



FALL 2022

BEYOND SEED[®]

YOUR INFORMATION SOURCE FOR CANOLA, SUNFLOWERS AND WHEAT.





WINFIELD UNITED DOUBLING DOWN ON ANSWER PLOT® PROGRAM

6



GROUNDBREAKING A.I.R.™ TRAIT COMING TO CROPLAN® SUNFLOWER PORTFOLIO



PRECISION WHEAT PILOT PROGRAM BUILDS NEW MARKETING OPPORTUNITY FOR PRODUCERS

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We always welcome feedback and we would love to hear from you. Please send comments to:

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LAND O'LAKES® RECIPE: BLACKBERRY COBBLER

Preparation time: 20 minutes **Total time:** 1 hour 15 minutes **Serves:** 8

Delicious in any season! Sweet blackberries, sugar and lemon zest are topped with fluffy almond biscuits. We recommend serving warm with a generous scoop of vanilla ice cream.

INGREDIENTS:

TOPPING

1 cup all-purpose flour
 1/2 cup finely chopped almonds
 1 1/2 teaspoons baking powder
 1/4 teaspoon salt
 1/2 cup cold Land O'Lakes® Butter, cut into chunks
 1/2 cup buttermilk*
 1/4 teaspoon almond extract
 1 tablespoon sanding sugar

BERRIES

18 ounces (4 cups) fresh or frozen blackberries (thawed)
 6 ounces (1 cup) fresh or frozen blueberries (thawed)
 3/4 cup sugar
 3 tablespoons cornstarch
 2 teaspoons freshly grated lemon zest

Vanilla ice cream, if desired

*Substitute 1 1/2 teaspoons lemon juice or vinegar and enough milk to equal 1/2 cup. Let stand 5 minutes.

DIRECTIONS:

Combine all berries ingredients in medium bowl; toss lightly to coat. Spread into 11x7-inch glass or ceramic (do not use metal) baking dish. Let sit 15 minutes for berries to create juice.

Heat oven to 375°F.

Meanwhile, combine flour, almonds, baking powder and salt in medium bowl. Cut in cold butter until mixture resembles coarse crumbs. Stir in buttermilk and almond extract. Mix until combined (batter will be very thick).

Drop batter by tablespoons onto berry mixture. Sprinkle with sanding sugar. Bake 45-55 minutes or until deep golden brown and center of cobbler is bubbling. Let cool at least 1 hour.

Serve warm with generous scoop of vanilla ice cream, if desired.

NUTRITION FACTS

Calories 340
 Fat 15 g
 Cholesterol 30 mg
 Sodium 280 mg
 Carbohydrate 47 g
 Protein 5 g
 Dietary Fiber 5 g



CROPLAN



A.I.R.



GROUNDBREAKING A.I.R.[™] TRAIT COMING TO CROPLAN[®] SUNFLOWER PORTFOLIO

**NEW TECHNOLOGY WILL PROVIDE TOLERANCE TO
BEYOND[®] AND EXPRESS[®] HERBICIDES**

Mark Torno, WinField[®] United Diverse Field Crops Product Manager Wheat, Canola, Sunflower
Twitter: @MarkTornoatWork

Advancements in sunflower production technology have been limited over the past 13 years, but that will soon change with the introduction of Syngenta's new A.I.R.[™] technology trait to the CROPLAN[®] sunflower portfolio.

Launched in 2005 and 2010, respectively, the Clearfield[®] and ExpressSun[®] sunflower production systems remain a powerful tool for farmers in the battle against yield limiting weed pressure. But one thing these systems lack is flexibility. A.I.R.[™] sunflowers, however, have a natural tolerance to both Beyond[®] and Express[®] herbicides, providing farmers with a new level of flexibility, simplicity and improved performance. WinField United has been working hand-in-hand with Syngenta to bring this trait to market, and presently we are the only company researching A.I.R.[™] sunflowers in the United States.

NEW TRAIT SHINES IN TRIALS

Express[®] and Beyond[®] herbicide proposed label changes that include the addition of sunflowers with the A.I.R.[™] trait are pending, but two years of Answer Plot[®]

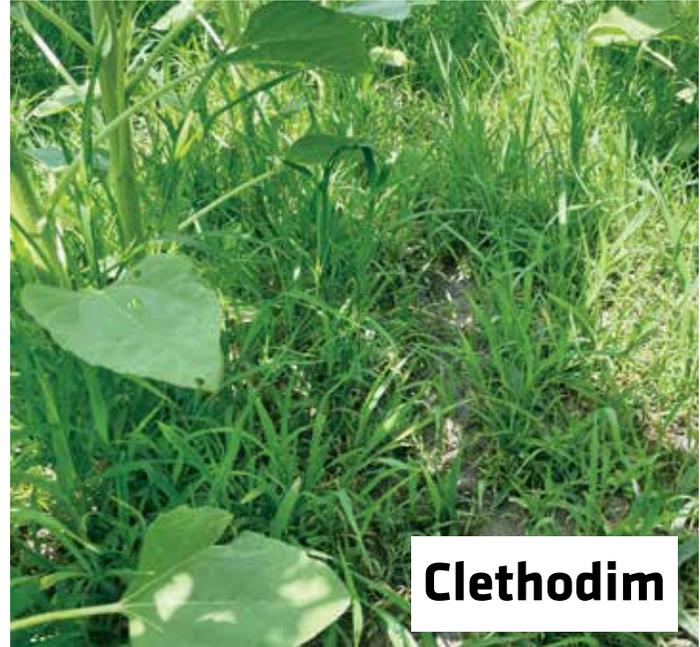
research have shown that the trait exhibits excellent tolerance to both chemistries. Once these label changes are approved, farmers who plant CROPLAN A.I.R.[™] sunflowers will have some new game-changing weed management options at their disposal, consisting of some of the broadest post emergent coverage available.

Make no mistake; we really put the A.I.R.[™] trait to the test in our field trials to expose any concerns. Last year, we tried to throw everything we could at it to measure any crop damage. We wanted to expose sunflowers with the A.I.R.[™] trait to some worst-case scenarios, and the trait gave a very impressive performance.

KEY BENEFITS OF A.I.R.[™] SUNFLOWERS

So just how much will producers benefit from growing CROPLAN A.I.R.[™] sunflowers? Here's a look at the top three advantages the new trait offers.

1. Flexibility: Growing CROPLAN sunflowers with the A.I.R.[™] technology trait will provide producers with a



Beyond® herbicide is capable of providing excellent control of grassy weeds; the key is to apply it early. The test strip pictured above left was treated before weeds reached 2 inches in height. The photo above right shows a test strip from the same field that was instead treated with a clethodim product at the same application timing.

great deal of flexibility when choosing the weed control chemistry they use in their fields. Instead of being locked in to either Express® herbicide or Beyond® herbicide when they purchase their seed in the winter, farmers can base their herbicide decision on the weed species present in their fields at the time of application in June or July.

2. Expanded weed control: Farmers who have fields troubled by both grassy weeds and broadleaf weeds will have the ability to use both weed control chemistries when treating CROPLAN A.I.R.™ sunflowers. For example, producers will be able to apply Beyond® herbicide early to deal with the likes of grassy weeds like wild oats and foxtail. Then they can apply Express® herbicide to control broadleaf weeds and tough weeds like Canada thistle.

The goal is for Express® and Beyond® herbicides to be labeled for use on CROPLAN A.I.R.™ sunflowers in the same tank mix, which would have the potential to improve efficiency and simplicity. Beyond® herbicide would provide great grass control in a tank mix scenario, along with improved residual control of broadleaf weeds and late flushes of grassy weeds. Express® herbicide would be utilized for its additional broad-spectrum control of larger broadleaf weeds.

3. Manage against herbicide resistance: Some farmers are finding grassy weed populations in their fields that have developed resistance to Group 1 chemistries like Section® Three herbicide, which is often tank mixed to control grassy weeds in the ExpressSun® sunflower production system. Being able to apply Beyond®

herbicide over CROPLAN A.I.R.™ sunflowers can help farmers knock out those weeds and help prevent herbicide-resistant populations from overtaking their fields.

Speaking of Beyond® herbicide, one thing we've been shocked by is the strong grass control it put forth in our field trials. Farmers occasionally share that they didn't achieve the control they were hoping for when using the product, but in many cases, late application timing is to blame. The key factor in optimizing the strength of Beyond® herbicide is to apply it very early. Think of it as an over-the-top pre-emerge treatment. Control decreases when grassy weeds reach 2 inches in length, but as the photo above left shows, it can deliver really strong performance on emerging grasses.

As mentioned earlier, we're in the second full year of testing the herbicide tolerance of A.I.R.™ sunflowers, and we're really excited by what we're seeing. We've tested four experimental CROPLAN A.I.R.™ hybrids so far, and one in particular is close to being launched in a limited release. You can rest assured that more are in the pipeline.

Interested in hearing more about A.I.R.™ sunflowers? Watch for updates in the next issue of *Beyond Seed®* and contact your local WinField® United retailer to learn if they'll have the potential to be a good fit on your acres.

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Ryan Moeller, WinField® United Seed Product Manager, answers a question during the sunflower breakout session at the Answer Plot® field day in late July.



WINFIELD UNITED DOUBLING DOWN ON ANSWER PLOT® PROGRAM

WHEAT, CANOLA & SUNFLOWER TRIALS RETURN TO THE SPOTLIGHT

Ryan Moeller, WinField® United Seed Product Manager

July 21 marked a significant milestone for WinField United, as we celebrated our recommitment to the Answer Plot® program with a large-scale field day at the temporary Answer Plot Innovation Farm situated in central North Dakota, just north of Bismarck, ND. More than 200 farmers, agronomists, cooperative representatives, WinField® United staffers and members of the media turned out for the event.

In addition to observing how crops like hard red spring and winter wheat, spring and winter canola, field peas, sunflowers and forage sorghum were progressing, attendees also learned how diversified crop production can help open

new markets for farmers, and help mitigate financial risk while helping to improve soil health, break pest life cycles, maintain soil nutrients and increase water infiltration.

For the past few years, we've relied on research crews from universities and private companies to carry out Answer Plot trials for diverse field crops like canola and sunflower. While the data we received from these contract crews has been solid, the protocols left little room for flexibility when it came to adjusting management practices based on growing conditions. Now we have our own research team managing the trials, enabling us to respond to challenges encountered in the field in real time.

In addition to this new Answer Plot location north of Bismarck, we've also established several satellite Answer Plot sites located throughout Idaho, Kansas, Minnesota, Montana and the Dakotas. Ranging from 10 to 15 acres in size, the demonstration plots at these sites will help strengthen our data pool by providing multiple Response to Nitrogen (RTN) and Response to Population (RTP) checks from the region.

To top it off, we're still contracting with research crews from universities and private firms in other popular canola- and wheat-growing areas of the United States so we can continue to gather quality data to help identify where experimental

Mark Torno, WinField® United Diverse Field Crops Product Manager, led the canola breakout session at the Bismarck Answer Plot® field day.





Jamie Kloster, CROPLAN® Seed Product Manager, downloads Answer Plot® Field Day attendees on wheat observations at the Bismarck Answer Plot location.

products and new management practices perform best.

So what kinds of research trials are we performing at the Bismarck Answer Plot location and satellite plots in 2022? Perhaps a better question is “What *aren’t* we looking at?” As field day attendees can testify, we’ve implemented a wide range of trials that encompass several crops, and some management practices that are limited to a specific crop. Here’s a closer look at what each of these entail.

ALL CROPS

Seed health: Trials in spring-planted wheat, canola and sunflower are examining the performance of seed treatments and seed protection products applied in-furrow to help determine the impact they have on yield potential. Products included in the trials include Warden® Cereals WR11 seed treatment for wheat, Lumiderm® insecticide seed treatment for canola and CruiserMaxx® Sunflower seed treatment.

Response scores:

- Each of our spring and winter crop products are being treated with differing amounts of nitrogen (N) to help gauge optimum N management for each variety or hybrid. The data will allow us to continue assigning Response to Nitrogen (RTN) scores to our new wheat, canola and sunflower products so we can help farmers fine-tune their fertility investment.
- We’re also planting these products at low and high populations to help us pinpoint Response to Population (RTP) scores. These scores are valuable because they help growers identify which products can be planted at lower populations without sacrificing yield potential, and which products will show high yield potential at higher populations – thus helping optimize profit potential by adjusting seed inputs based on this data.

- Finally, we’re looking at how our wheat and sunflower varieties perform when treated with a fungicide vs. an untreated check so we can provide each variety’s Response to Fungicide (RTF) score. Wheat is being treated at herbicide timing, while the sunflower data, which is aimed at reducing *Phomopsis* infection/ losses, will be based on an early bud treatment of the sunflower fungicide trials. The resulting RTF scores will help drive management decisions for increased yield and protein in wheat, and *Phomopsis* reduction in sunflower to help prevent lodging.

WHEAT



Varietal selection: We’re observing a number of promising wheat germplasm from both US and global wheat breeding programs at our Answer Plot locations this year, and we’re looking forward to see how they perform. Top performers could be released to the public in as little as a year or two.

CANOLA



Hybrid selection: Thanks to our relationships with major breeders, we’ve also planted several encouraging experimental canola germplasm at our Answer Plot locations. Some of these may be available for planting in your fields in the near future.

Shatter trials: Armed with blowers and catch trays, our Answer Plot team will work hard to replicate harsh weather so we can measure the amount of seed loss and pod drop sustained in the worst possible shatter conditions. We’ve always had to rely on Canadian data for shatter scores; sometimes this data came from conditions similar to what



Above: One of more than 200 attendees signs in at the Bismarck Answer Plot® Innovation Farm field day held back in July. Below: Kyle Gustafson, WinField® United Market Development Specialist, gives an in-depth presentation on sunflower root systems.



Above: Gary Nowaczyk, Director & Business Lead for CROPLAN® Alfalfa, Forages and Diverse Field Crops. Below: Ryan Moeller, WinField United Seed Product Manager, introduces the new A.I.R.™ sunflower trait.



Above: Mark Torno, WinField United Diverse Field Crops Product Manager, partakes in an interview with Red River Farm Network. Below: Mick Miller, CROPLAN Winter Canola Product Manager, discusses plant health at the canola breakout session.



we endured in the upper Midwest, but sometimes the conditions were much different. Performing this research on US soil will allow us to base shatter scores on data from our climate, which will be important when we release new CROPLAN® canola products in the near future.

Micronutrient applications: How much do our canola products benefit from supplemental applications of micronutrients like sulfur (S) and boron (B)? We hope to determine that by looking at how foliar treatments impact yield potential vs. an untreated check.

SUNFLOWERS

A.I.R.™ Trait Technology: Likely one of the most significant advancements in sunflower production in several years, A.I.R.™ trait technology could change the way most sunflower producers manage their crop. A.I.R.™ sunflowers have a natural tolerance to both Beyond® and Express® herbicides, giving an incredible amount of flexibility to the farmers who plant them. Instead of being confined to the restrictions of the Clearfield® and ExpressSun® production systems, growers

can take advantage of both chemistries on the same crop. For example, they can use Beyond® herbicide if their crop encounters grassy and small broadleaf weeds, but also use Express® herbicide if larger broadleaf weeds like Canada thistle, lambsquarters and buckwheat present concern. We're in the second full year of testing the herbicide tolerance of A.I.R.™ sunflowers, and we're very pleased with the results. We've tested four different varieties so far, and one is close to being released. Plus, more A.I.R.™ hybrids are under development and testing in 2022!

Ultra-Early Hybrid Testing: For the first time we are planting an ultra-early hybrid trial with two planting timings: one early/on time, and one late in the season. The goal of this trial is to identify opportunities for growers to plant sunflowers late in the season (due to wetness, a previous early cut of a forage crop, etc.) and still harvest a profitable sunflower crop with acceptable oil and yield with ultra-early hybrids versus a more traditional "early" type of product. Additionally, we will look at opportunities for early planting and harvest for potential double crop opportunities, such as soybeans in Kansas, and spring forage or winter wheat in the Dakotas.



Above: The weather couldn't have cooperated any better for the Bismarck Answer Plot field day. Below: Farmers always recognize Answer Plot field days as good educational opportunities.



Above: This dad had his hands full at the Bismarck Answer Plot Innovation Farm field day...literally! Below: Few get more passionate about wheat agronomics than Jamie Kloster, CROPLAN Seed Product Manager.



Biostimulant trial: We're making a foliar application of YieldOn® biostimulant on sunflowers to determine how product benefits like cell metabolism modulation, division, expansion, improved transportation of sugars and nutrients, and enhanced lipid biosynthesis and transport translates into optimizing yield potential.

Screening trial: This trial will help increase the number of hybrids tested and also speed up our research and development phase by testing a large number of experimental sunflower hybrids on a small scale. Each hybrid will be planted in two rows, 15 feet in length. Observing more germplasm faster will enable us to fast track those that show the most promise and advance them into larger performance trials, which can increase the chances of finding that new top-performing hybrid!



FIELD PEAS

Screening trial: Yep, you heard right. Field peas haven't been a typical Answer Plot crop in the past, but increased demand for different protein sources for human consumption and high quality animal feed are

amplifying interest in the crop. Therefore, we're running yield trials for several experimental products to determine if there are any exciting new germplasm with improved grain quality to bring to market. We're also performing trials with plant growth regulators (PGRs) and a fungicide to get a better handle on how these products can help optimize the yield potential of field peas.

To sum it all up, we had a lot going on at the Bismarck Answer Plot Innovation Farm this summer, and even more is planned for future growing seasons. In fact, we recently closed on the purchase of a permanent 162-acre Answer Plot Diverse Field Crop Innovation Farm just south of Washburn, ND, which we're really excited about. Stay tuned to the next issue of *Beyond Seed*® to learn about our most notable findings from this year's research. If you're interested in visiting the site or an Answer Plot satellite location near you, contact your local WinField United retailer.

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PRECISION WHEAT PILOT PROGRAM BUILDS NEW MARKETING OPPORTUNITY FOR PRODUCERS

Christine Colby, Marketing Manager, WinField® United Services & Connections Team



It's no secret that the commodity market for wheat has long been centered on yields and protein content. This makes sense on the surface, but when digging a little deeper, you'll be surprised to learn that the current market trades in such a way that wheat buyers who need ingredients are left to source them from the river of commodity wheat.

Because wheat quality has declined over the past five decades, the need for the baking industry to source quality ingredients and have intelligence around their products is more important than ever. Working in tandem with Farm Strategy and a number of industry stakeholders, WinField United has created Precision Wheat – a pilot program that is laying the groundwork for significant improvements in the way those with ingredient demands source high quality wheat with favorable gluten content. Once implemented, this program has the potential to provide promising new opportunities for producers and distributors to earn a premium for growing and supplying grain that meets the quality standards end users are looking for.

We're looking to optimize the whole system – including genetics and agronomics, grain quality testing, storage and transportation, milling and farm sustainability.

Identifying all the stakeholders and bringing them together to build this supply chain is like fitting together the pieces of a complex puzzle, but if there is a system equipped to do it, it's WinField United and our retailer-owners. But before we take a closer look at everything this pilot program entails and how it has the potential to change the wheat production industry for the better, let's look at how we got here in the first place.

POSITIONING FARMERS FOR SUCCESS

As a subsidiary of Land O'Lakes – a farmer-owned cooperative – WinField United is in the unique position to invest in projects that have our member-owners' best interests in mind. Unlike large investor-owned companies that focus mainly on profits, one of our most important objectives is to provide farmers with value-added services that help grow their business.

The responsibility of finding and implementing these initiatives falls on the shoulders of the WinField® United Services & Connections Team. We actively seek out new opportunities to better connect our farmer-owners to new markets in the four "Fs" – food, feed, fiber and fuel. The overriding goal is to better position growers for success by



increasing their sources of revenue.

This might be the first time you've heard of our team, but you've surely heard about some of the initiatives we created. In recent years, we've brought you programs like WinField United SECURE™ grower financing and the WinField United Advanced Acre® Rx prescription program, a yield warranty platform for producers. These programs weren't designed to add to our bottom line, but rather to help member-owners achieve success in the ultimate risk-reward business of farming.

In our search for new revenue opportunities for farmers, we soon discovered that commodity markets don't always meet the needs of the industries they serve – a perfect example being the baking industry. When producing wheat, farmers have always been incentivized to push for high yields and protein content. But as it turns out, this model of grain quantity over quality has forced end users with quality needs to source from a grain system more bent toward trading than creating value.

“You would be surprised at what processors and end users pay for and the hoops they have to jump through to make quality ingredients and food from commodity wheat,” says Andrew Hoelscher, president of Farm Strategy, LLC. Hoelscher has been working towards developing a program that provides incentives to farmers based on the quality of the wheat they deliver, so we were excited to bring him and his expertise into the fold as a Precision Wheat pilot program partner.

WHY GLUTEN?

A combination of the natural proteins found in wheat, gluten plays an important role in creating the strength and elasticity dough needs to stretch and rise. Without it, baked goods can't hold their shape.

When high-volume bakers make bread, each batch of dough needs to be mixed for the right amount of time to achieve ideal consistency. They want a recipe that gives them the flexibility needed to account for all the variability in wheat quality in their mixing bowl. If the gluten level in flour isn't ideal, dough stability is altered, and an entire batch ends up being over or under mixed, forcing it to be discarded. To put it in perspective, approximately 150 loaves of bread emerge from an industrial oven every minute when things are going smoothly. So, completely scrapping a batch of dough can put a big dent into their production flow and profit potential.

Since the U.S. commodity market doesn't place a



premium on wheat quality, sourcing grain with favorable extractable gluten content is challenging and time-consuming. Another Precision Wheat pilot program partner, which is one of the largest manufacturers of wheat gluten in the United States, works with Farm Strategy to literally test grain bin after grain bin to find the wheat quality they're looking for.

That's right. Currently, finding high quality grain is a lot like searching for needles in a haystack. So, instead of searching for those needles after the fact, wouldn't it make a lot more sense to grow them? By producing higher quality wheat that meets the specifications of industrial bakers, American farmers have the potential to boost their farm's revenue and help these food companies become more efficient and better meet consumer demand.

GENETIC SELECTION & IMPROVED AGRONOMICS

Fortunately, WinField United has the structure in place to help farmers achieve better wheat quality. A number of internal groups are playing a role in the Precision Wheat pilot program, including the Diverse Field Crops team, research and development, data analytics and SureTech® Laboratories – a full-service agricultural lab dedicated to quality and consistent results with efficient turnaround time.

“The findings from our research are revealing a very real opportunity for growers to produce the kind of wheat quality that these end users are looking for,” reports Mark Torno, Diverse Field Crops Product Manager. “We're finding some wheat varieties tend to provide better quality for gluten extraction and bread making than others, but still they have



to be managed appropriately to achieve the best results. It starts with seeding a good stand with uniform emergence and growth, and continues throughout the season.”

Randy Brown, WinField United Crop Protection Product Manager, has overseen a wide range of hard red winter wheat crop trials aimed at identifying the management practices that help improve wheat quality and extractable wet gluten content. Many of these practices have been implemented in the fields of farmers in Kansas who are participating in the pilot program.

“As a form of protein, gluten needs adequate nitrogen (N) and sulfur (S) levels to form,” Brown explains. “So, we’re working to determine how much of these nutrients should be given to each wheat variety to increase extractable gluten levels, and whether they should be applied upfront or via split applications. We’re also utilizing the NutriSolutions® tissue sampling program to learn more about how we can optimize N and S efficiency and improve the deposition of these nutrients in the grain.”

Other fertility and crop protection treatments that Brown and his team of agronomists are looking at include:

- Ascend® Plant Growth Regulator applied as a seed treatment, which helped accelerate fall growth and extend leaf area index, two factors that are believed to favor gluten development.
- Micronutrients like zinc (Z), manganese (Mn), boron (B) and potassium (K) are all functional parts of protein, so applications of MAX-IN® ZMB and MAX-IN® K micronutrients are being examined to learn about their impact on gluten levels.

- Fungicide treatments optimized with MasterLock® adjuvant are being analyzed to determine how much they help improve overall efficiencies within the plant.
- Biostimulant products that are touted to assist with N use efficiency and stress mitigation – namely improving the crop’s tolerance to heat and drought – are also being studied.

“Another thing we’re looking to achieve is spring tiller reduction”, Brown adds. “The tillers that develop later on the plants are typically lower in quality than the first tillers that form, so we’re looking at how factors like genetics, higher population density and N management can help reduce tillering and improve overall wheat quality.”

Once we’ve analyzed the data from this year’s Precision Wheat crop, we’ll provide program participants with a list of around 20 varieties of hard red winter wheat from the CROPLAN® brand lineup and others that tend to deliver the best grain quality. We will also provide a productive model of in-season management practices that, if followed, can help give growers a better handle on the quality of their wheat crop prior to testing.

TESTING FOR QUALITY

Of course, once high quality wheat is grown, it still needs to be tested to confirm it meets food company specifications. So going back to that needle in a haystack metaphor, won’t these companies still need to dedicate a lot of time and resources to testing? Not anymore, because SureTech Laboratories is taking on a significant portion of the testing in its new Crop Profile Laboratory, and it has two big advantages going for it.

First, SureTech professionals test the quality of grain supplied by farmers who participate in the Precision Wheat program, meaning there will be a lot more needles in those haystacks. And second, they have significantly reduced the amount of time it takes to run grain through the testing process.

When sourcing high quality wheat, mills hope to find flour characteristics like extractable gluten, water absorption and stability. (The wider window for mixing time, the better.) Until now, this testing process has typically taken more than 30 days, which is one of the main reasons the wheat market hasn’t been able to offer a premium for true wheat quality. Grain elevators can perform a simple protein test in a minute or less, but testing for true quality requires wheat to be processed into flour and tested in a controlled environment. SureTech, however, has reduced that testing period to only 10 days, which will enable

mills, distributors and farmers to make better and faster decisions when it comes to buying and selling grain.

RETAILERS STREAMLINE THE PROCESS

Partnering cooperatives have been incredibly important participants in the Precision Wheat pilot program. Without them, we wouldn't even have a program. Their local agronomic expertise, grower relationships, grain execution capabilities and enthusiasm to co-author this strategy has been invaluable.

We're currently working with four retailers in Kansas that have helped streamline a number of steps in the process, including:

- Identifying and working with hard red winter wheat producers interested in producing high quality grain.
- Serving as a conduit between SureTech laboratories and growers by submitting grain samples and receiving test results.
- Assisting in grain marketing.
- Providing access to rail lines and trucking that can transport grain to mills.
- Offering agronomic support, in-season decision-making advice and local expertise.
- Helping farmers secure proper storage to maintain grain quality until it's delivered.

Throughout this entire initiative, I've been amazed by just how many stakeholders are truly involved in the process. Whether they're hard-working farmers, industry partners, federated cooperative system members, or employees of WinField United or another Land O'Lakes subsidiary, everyone has been dedicated to helping the Precision Wheat pilot program achieve success. Now that we have proof of concept, we're looking forward to launching the program on a wider scale in the future.

PRECISION WHEAT PILOT PROGRAM PARTICIPANTS

FARM STRATEGY

Develops supply chains and connects end users with grain handlers to incentivize high quality grain movement.

FOUR KANSAS RETAILERS & SEVERAL SELECT GROWERS



A full-service agricultural lab owned by WinField United, dedicated to quality and consistent results with efficient turnaround time.



The Land O'Lakes sustainability business that helps farmers target insights to better tailor their management practices and implement new technologies on a field-by-field basis.

Interested in learning more about improving the quality of your hard red winter wheat crop? Reach out to your local WinField United retailer and stay tuned for the next issue of *Beyond Seed*®, which will include a program update and a closer look at how partnering labs have helped develop better and faster testing protocols for wheat quality.

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PROBLEM GRASSES BEWARE



CROPLAN® CP3201AX COAXIUM® HARD RED SPRING WHEAT AVAILABLE FOR 2023 SEEDING



The CoAXium® Wheat Production System combines dedicated industry stewardship with the patented, non-GMO AXigen® trait, which is tolerant to an in-crop application of Aggressor® herbicide.

Aggressor® herbicide can control most winter annual grasses (including Group 2 (ALS) resistant biotypes), along with volunteer cereals and some perennial grasses. Most wheat herbicides lack this selectivity, making CP3201AX CoAXium® spring wheat a terrific addition to your weed control toolbox.

Interested in planting your fields to CROPLAN CoAXium® spring wheat? Contact your local WinField® United retailer for details.

CP3201AX Product Description*

- Can control resistant weeds by utilizing CoAXium® technology driven by Aggressor® herbicide using an ACCase inhibitor
- Nicely balanced product for both yield and protein potential, for success across markets
- Good agronomics and yield potential, especially in moderate to higher yielding environments
- Medium-late maturity with earlier flowering and longer grain fill; medium plant height

Days To Heading: 55

Days To Maturity: 87

Shatter: 2

Height: Medium

Placement on Irrigation: 2

CHARACTERISTICS

	NOT RECOMMENDED	EXCELLENT
STANDABILITY	■ ■ ■ ■ ■	■ ■ ■ ■ ■ 2
FUSARIUM HEAD BLIGHT	■ ■ ■ ■ ■	■ ■ ■ ■ ■ 1
TEST WEIGHT	■ ■ ■ ■ ■	■ ■ ■ ■ ■ 2
PROTEIN	■ ■ ■ ■ ■	■ ■ ■ ■ ■ 1

Scale 1 = Excellent 2 = Strong 3 = Acceptable 4 = Manage 5 = Not Recommended

* Product descriptions and ratings are generated from Answer Plot® trials and/or from the genetics supplier and may change as additional data is gathered.

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NORTH EXAMPLE CROP BUDGET SHEET*

Many factors go into determining which crops to rotate to and how to manage them, so these decisions shouldn't be based on gut reactions alone. At WinField United, we're focused on giving you the right tools to help you decide what's best for your acres. For that reason, we like to provide example crop budget sheets in *Beyond Seed*® magazine.

Crop values and input costs are constantly changing and often vary by region. Therefore, the figures in these budget sheets are always ballpark estimates. But the analysis of income, estimated expenses, fixed costs and

return on investment (ROI) is an accurate guideline when it comes to helping you think through the pros and cons of each crop and its management options.

We encourage you to work with your local agronomist to use their electronic versions of these budget sheets to help you customize the figures for your fields. It's a great collaborative tool and it puts you and your agronomist on the same page – both literally *and* figuratively.



INCOME	CROPLAN® Spring Wheat	Public Spring Wheat	Winter Wheat	Soybean Enlist®	Soybean Xtend®	CROPLAN TruFlex™ Canola	CROPLAN LibertyLink® Canola	InVigor® LibertyLink® Canola	Peas (Food)	Sunflower ExpressSun®	Corn
Average Yield	66	56	68	36	36	20.00	20.00	20.00	45	21.00	140
Price*	\$8.50	\$8.50	\$7.75	\$12.90	\$12.90	\$28.80	\$27.00	\$27.00	\$8.50	\$29.64	\$5.50
Income/Acre	\$561.00	\$476.00	\$527.00	\$464.40	\$464.40	\$576.00	\$540.00	\$540.00	\$382.50	\$622.44	\$770.00
Plus Rotational Value											
ESTIMATED EXPENSES*											
VARIABLE COSTS											
Seed											
Seed	\$30.64	\$30.36	\$23.60	\$55.20	\$55.20	\$40.41	\$56.23	\$61.26	\$28.75	\$31.75	\$92.19
Seed Treat/Inoculant	\$4.53	\$5.93	\$0.00	\$9.50	\$9.50	in bag	in bag	in bag	in bag	in bag	in bag
Crop Protection Products											
Tech Fee	—	—	—	in bag	in bag	in bag	in bag	in bag	—	in bag	in bag
Chemicals	\$39.89	\$29.58	\$29.58	\$82.13	\$78.56	\$12.89	\$17.14	\$17.14	\$60.06	\$28.44	\$37.56
Fertilizers											
Fertilizer	\$123.26	\$100.72	\$133.15	\$8.93	\$8.93	\$99.75	\$99.75	\$99.75	\$12.93	\$66.66	\$154.82
Field Operations											
Fuel & Lubrication	\$10.50	\$10.50	\$10.50	\$10.50	\$10.50	\$10.50	\$10.50	\$10.50	\$11.50	\$11.50	\$13.50
Repairs	\$18.00	\$18.00	\$18.00	\$18.00	\$18.00	\$18.00	\$18.00	\$18.00	\$18.00	\$18.00	\$19.00
Drying	—	—	—	—	—	—	—	—	—	\$7.00	\$12.00
Misc. Variable Costs											
Crop Insurance	\$11.00	\$11.00	\$11.00	\$12.00	\$12.00	\$12.00	\$12.00	\$12.00	\$12.00	\$11.00	\$22.00
Operating Interest	\$9.51	\$8.24	\$9.21	\$7.85	\$7.71	\$7.74	\$8.54	\$8.75	\$6.30	\$6.97	\$14.04
FIXED COSTS											
Machinery	\$40.00	\$40.00	\$40.00	\$41.00	\$41.00	\$39.00	\$39.00	\$39.00	\$41.00	\$44.00	\$54.00
Land Investment	\$80.00	\$80.00	\$80.00	\$80.00	\$80.00	\$80.00	\$80.00	\$80.00	\$80.00	\$80.00	\$80.00
Total Costs/Acre*	\$367.34	\$334.33	\$355.04	\$325.11	\$321.40	\$320.28	\$341.16	\$346.39	\$270.54	\$305.33	\$499.11
Net ROI/Acre	\$193.66	\$141.67	\$171.96	\$139.29	\$143.00	\$255.72	\$198.84	\$193.61	\$111.96	\$317.11	\$270.89
Break-even Yield	43	39	46	25	25	11.12	12.64	12.83	32	10.30	91
Break-even Price	\$5.57	\$5.97	\$5.22	\$9.03	\$8.93	\$16.01	\$17.06	\$17.32	\$6.01	\$14.54	\$3.57

* Pricing data based on the average of elevators in the North Central North Dakota region as of 9/1/22.

* Expenses are estimates only and based on the average costs for the expenses listed in the North Central North Dakota region.

Contact your local seed agronomy advisor for your own customized version. Because of factors outside of Winfield United's control, results to be obtained, including but not limited to yields, financial performance, profits, losses or otherwise, cannot be predicted or guaranteed by Winfield Solutions.

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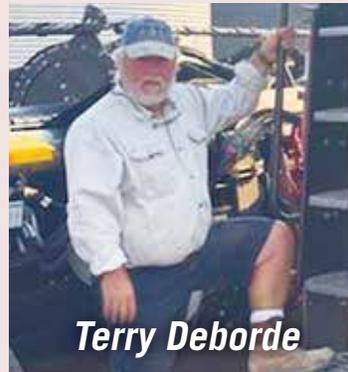
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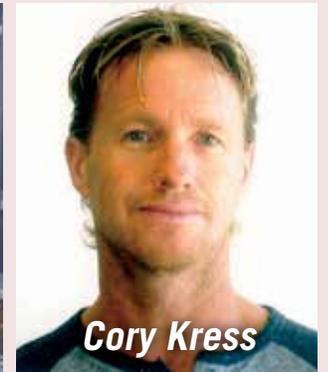
FARMERS TOUT THE BENEFITS OF INCLUDING WINTER CANOLA IN THEIR ROTATION

Mick Miller, CROPLAN® Winter Canola Product Manager
Twitter: @Mick_Miller32

We continue to see more and more producers adding winter canola into their crop rotations in the Pacific Northwest. Why? Because in addition to being a profitable crop on its own, the rotational benefits help set up subsequent crops for success. But don't just take my word for it. Who better to ask than two farmers who have reaped the rewards over the past few years? I recently sat down with Terry Deborde of Terry & Rhonda Deborde Farms in Fort Benton, MT and Cory Kress of Kress Ag in Rockland Valley, ID to chat about their experiences with the crop. Here's what they had to say.



Terry Deborde



Cory Kress

Q. How many acres do you seed to CROPLAN® winter canola, and what other crops do you grow on your farm?

Deborde: We've planted around 200 acres of CROPLAN CP320WRR winter canola for each of the past three years, but this is our seventh year with winter canola in the rotation. We also grow winter wheat, barley, flax, yellow peas, mustard, chickpeas and hemp seed for oil.

Kress: This our fourth year planting winter canola; we seeded 800 acres last fall split between CROPLAN CP225WRR and CP320WRR. Our other crops include winter and spring wheat, spring peas, oriental and brown mustard, safflower, flax, and occasionally spring canola.

Q. What seeding rate do you plant at, and how much nitrogen (N) do you apply?

Deborde: We seed at 6 lbs/A. Last year we put down 60 lbs. of 12-37-5-5 per acre in-furrow with the drill. Then we did a spring top-dress application of 80 lbs/A AMS and 120 lbs/A N. That was about 30 percent less than we usually apply; we cut back due to the really dry conditions and high N prices. We continue to fine-tune our fall N applications to find the right balance. Having adequate plant growth is important for winter survival, but you don't want it to grow too much or else the top node could be exposed to freezing temperatures.

Kress: We typically plant around 3.5 lbs/A depending on the conditions, and we usually apply 100 to 150 lbs/A N over the course of the season. About 20 percent of that goes into the mid rows with phosphorus (P) at planting, with the remaining bulk of it top-dressed in late fall or early spring

in an N and sulfur (S) liquid application. The soils in our area of southern Idaho are fairly calcareous, so I've found that the S treatment helps the P work more effectively.

Q. What are your average yields and how does it compare to spring canola?

Deborde: We yielded 40 bu/A last year. That was on the low side of our average, but we didn't get any rain after early June, and the crop was subjected to overly hot temperatures and strong winds. The year before that, we anticipated yields of 60 bu/A until a hailstorm hit the crop in the days leading up to harvest.

We don't grow spring canola often, because it usually yields only about half of what we get from winter canola. It's difficult to get a good spring canola crop in our area of north central Montana, because it flowers under tough summer conditions, and there are a lot of aborted pods. Winter canola, on the other hand, is typically done growing by the time we get that hot, dry weather.

Kress: Winter canola is by far our most profitable crop right now. We average 40 to 60 bu/A, which is typically twice as much as spring canola and three times as much as spring mustard. So obviously we prefer to grow winter canola, but spring canola is an option if we have a dry August and there isn't enough moisture to establish a good winter canola stand.

Q. Where does winter canola fit in your rotation?

Deborde: For the best results, we target a mid-August planting date for winter canola because there's usually



still enough moisture in the soil. Since our spring crop harvest schedule doesn't allow for that timing, we usually plant winter canola into summer fallow acres and follow up with a spring cereal grain before going back into winter wheat in the following fall.

Kress: We always try to avoid planting two grass crops in a row on our farm, so winter canola is great in a continuous rotation with winter wheat on our best producing fields. But we typically fallow our lower producing ground is every three years, so we'll usually start with winter wheat and follow it with safflower before fallowing. Then we'll plant winter canola followed by either a spring cereal crop or peas, and fallow it again.

Q. What kind of rotational benefits have you experienced after having winter canola on your fields?

Deborde: Our spring cereal crops have been really healthy when following winter canola. We planted barley this spring and have a nice strong stand with even growth. Our fields' ability to absorb water has also been much improved since introducing winter canola and its big taproot to the rotation. Five years ago we had a ½ acre area that was like a dry lakebed. Moisture wouldn't penetrate it and we often had to harvest it in standing water. But since planting winter canola there, you can barely see it anymore.

I also like that the stubble, which is about 12 to 14 inches tall, traps snow in the winter, which helps provide some extra moisture come spring. I manage that by rolling the field after the next spring crop emerges. That helps push rocks into the soil and reduce remaining stalks.

Kress: I find that our winter wheat yields are usually about 10 percent better when we plant it after an oil crop like winter canola. CROPLAN Roundup Ready® winter canola is the only herbicide-tolerant crop we grow on our farm, so the weed control we achieve is really valuable and herbicide-resistant weed populations haven't developed in our fields. In addition, including winter canola in our rotation helps break soil disease cycles and reduce insect pressure, and its taproot helps break up the hard soil pan. I've grown mustard for the past 10 years and it also helps in these regards, but whatever I can achieve with mustard, I can usually do twice as better with winter canola.

Q. Is there anything that farmers who are new to producing winter canola should be aware of?

Deborde: An issue we're having is that glyphosate-resistant weeds are becoming an issue on our farm, so we've needed to add labeled tank-mix partners with different modes of action and make sure we apply at the right timing.

Fortunately a good winter canola stand out-competes most weeds, so early season control can go a long way. But if you have thin stands, nuisances like kochia and wild oats can invade them. We've started removing more thatch from areas with random bare spots to help alleviate that problem.

Another thing to be aware of is federal crop insurance isn't available for winter canola in our area. You can have your crop appraised after it breaks dormancy in the spring and insure it as a spring crop, but that only protects it against hail – not winterkill.

Kress: My biggest piece of advice is to review your farm's crop protection history and be aware of what you've applied over the past five years. Canola is susceptible to several broadleaf herbicides that have a long residual, so lot of herbicides used on wheat have plant-back restrictions on canola. We like that the SU residue tolerance (SURT) of CROPLAN CP225WRR winter canola gives us some extra flexibility when controlling weeds in our wheat crop.

Another thing I'd encourage farmers to do is attend cropping conferences or local field days. In addition to hearing about the results of research trials and different crop management practices, it's a great opportunity to talk with other farmers and learn from their experiences with winter canola.

Q. What role will CROPLAN winter canola play in your farm's future?

Deborde: Winter canola has been a very profitable crop for us, so it'll stay in our rotation for the long haul. The time crunch between harvesting the spring cereal crop and meeting our ideal planting date is the only thing keeping us from increasing winter canola acreage on our farm, because we try to keep 80 to 90 percent of our acres in crop.

Kress: We're slowly introducing the crop to more acres to determine where it will work best. Our fields range between 5,000 and 6,100 feet in elevation, so our winter conditions can be extreme. In some seasons we could have temperatures of -25 degrees Fahrenheit and no snow, so winter survival is a concern. That said, I've been really impressed by the advancements in winter hardiness over the past decade. Twelve years ago I was unsuccessful in growing winter canola, but we've had much better results since bringing it back four years ago.

Terry Deborde's and Cory Kress's stories are provided as individual experiences with WinField United products and may not be a representation of actual results than can be guaranteed. Because of factors outside of WinField United's control such as weather, soil, planting and product application; individual results to be obtained, including but not limited to: financial performance, profits, losses and yields cannot be predicted or guaranteed by Winfield United.

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CUSTOMER TESTIMONIAL

**JACK PETERSON
MANAGER, KEN BARBER FARMS
ONIDA, SD**

How many acres do you seed to CROPLAN® sunflowers, and which markets do you primarily target? What other crops do you grow on your farm?

We typically plant around 2500 acres to sunflowers, although we seeded 3500 acres this year. About 90 percent of our crop consists of CROPLAN® CP455E, which is a popular choice here in Sully County. Depending on the season, we produce for either the birdseed market or high oleic oil for crushing.

In addition to managing the farm, I'm an agronomist at Barber Chemical. An advantage of being a dealer is that we get the opportunity to try new products on Ken's farm, enabling us to share our experience with our growers. This year we got to plant a small plot of the new CROPLAN CP4157E sunflower, which was a limited release in 2022.

Other than growing sunflowers, we produce four varieties of wheat seed for the CROPLAN brand: CROPLAN 7909 and 7050AX hard red winter wheat, and CROPLAN 3530 and 3099A hard red spring wheat. We also grow corn and soybeans.

When did you start using CROPLAN sunflower seed and how has it performed for you?

We started planting CROPLAN sunflowers in 2017 with CP455E and CP432E. CP455E has always provided us with excellent yields. Like all crops, we try to plant multiple varieties to have diversity on the farm and to try to find the next best thing. CP455E keeps coming in at the top.

What populations do you plant at and how much nitrogen (N) do you apply?

We plant 20,000 to 22,000 seeds/A depending on the field. Our typical N rate is 5 to 6 lbs. per hundredweight (cwt). We've averaged about 2500 lbs/A over the past few years, which equates to 125 to 150 lbs N. Depending on conditions, we either spread urea or apply UAN 28%.

What crop protection practices does your management plan consist of?

We've found that an in-furrow insecticide/fungicide



treatment helps improve stem health. We also make two foliar applications to support a healthier root system. The first includes an insecticide and fungicide in our herbicide tank mix, and the other is a fungicide/insecticide tank mix at flowering.

Do you have any advice for farmers who are new to growing sunflowers?

One thing I always encourage farmers to do is diversify in the varieties they're planting. There isn't one perfect type of sunflower. Every variety has some type of weakness that exposes it to risk under certain conditions, so it's good to put your eggs in different baskets.

Also, sunflowers are great at recovering any "lost" N that's moved further down in the soil profile thanks to their deep taproot, so planting them after corn is a good strategy. But on the other hand, they can be hard on the ground due to the fertility they consume. Plus, there isn't much residue leftover after harvest, which leads to reduced soil moisture. So, it's important to keep those factors in mind when rotating into your next crop.

Jack Peterson's story is provided as an individual's experience with WinField United products and may not be a representation of actual results than can be guaranteed. Because of factors outside of WinField United's control such as weather, soil, planting and product application; individual results to be obtained, including but not limited to: financial performance, profits, losses and yields cannot be predicted or guaranteed by Winfield United.

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