware not only of their own fields but also of fields around them when making decisions.

Intensive canola production has become possible through advances in weed control, primarily through novel trait technology.

Reduced tillage and improvements in equipment technology have allowed canola to be grown in areas where it may not have been considered possible in the past. From a soil conservation or sustainability perspective, herbicide tolerant canola has enabled the rapid adoption of reduced or zero tillage.

Growers will continue to need to recognize high-risk situations. These include high blackleg severity and incidence, increased flea beetle populations, positive clubroot identification and herbicide tolerant weeds. Growers will continue to need to adopt the principles of integrated pest management practices, which may include lower-risk rotations, and variability in plant species, herbicides and fungicides.

Growers' choice to adopt GM technology has led to more sustainable production. It has allowed for low till or zero till practices, so that the use of inputs to control weed and disease pressure has reduced. With low tillage, there is lower use of fossil fuels to manage the land base. All of this has contributed to Canadian canola being recognized in major sustainability schemes in global markets like the European Union, the United States and other markets.

AGRONOMIC EXTENSION REQUIRES A PARADIGM SHIFT

Going forward, the Canola Council of Canada will implement an approach that recognizes that each farm operation is unique and that growers need to make their own decisions depending on their own circumstances. The role of the Council is to ensure they have the best information based on the latest science.

To do that, we will harness the full capacity of industry agronomists, advisors and scientists to target growers with the right research results at the right time. Through this approach we will respond to each grower's unique circumstances, in order to maximize production from every single seed of planted canola.

Our approach is based on an intensive investment in agronomic research, technology transfer, collaboration and communication.

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