



3RIVE 3D® Formulation & Application System

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Application & Innovations Platform Lead





Sunflower growers need alternatives

- Production limiting factors;
 - Increasing insect pressures from wireworms, white grubs, seedcorn maggots and flea beetles
 - Impact of soil-borne pathogens increases with insect penetration
 - Seed treatments, designed to protect the seed through germination, can be overwhelmed by pest pressures
 - Increasing external demand to reduce seed treatment use
 - But alternative management options may not provide sufficient crop protection
- What can we do?



WINNER

**Best Application Technology
Innovation**

Agrow Awards
Agribusiness Intelligence | informa

3RIVE 3D

FMC

Fill Once, Plant All Day



Precision Agriculture, Meet FMC

- Low volume liquid formulations include insecticides, fungicides and combinations.
- Use 90% less water than traditional liquids, and nearly half the weight of granules.
- Current labels include corn, soybeans, dry beans and peas with expansion plans into cotton, sunflowers, sugarbeets and more.
- Dust-free formulation reduces potential pollinator impact from dusting-off.
- No measuring or mixing, applicator does that work for you.
- Product doesn't mix until use, so rain delays don't require tank agitation.
- Fits most planter brands and models.
- Plant at any speed. The system won't slow you down.
- Change rates as crops and pest control needs change.
- Formulation and application systems are co-dependent.
- Application system installed on planter for at-plant application.





3RIVE 3D® converts traditional high volume applications to low volumes through patent-pending technologies

Self-contained 3RIVE 3D® application system

- 130 gallon water tank for clean water only
- 30 gallon concentrate tank for 3RIVE 3D formulations only
- System control components
 - Concentrate and solution pumps, precision flowmeter, air compressor, associated plumbing and wiring harness



Three-dimensional expanded solution



Concentrate + Water + Air

Patent pending 3RIVE 3D® Manifold combines water, chemical concentrate and air in precise ratios to expand the solution up to 50X and deliver to individual planter row units.



This planter weighs approximately 35,000 lbs. (empty, base model). The 3RIVE 3D applicator weighs less than 500 lbs. (empty), less than 2% of total planter weight



Real growers sharing real experiences



"There are obvious advantages to coming up with a new method of applying insecticides in order to get better coverage than you do by applying granulars. The 3RIVE 3D foam expands for excellent coverage in the planting zone."

- Dr. Billy Fuller, SDSU

"The reason we went with 3RIVE 3D was the ease of the whole system. It doesn't take a lot of room on the planter. I'm able to access my planter units...and the speed of fill...just two connections. No mess."

- Bill Voorhees, Maroa, IL

"I got tired of having to load the boxes all the time. When you have a 24-row planter, loading 24, 50-pound insecticide boxes is a lot of work. This system is way easier to use and I can cover more than 300 acres with one fill."

- Mike Case, Martinsville, IN

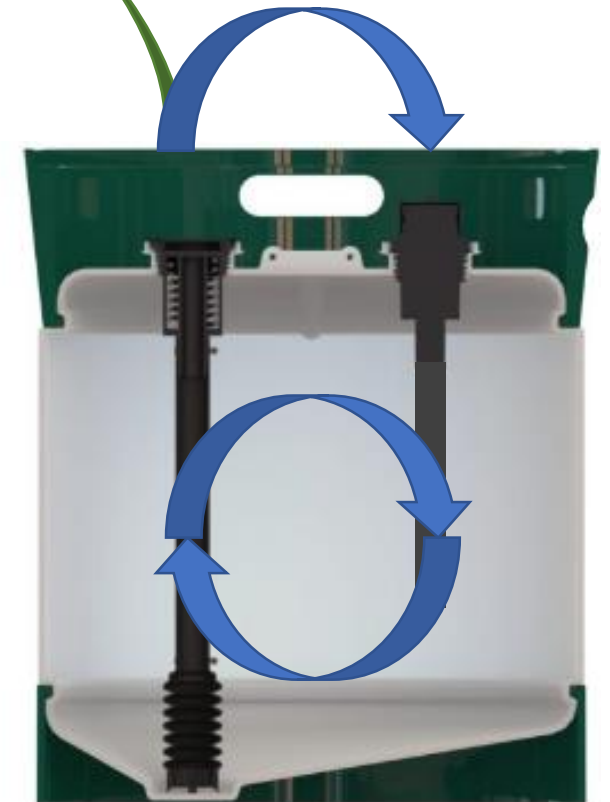


Convenient packaging and system fill

- 15-gallon returnable kegs
 - Two kegs fill the system
- Transfer pumps provided with application system
- Transfer pump and keg are configured to recirculate product prior to delivery to the application system
 - Recirculation takes less than a minute
- Closed transfer via quick-connect, dry-lock valves minimizes user exposure to product



Recirculate product in keg,
then pump into applicator tank





3RIVE 3D[®] formulated products exclusively for the 3RIVE 3D[®] application system



CAPTURE[®] 3RIVE 3D[®]

- Use rate: 4 - 8 fl. oz./A, depending on pest targets
 - 16 - 32 acres per gallon (up to 480 acres per system fill)
- Caution signal word
- For control of CRW & broad spectrum seedling pests in corn, soybeans, dry beans and peas
- Broad spectrum pest control protects seeds/seedlings before damage occurs



ETHOS[®] 3D[®] INSECTICIDE/FUNGICIDE

- Use rate: 4.6 - 9.1 fl. oz./A, depending on pest targets
 - 14 - 28 acres per gallon (up to 420 acres per system fill)
- Caution signal word
- For control of CRW & broad spectrum seedling pests in corn, soybeans, dry beans and peas
- Broad spectrum disease control, including pythium, phytophthora, rhizoctonia and fusarium

Increase plant stands, increase grain production, protect yield potential



Field testing to establish sunflower crop tolerances for FMC bifenthrin brands

- Thank you NSA for your inspiration and cooperation!
- 2016 & 2017 field trials completed
- Crop residue data completed
- EPA registration has been submitted
- Anticipated timeline; PRIA 16 months = February 2020
 - Capture[®] LFR[®] insecticide
 - Capture[®] 3RIVE 3D[®] insecticide
 - Ethos[®] XB insecticide/fungicide
 - Ethos[®] 3D insecticide/fungicide

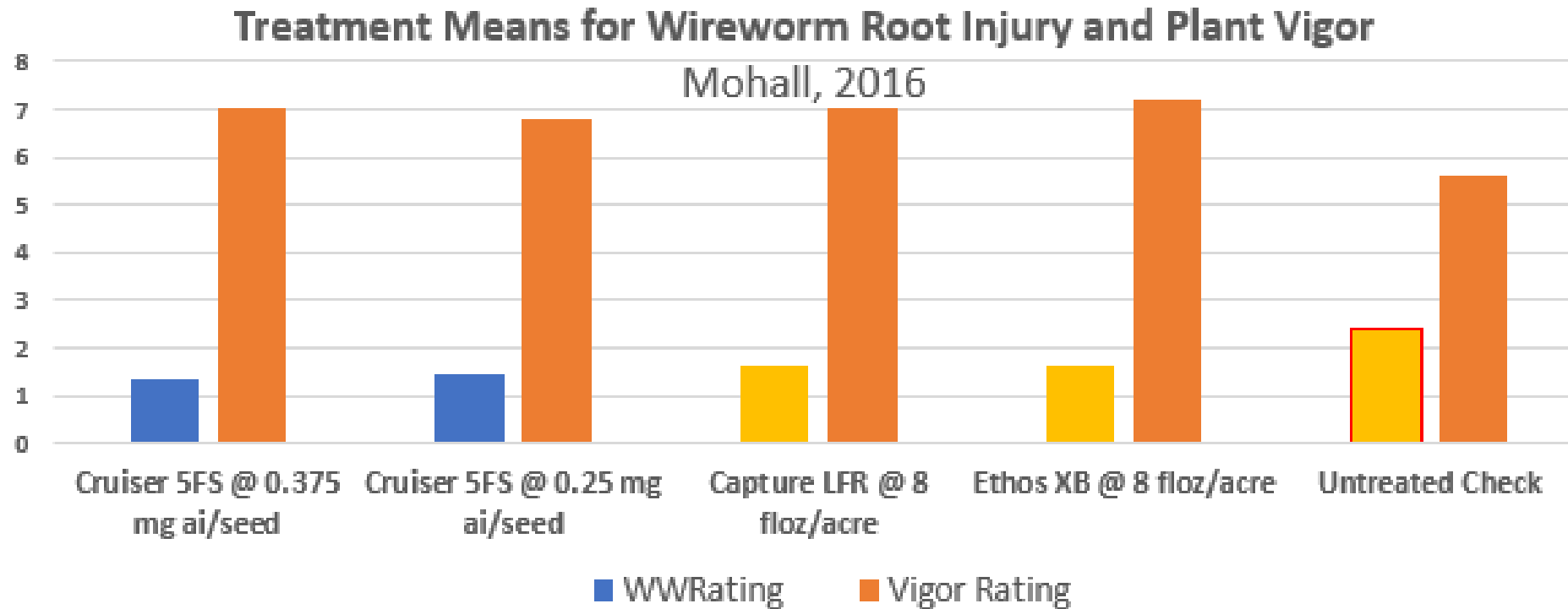


Capture[®] LFR[®] insecticide, Capture[®] 3RIVE 3D[®] insecticide, Ethos[®] XB insecticide/fungicide and Ethos[®] 3D insecticide/fungicide are Restricted Use Pesticides.



NDSU Sunflower Field Trials

- Data indicates significant plant vigor improvement compared to check
- Data indicates no statistical separation of wireworm injury ratings in the treatments

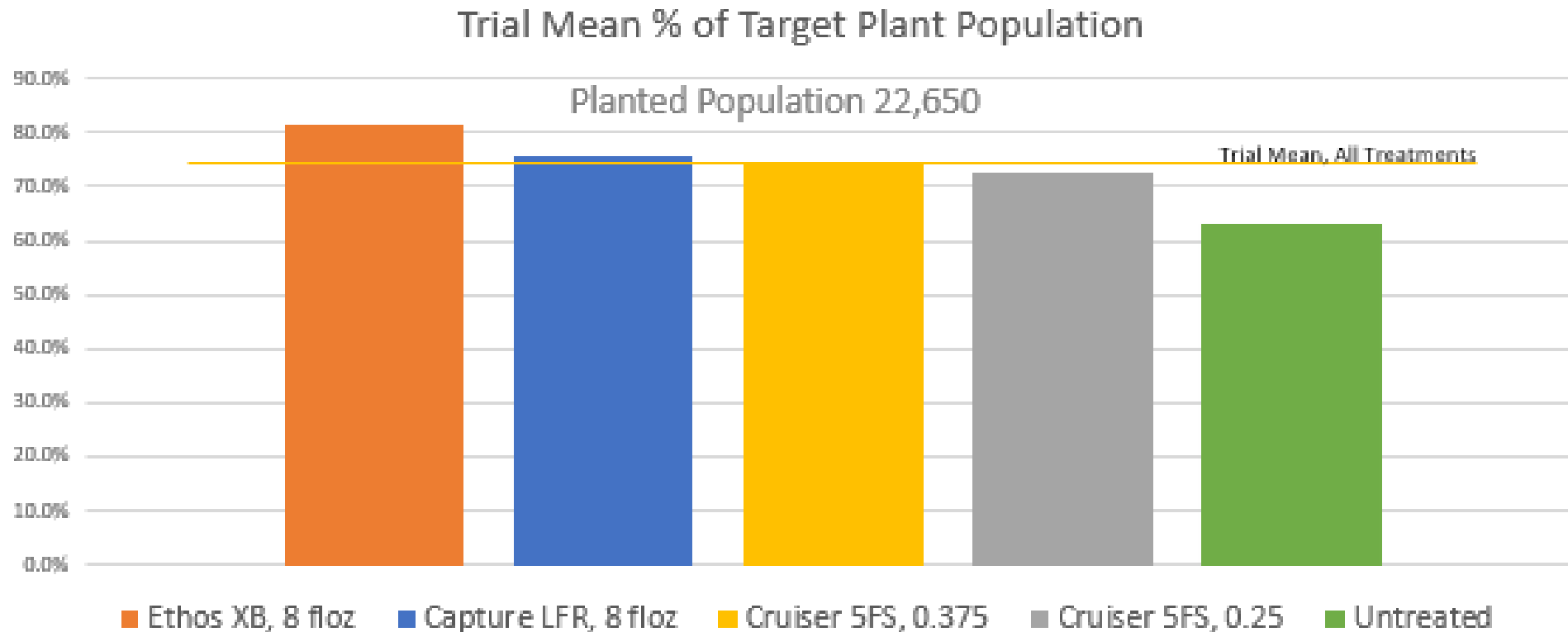


Wireworm rating; 0 - 9 rating scale; 0 = no injury, 9 = dead plant. Vigor rating: 0 - 9 rating scale, 9 = best



NDSU Sunflower Field Trials

- Data indicates LFR brands improve plant populations and improve final stand as compared to desired plant population
- Combination of insect and disease protection maximized plant population in this trial



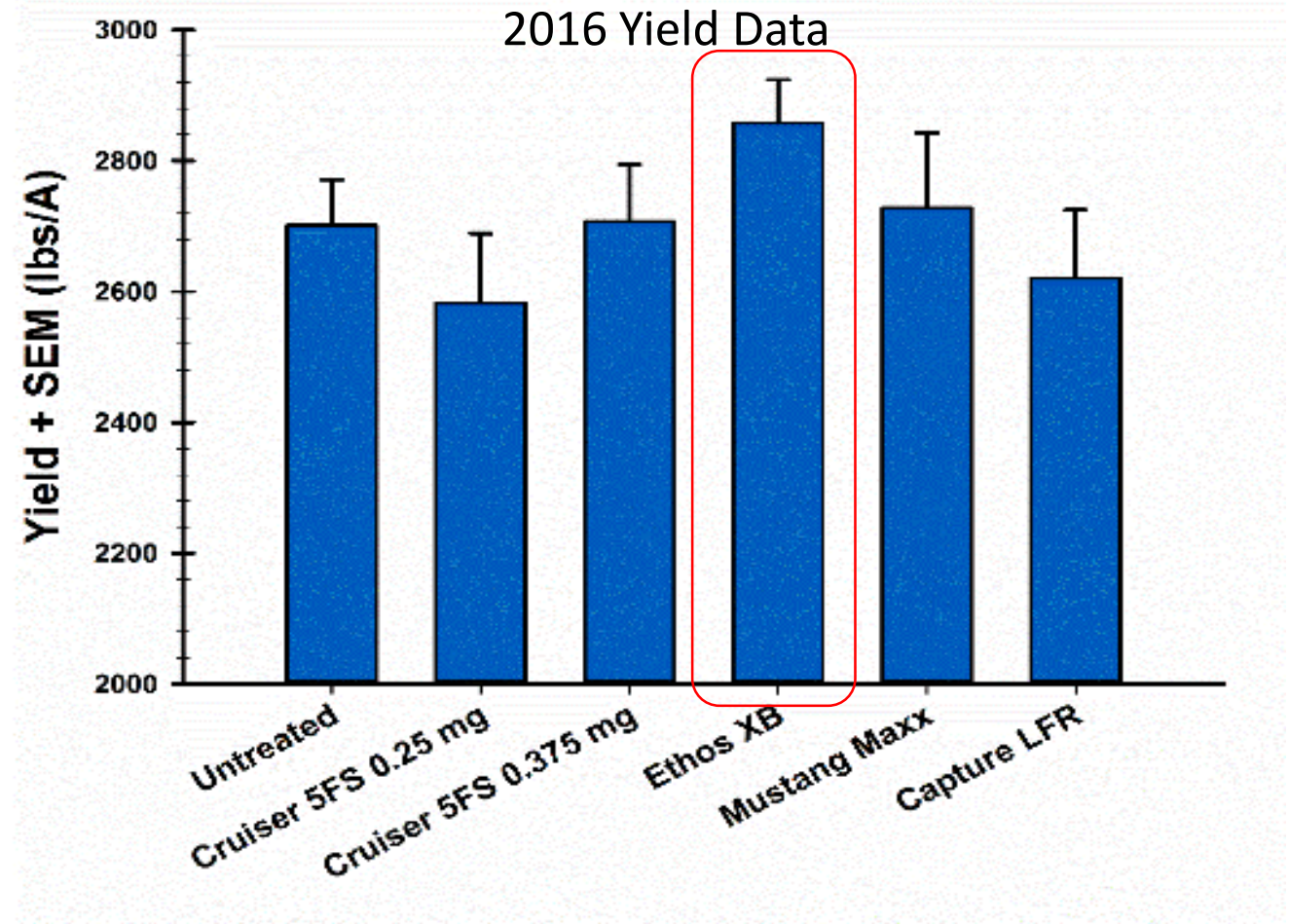


SDSU Sunflower Field Trials

- Data suggests benefits of both insect and disease protection from in-furrow application of Ethos XB provide growers a greater return on investment

Brady Hauswedell, P. Rozeboom, J. P. Michaud, J. Knodel
and A. J. Varenhorst

South Dakota State University, Kansas State University,
North Dakota State University

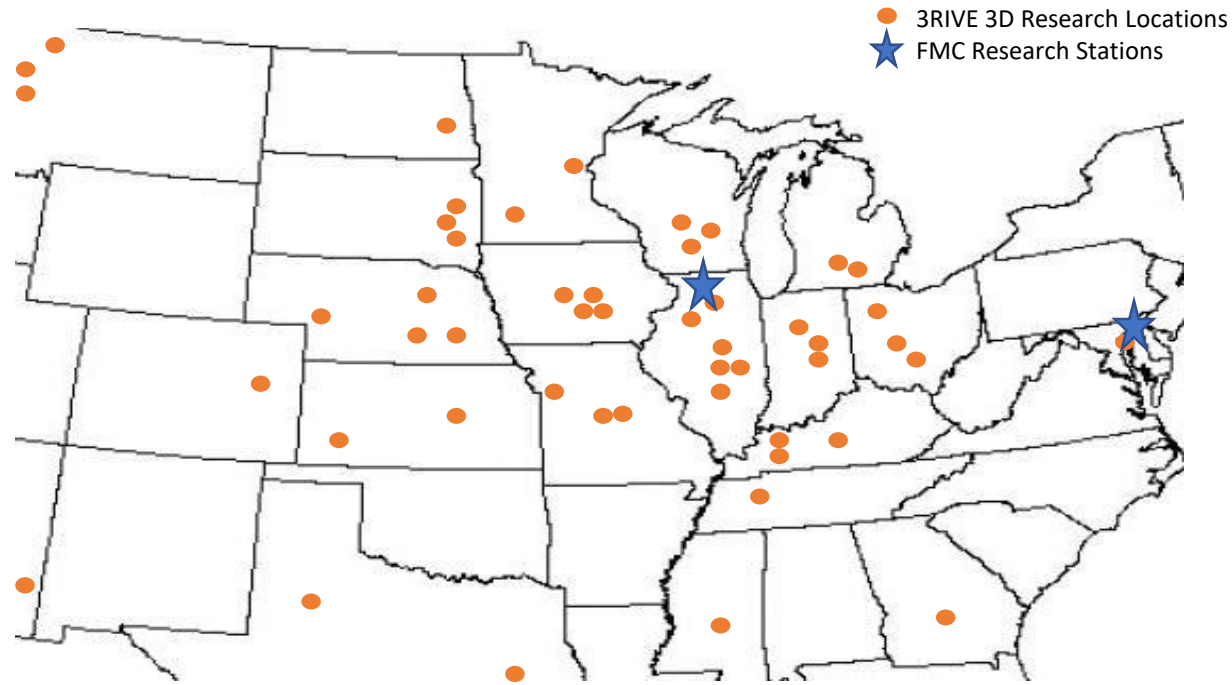


Capture® LFR® insecticide, Ethos® XB insecticide/fungicide and Mustang Maxx are Restricted Use Pesticides. Cruiser® is a trademark of Syngenta Group Company



Product development projects expand testing in new crops and with new products

- 50+ research applicators at Universities and industry researchers for USA trials



System testing in other FMC Regions including Australia, Brazil, Canada, France





Application technologies fit the way you farm



Protect your crop from a broad spectrum of insect pests

Combine powerful insect protection with broad spectrum, long lasting disease protection



No Liquid Starter Fertilizer Used

Liquid Starter Fertilizer 2X2

Liquid Starter Fertilizer In-Furrow



For more information on 3RIVE 3D® and all other FMC brands, visit fmccrop.com

Capture® 3RIVE 3D® insecticide, Capture® LFR® insecticide, Ethos® XB insecticide/fungicide, Ethos® 3D insecticide/fungicide and Mustang Maxx insecticide are Restricted Use Pesticides. Always read and follow all label directions, restrictions and precautions for use. Some products may not be registered for sale or use in all states. As of November 1, 2017, the USEPA registrations for Cyazypyr and Rynaxypyr actives were sold by DuPont to FMC. FMC, 3RIVE 3D, Brigadier, Capture, Cyazypyr, Ethos, LFR and Rynaxypyr are trademarks of FMC Corporation or an affiliate. ©2018 FMC Corporation. All rights reserved. 08/18