

START CLEAN. STAY CLEAN.

CALL IN THE PRE-ENFORCEMENTS

👉 **BREAK THE
WEED SEEDBANK**
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FIELD'S BUILDING BLOCK**
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FMC

An Agricultural
Sciences Company

THE
FIRST NAME
 AND
LAST WORD
 IN
WEED CONTROL.

INTRODUCING THE AI RATIO THAT DELIVERS BEST-IN-CLASS RESIDUAL CONTROL AND ROI.

Control the toughest weeds with unmatched residual control, especially on heavier soil types, with Authority® Edge herbicide from FMC. A proprietary combination of two effective modes of action — Group 14 sulfentrazone and Group 15 pyroxasulfone — delivers up to 14 **more** days of residual control of small-seeded broadleaf weeds and grasses, including Palmer amaranth and waterhemp. Research found Authority Edge herbicide demonstrated longer lasting weed control than the competition in field trials.*

Authority Edge herbicide is one of 40+ products eligible for the exclusive Agronomic Rewards, Performance Assurances and Product Financing with the FMC Freedom Pass program.

Visit your FMC retailer or [FMCAGUS.COM/AUTHORITYEDGE](https://www.fmcagrus.com/authorityedge) to learn more.

*Research from 2018 and 2019 development and university testing across many locations. For a list of such studies, please contact your FMC representative.



Always read and follow all label directions, precautions and restrictions for use. Some products may not be registered for sale or use in all states. Authority Edge herbicide may not be registered for sale or use in all states. Contact your local FMC retailer or representative for details and availability in your state. FMC, the FMC logo and Authority are trademarks of FMC Corporation or an affiliate. ©2019 FMC Corporation. All rights reserved. 19-FMC-2096 10/19

TIPS TO BREAK THE WEED SEEDBANK

Wet weather delayed or prevented planting and interfered with timely herbicide applications in 2019, resulting in many more weed escapes going to seed. Some of these weeds are prolific seed producers with resistance to multiple herbicides. High deposits to the weed seedbank in those fields will haunt growers for years to come if they aren't managed. A high soil seedbank delivers multiple weed flushes per season, overpowers treatments and increases chances for rapid failure of the next herbicide technology. To help preserve crop yields and manage driver weed species, deploy these strategies to break the weed seedbank.

1 START CLEAN AND STAY CLEAN

- » Start with a strong preemergent herbicide and follow 14–21 days later with an overlapping residual. Only use postemergent herbicide technologies to clean up escapes from residual treatments, not as primary weed removal agents.
- » Use full rates.
- » Implement a season-long weed management strategy.

2 SCOUT

- » Determine burndown herbicide or tillage effectiveness and adjust program to remove escapes prior to planting. Apply overlapping residual treatments to bare soil. If weeds are still emerging, adjust as necessary.
- » Know your driver weeds and their emergence patterns to select the most effective herbicides.
- » Make timely post applications when weeds are small.

3 DIVERSIFY MANAGEMENT STRATEGIES

- » Cultural: Increased seeding rates, narrow row spacings, crop rotation.
- » Mechanical: Deep tillage, windrow burning, seed destructors.
- » Biological: Cover crops, optimized management for three plus years to overcome weed seed viability.

4 USE MULTIPLE SITES OF ACTION

- » Deploy sequential residual herbicide programs utilizing multiple sites of action to achieve optimum weed control and crop yields while reducing the soil seedbank over time.
- » Rotate traits.
 - There are only four post weed control options available that are still somewhat effective.

5 MINIMIZE WEED SEED PRODUCTION

- » Practice zero tolerance for weed escapes even if it means hand removal.

6 MINIMIZE FIELD-TO-FIELD WEED SEED MOVEMENT

- » Clean equipment and harvest worst fields last, if possible.

PODCAST: HOW TO START CLEAN AND STAY CLEAN WITH EFFECTIVE WEED MANAGEMENT.

▶ LISTEN NOW.

DO THE MATH: WHAT DOES 95% CONTROL LOOK LIKE?

1 FEMALE WATERHEMP ESCAPE / 100 SQ. FT.

= 87,120,000 SEEDS / ACRE X 30% VIABILITY 2 YRS. AFTER SEED DROP = 26,136,000 PLANTS X 95% CONTROL =

1,306,800 ESCAPES / ACRE.



THE BUILDING BLOCK FOR CLEAN FIELDS & FUTURE PROSPERITY

Start clean, stay clean. It's an adage that has taken root with each growing season. But, as Mother Nature seems to throw an increasing number of curveballs, how do we adhere to this direction when the path to clean fields has become more complicated?

For grower Kaley Wilkerson of Montgomery City, Missouri, it all starts with the first rung of her weed control program: preemergent herbicides.

"It is the foundation of our weed control program. The hardest weed to kill is the one you let come out of the ground," Wilkerson states. "So, we are very diligent about using preemergents on our farm."

To Wilkerson, preemergents have simplified her weed control program. Operating a no-till operation, Wilkerson found she was making too many passes with the sprayer and spending too much on herbicides each season. Starting small, she tested her new approach on a few acres to great success and has now widely implemented this concept on her operation's other soybean fields.

It's a similar story for Mike Clemens, a grower from Wimbledon, North Dakota. Entering his fifth year with a preemergent herbicide as the basis of his weed control program, Clemens has not looked back. His strategy: a two-pass herbicide program with the first application following the planter once soybeans are planted and a second spray coming three to four weeks later. Part of his recipe for success includes utilizing a mix of tools like Authority® Elite herbicide, glyphosate and dicamba.

"The preemergent program we're using definitely sets us up for the year because, right away, we're coming out of the gate with our herbicide on the field, controlling weeds from day one. We're also not getting into a situation where weather gets in our way," Clemens says.

UP AND AT 'EM, RAIN OR SHINE

The start of the 2019 growing season was one for the books. Perpetual rainfall and saturated soil made it very difficult for growers to get into their fields to plant and implement their herbicide programs, both preemergence and postemergence. Wilkerson was one of many growers who encountered these hurdles. Faced with a potential uphill battle, she wasn't worried about weeds getting a head start, thanks to years of managing the weed seedbank with a diligent preemergent weed control program.

"Spring 2019 was wet, but we have been in control of our weed situation every year. We have so few weeds that go to seed in the first place. We didn't have much weed pressure in the spring," Wilkerson adds.

Part of wading through difficult springtime conditions is biding your time. Selecting a preemergent herbicide with a long residual can help bridge the gap between planting and canopy closure. With a wider window of opportunity, growers have flexibility during what usually is an unforgiving part of the season.

"That window is pretty wide. At that point, we're basically targeting our volunteer corn and maybe cleaning up weeds, if we have some, with glyphosate," Clemens says. "Then we have nice clean fields, and we're relaxing while everyone else is scrambling."

PLAYING THE LONG GAME

The long-term threat of weeds is more present than ever. A growing weed seedbank can be detrimental to an operation's profitability, from increased cases of resistance development and lost bushels to reduced land value. Wilkerson notes that preemergents lay the groundwork for future seasons and should be viewed not only

as an investment for your wallet but also your well-being.

"The amount of money, headaches and stress weeds can cause you is astronomical. I don't even know if there's a value that could be placed on a preemergent. It's something we never limit in our program," Wilkerson states.

"Many growers look at the initial cost of a preemergent application on their farm without looking at the bottom line of what it could save them down the road by not having to make multiple passes. Even if they don't want to jump in with both feet, just try it on a limited number of acres and keep good records of herbicide spend on other acres. They'd see the value of a preemergent at the end of a year."

"Then we have nice clean fields, and we're relaxing while everyone else is scrambling."



Mike Clemens, Wimbledon, ND grower



FINDING THE HERBICIDE THAT'S RIGHT FOR YOU

Today's tough weeds require a more thorough control plan than ever before. Outsmarting weeds requires taking account of resistant biotypes, regional concerns, weather and much more. The use of a preemergent herbicide is one proven way to lay the groundwork for a clean and successful season. The portfolio of Authority® brand herbicides, with a family of eight herbicides to choose from, offers you the ability to find a weed control solution that works for your fields.

The selection is made simple with this easy-to-use guide*:

BASIC & ACID SOILS

(Soils pH 4.0 - 8.5)

Products listed under this column may also be used on soils below pH 7.0.

ACID SOILS

(Soils below pH 7.0)

WATERHEMP & PALMER AMARANTH

Authority® Assist herbicide
 Authority® Edge herbicide
 Authority® Elite herbicide
 Authority® First DF herbicide
 Authority® Supreme herbicide

Authority First DF herbicide
 Authority® Maxx herbicide
 Authority® XL herbicide

MARESTAIL

Authority First DF herbicide
 Authority® MTZ DF herbicide

Authority First DF herbicide
 Authority XL herbicide

RAGWEED

Authority First DF herbicide

Authority First DF herbicide
 Authority XL herbicide

ANNUAL GRASSES

Authority Assist herbicide
 Authority Edge herbicide
 Authority Elite herbicide
 Anthem® MAXX herbicide
 Authority Supreme herbicide

Authority Assist herbicide
 Authority Edge herbicide
 Authority Elite herbicide
 Anthem MAXX herbicide
 Authority Supreme herbicide

*ALS-resistant biotypes exist. Always incorporate multiple modes of action for successful and sustainable weed control.



NEW IN 2020 Authority® Edge herbicide

The new standard for residual control and resistance management is part of the industry-leading Authority brand herbicide family. By combining the industry's best Group 14 and 15 herbicides in an optimized ratio, Authority® Edge herbicide provides superior in-season residual control of pigweed and other small-seeded broadleaf weeds with excellent grass control.

- » Built for growers with wide-ranging soil and field conditions from light soils to heavy, high organic matter soils.
- » An optimized ratio of the industry's best Group 14 and Group 15 herbicides with use rate flexibility to fit with other in-season residual programs.
- » Provides up to 14 days longer residual weed control than competitors' preemergent herbicides.

“Authority Edge herbicide consistently provided 95-100% control of Palmer amaranth and waterhemp in soybean research trials in 2019. As the effectiveness of other preemergence herbicide treatments fell off, Authority Edge herbicide continued taking out weed flushes 25–42 days after treatment resulting in top-tier yields.”**

*Brent Neuberger,
 Senior Technical Service Manager for FMC*



LONG-LASTING CONTROL YOU CAN SEE.

▶ WATCH NOW.

** Research from development and university testing across many locations. For a list of such studies, please contact your FMC representative. Authority Edge herbicide may not be available for sale or use in all states. Contact your local FMC retailer or representative for details and availability in your state.



HERBICIDE TANK-MIX PARTNERS YOUR ALLIES AGAINST UNRULY WEEDS

The one-size-fits-all approach can be attractive, especially when it comes to weed control. You buy it, spray it on every acre and repeat the same process for years to come. Easy, right? Well, the days of that weed management style are gone.

With cropping systems available that tout simplicity, the road to weed-free and resistance-free fields is easier said than done. Though these systems can play a valuable role in controlling unruly weeds, growers should consider tank mixing different herbicides to secure better control.

To Brandon Schrage, FMC technical service manager, the key benefit of tank mixing versus using an all-in-one product is flexibility. By being able to adjust rates, concentrations and products, a grower can craft a tailored strategy for a specific acre, soil type and weed species.

“Tank mixing allows you to select not just the proper modes of action but the better active ingredients with these modes of action. Remember: Not all Group 15 herbicides are equal, and neither are all Group 14s,” Schrage states. “Using different modes of action the right way gives us multiple tactics to control weeds in the same way that narrow rows or crop rotations do.”

GRASSES GAINING A FOOTHOLD

For many soybean growers, a tank mix of dicamba and glyphosate has become the easy button to cleanse their fields of weeds. But, researchers like Larry Steckel, professor of weed science and Extension weed specialist at the University of Tennessee, have found inconsistent control of barnyardgrass, jungle rice and prickly sida has become a recurring issue for these programs.

“We’re getting such poor control in the Xtend® crop system with grasses. Everyone is mixing glyphosate with dicamba. It’s putting more emphasis than ever on using residual herbicides that control grasses,” Steckel says.

“Just never letting weeds come up is the best way to attack them. Get out there with a pyroxasulfone product like Anthem® MAXX herbicide. All of those things are going to have to be used more than ever because we can’t count on getting good grass control.” - Larry Steckel

Paired with the record amount of prevent plant acres across the U.S. in 2019, the foothold of grasses in 2020 soybean fields could be even tougher.

“A lot of weeds went to seed. We’re going to have some major buildup of the weed seedbank in a lot of those fields,” Steckel says. “So, don’t be caught flat-footed just thinking you can run out there with Roundup® herbicide and dicamba a couple of times and get good weed control.”

STEPS TO TANK MIX YOUR WAY TO ZERO

1

**DO YOUR HERBICIDE
HOMEWORK.**

2

**FOLLOW THE
LABELS PRECISELY.**

3

**CHOOSE HERBICIDES
WITH A RESIDUAL.**

4

**SPLIT UP APPLICATIONS TO
BETTER CONTROL GRASSES.**



WEATHER OR NOT: CONTROLLING WEEDS DESPITE CHALLENGING CONDITIONS.

When weather challenges a planting season, confidence in weed control can dwindle. Growers who take a start clean, stay clean approach regain some of that confidence in a must-win year. Anthem[®] MAXX herbicide, a residual herbicide applied postemergence, can fit into existing weed management programs to keep weeds under control during the early, most critical periods of weed control.

Weed germination speed is driven by soil temperature and moisture. In excessively dry or wet conditions, weed emergence can be delayed. Also, many growers now say weed emergence timing is unpredictable for the most critical weed species they face. The use of a proven preemergence herbicide with residual control like Authority[®] brand herbicides provides a strong base for weed control as seeds germinate and begin growing. This “**Start Clean**” method remains extremely valuable, especially when this preemergent herbicide brand contains multiple, effective modes of action.

Even with a strong start, however, unpredictable weed emergence could allow for a flush of weeds when the residual control of a preemergence herbicide runs out.

Two enemy-number-one weeds, Palmer amaranth and waterhemp, share similar characteristics for emergence. Both start emerging in April and May and continue to be a threat throughout the season. One of the most successful ways to control these species, which often are glyphosate resistant, is to implement an overlapping residual herbicide strategy.

This is where “**Stay Clean**” comes into play. Overlapping describes the sequential application of residual herbicides to avoid gaps in weed control and control later weed flushes. This strategy provides weed control at a critical time

before crops have canopied and become fully established. It also provides a wider window for timely postemergence application when weeds are small and easier to control.

Anthem[®] MAXX herbicide is an excellent fit into an overlapping residual program and has a wide application window. Anthem MAXX herbicide provides residual weed control in-season and has a low use rate with dual modes of action. The advantages of this overlapping residual approach were compared exclusively against other early postemergence applications. (See chart.) The yield advantage was clear, offering an additional 6 bu/A in soybeans.

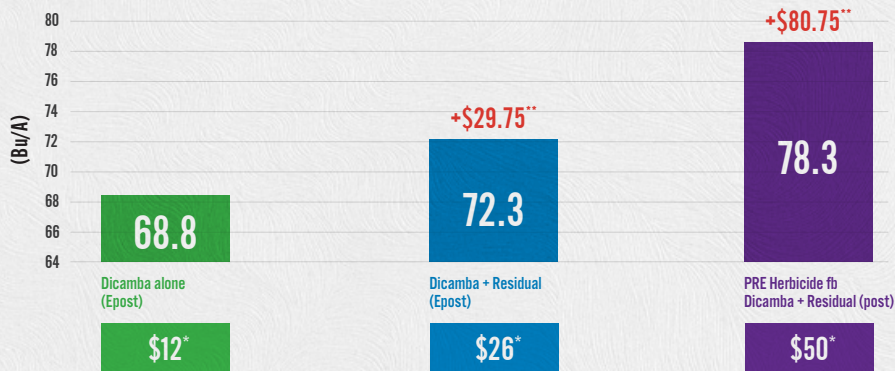
Anthem MAXX herbicide is also compatible with glyphosate, triazines, ALS-inhibiting products and liquid fertilizers. This compatibility and its dual modes of action make it an excellent way to curb resistance development in fields.

Growers who adopt a start clean, stay clean approach combine a preemergence herbicide application with a postemergence application of Anthem MAXX herbicide. This approach hinders weed emergence before crops have canopied and before they make some of their most critical developments.

TO LEARN MORE ABOUT ANTHEM MAXX HERBICIDE, VISIT FMCAGUS.COM/ANTHEMMAXX.

SOYBEAN YIELDS: IMPACT OF DIFFERENT APPLICATIONS IN ROUNDUP READY 2 XTEND[®] SOYBEANS

FMC Research-Nebraska, 2017



(# of treatments in yield average) Pre: 5/15; Epost: 5/31; Post: 6/20
 *Cost of herbicide treatment.
 **Return on investment per application compared to using dicamba alone.



PROGRAM DATES OCTOBER 1, 2019 - SEPTEMBER 30, 2020

MORE SUCCESSFUL SEASONS START WITH MORE FREEDOM IN THE FIELD.

**FMC REWARDS YOU FOR MAKING INDEPENDENT, INNOVATIVE
CROP PROTECTION DECISIONS THROUGHOUT YOUR SEASON.**

Only the FMC Freedom Pass program rewards you for choosing crop protection products not tied to a seed brand. 40+ FMC herbicides, insecticides and fungicides qualify for our exclusive agronomic and economic incentives.

- Season-long incentives that reward you for sound agronomic decisions from pre-plant to harvest.
- Performance Assurances that increase your confidence and protect your bottom line.
- A revolutionary crop protection application system and formulation technologies available only from FMC.
- Fixed 0% APR¹ that makes it easier for you to get what you need throughout the season, but pay after harvest.

Visit [FMCFreedomPass.com](https://www.FMCFreedomPass.com) to calculate potential financial incentives and learn more.



¹Offer valid on qualifying purchases made between October 1, 2019 to September 30, 2020. Offer limited to **Multi-Use Account** Agricultural customers with an available Special Terms limit. Subject to the Multi-Use Account credit agreement and approval. Fixed 0% APR from the date of purchase, which may be prior to delivery, until December 2020, when the entire transaction amount is due in full. Regular Multi-Use Account rates will apply after that date. Offer may be limited to qualifying products. \$10,000 minimum purchase required. Subject to merchant participation, see your local merchant for complete details. Multi-Use Accounts are a service of John Deere Financial, f.s.b.

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