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# Newground<sup>®</sup>

A grower-to-grower Arysta LifeScience publication for farm management professionals

**Farmers'  
Roundtable:  
#agsocialmedia**

**What to plant  
in 2013?**

**How high can  
wheat yields go?**

**MARKETING WHEAT IN A NEW**

# **PLAYING FIELD**

Farmers mark the end of the Canadian Wheat Board's nearly 70-year monopoly as everyone adjusts to the new marketing freedom.

Advertising Supplement



# HOW HIGH CAN WHEAT YIELDS GO?

**Think 150-bushel wheat is impossible? You haven't heard from these two consultants who have seen yields go that high, and higher.**

**Average wheat yields exceeding 100 bushels an acre are possible on the Prairies and Northern Great Plains, according to two consultants who are helping clients reach for the high ring.**

And that's without using technology beyond the reach of ordinary mortals.

Phil Needham ([www.needhamag.com](http://www.needhamag.com)) grew up on a family farm in one of the major wheat production areas of England, where farms often achieve 200-bushel wheat yields with as little as 20 to 22 inches of annual rainfall. Today he works in several countries, including the U.S. and Canada, primarily as a wheat production advisor. He lives in Calhoun, KY.

Needham says: "A lot of little things can add up to a big difference. For the sake of a good article, we can narrow it down to just a few things, but over the past 20 years, we've done maybe 105 things to get where we are today."

When he relocated to Kentucky in the late 1980s, typical wheat yields were around 30 to 35 bushels an acre. In the past five years, the state average is now in the 65- to 75-bushel range.



Phil Needham

"We've got producers in Kentucky that I've worked with who are getting 90 to 100 bushels per acre on a good wheat year across the whole farm," he says.

"Miles Farm Supply brought me to this country. I headed a division called Miles Opti-Crop. We contributed to more than doubling the Kentucky state yield, and then took the principles of intensive wheat management that we developed in Kentucky across the country, from Texas to the Canadian Prairies.

"After Agrium purchased Miles Farm Supply about three years ago, most of the Opti-Crop people became independent. I work all over today; in fact I had 10 grower meetings in December in Western Canada," Needham says.

Ontario-born Steve Larocque, a generation younger than Needham, is an independent advisor at Three Hills, Alta. ([www.beyondagronomy.com](http://www.beyondagronomy.com)), and partner in a small family farm using the latest technology.

As a Canadian Nuffield scholar in 2007, Larocque studied firsthand the secrets of Guinness World Record holders for wheat in New Zealand. He's also studied production in England.



Steve Larocque in New Zealand.

Among his own clients in the past five years, he's seen the CDC Go variety of hard red spring wheat average 120 bushels per acre, and AC Harvest fields reach 110 bushels per acre in 2008 and 2010.

"Yes, I believe 130 and even 150 is possible – and that might be conservative. That's what gets me out of bed. I know there are so many aspects of wheat," Larocque says.

What's possible on the highest end? The Guinness World Record for highest wheat yield is 15.636 tonnes/hectare (232.64 bushels/acre), harvested from 21.9 acres by a New Zealand grower in March 2010.

Wheat's physiological yield potential in a perfect environment with unlimited nutrients, according to Larocque, is in the range of 75 tonnes per hectare (1,100 bushels/acre). He can do the math to prove his claim, but that's not the point. He knows there's room to improve, no matter how high the yield achieved.

For this *Newground* article, Larocque and Needham focused on two key yield factors for wheat – population potential and temperature sensitivity.

## » Population potential

Wheat can emerge too thick, or too thin, for maximum potential in a given field. The ideal population isn't obvious, but it can be learned by careful observation over time.

Larocque wants 30 to 35 seedlings per square foot across the field (about 325 per square yard) – although he has a little flexibility for soil quality. Thicker won't help because the tillers will die off. Thinner, in most cases, is below capacity.

Needham counts wheat heads just before harvest. At that time, he wants 500 to 600 heads per square yard, or about 60 per square foot.

Count, make a seeding rate adjustment for the next season and plan to count again, they say. Allow for mortality as high as 20 percent if you happen to seed wheat-on-wheat into heavy clay. And once you determine the optimum plant population for a specific field, be prepared to make some adjustments on seeding day, depending on seed size, soil moisture, fertility and planting dates.

To simplify the math, Larocque had a smartphone application to calculate the seeding rate developed for his clients and website, [www.beyondagronomy.com](http://www.beyondagronomy.com). It is available as an iPhone/iPad app in the iTunes App Store and an Android app in Google Play; search for "Seed Calculator" by Beyond Agronomy.

Along with targeting the ideal population with seeding rate, they suggest:

- Try two or three varieties in the same field to determine which performs best in your field and management systems. There can be big differences.
- Look for large, plump kernels to plant. Large seeds usually are more vigorous, and worth a bit more from the

supplier. The seed dealer may be willing to separate them with a gravity table.

- Use fungicide seed treatments, and be sure they are uniformly applied to the seed so they have the best chance of emerging on the same date.
- Use a good seeding system with independent depth control to achieve a uniform seeding depth.
- Use the narrowest row spacing that's practical. For people achieving 200-bushel/acre wheat yields and more in western Europe, standard row separation is only 4 to 5 inches.
- Apply base nitrogen at seeding followed by in-crop nitrogen to bridge the gap between initial yield expectation and the yield potential determined later in the growing season.

## » Soil temperature and yield

Understanding that wheat is very temperature-sensitive also can lead to ways to capture more yield potential.

For instance, a crop may take five or six days to emerge, due to soil temperature variations under uneven trash cover. Uneven emergence is a huge factor in final yields, according to both agronomists.

"We need residue management systems that can chop and spread in tough conditions, not just under ideal conditions," Larocque says.

Needham suggests that many growers can improve soil temperature uniformity by cutting back combine header sizes to match crop residue spread. A well-matched header and residue spreader can eliminate or reduce fall harrowing operations, lead to more uniform emergence, more timely in-crop operations and as a result, better yields.

As much as possible, wheat needs cool growing conditions to achieve maximum yield. Winter wheat needs to be planted ahead of Sept. 15; spring wheat needs to be in the seedbed by late April, if possible.

By late May, seedling wheat is stressed to the max as it converts into reproductive growth. From boot stage to flowering is the most critical time for yield. Temperature drives the rate of the processes during this period, and anything warmer than 18° C (64° F) pushes the plants to cut back the processes that produce kernels.

Population and temperature could be chapters in a book on the issues and management practices that can lead to higher wheat yields. Larocque and Needham offer much more advice in person, through newsletters or blogs, and their websites.

"Most guys, if they've got weaknesses, could increase their yields if they just did some of those very basic things a little bit better," says Needham. And as Larocque says, there's always room to improve. 🌱