AgFax Weed Solutions

Arkansas Rice: Sedge-pocalypse – Identification and Management 6-24

Sedges have exploded across Arkansas in 2019 throughout different cropping systems. Additionally, Read More

Illinois Soybeans: Layering Soil-Residual Herbicides 6-21

Applying soil-residual herbicides with non-residual, foliar-applied herbicides can help reduce additional weed Read More

Tennessee: Where Do We Stand with Weeds? – Podcast 6-21

In this week’s podcast, Dr. Larry

Weed Management: What’s the Difference Between Herbicide Mode of Action and Site of Action?

BY GARED SHAFFER, SOUTH DAKOTA STATE UNIVERSITY

Steckel recaps highlights from the annual Read More

Georgia Peanuts: Post-Emergence Weed Control, Tank Mixing 6-20

We are in the 30-45 days after planting range for a lot Read More

Michigan: Weed Control Recommendations for Late, Prevented Planting 6-19

For field crop growers throughout the state it has been a late, Read More

Minnesota Weeds: Check Driftwatch/FieldCheck Before You Spray 6-19

To reduce the potential for pesticide drift injury to sensitive crops and Read More

Herbicides are chemicals that prevent or stop normal plant growth and development. These chemicals provide producers cost effective control of many weed species in crop, hay and pasture operations. However, improper application or over use of herbicides may result in crop injury, poor weed control, herbicide resistant weeds, environmental contamination, or health risks.

Mode of Action (MOA)

All herbicide interactions with the plant, from application to final effect, are considered the mode of action. The mode of action involves absorption into the plant, translocation or movement in the plant, metabolism of the herbicide, and the physiological plant response.

Site of Action (SOA)

Herbicide Site of Action is the specific process in plants that the herbicide disrupts to interfere with plant growth and development. The SOA is the most important aspect of herbicides when dealing with prevention and control of herbicide resistant weeds. The National Weed Science Society has numbered each group of herbicides under the same MOA and SOA for ease of reference when planning your herbicide program (Table 1).

Table 1. Herbicide Mode of Action and Site of Action.

Herbicide Mode Of Action	**(WSSA #) Herbicide Site Of Action**	**Product Examples**
Lipid Synthesis Inhibitors	**1-ACCase Inhibitors**	Poast, Select Max
Amino Acid	**2-ALS Inhibitors**	Ally, Everest, Pursuit

Herbicides: How Do Hot, Dry Conditions Affect Performance? 6-19

For the past several weeks, the Florida Panhandle has experienced hot and Read More

Illinois: Dicamba – Application Date Extended 6-17

The Illinois Department of Agriculture (IDOA) has announced it will extend the Read More

Minnesota: Weed Management Under Delayed Planting Conditions – Podcast 6-14

Our guest this week was Dr. Jeff Gunsolus, University of Minnesota Extension Read More

Synthesis Inhibitors		
	9-EPSP Synthase Inhibitor	Roundup, Touchdown
Growth Regulators	**4-T1R1 Auxin Receptors**	Clarity, Starane, 2,4D
	19-Auxin Transport Inhibitor	component of Status
Photosynthesis Inhibitors	**5-Photosystem II Inhibitors (different binding than 6 & 7)**	AAtrex, Metribuzin
	6-Photosystem II Inhibitors (different binding than 5 & 7)	Buctril
	7-Photosystem II Inhibitors (different binding than 5 & 6)	Direx
Nitrogen Metabolism Inhibitors	**10-Glutamine Synthetase Inhibitor**	Liberty, Cheetah
	12-Phytoene Desaturase Inhibitor	Sonar

Minnesota: Palmer Pigweed in Manure – What Can You Do? 6-14

The Minnesota Department of Agriculture has identified manure as a pathway of

Read More

Pigment Inhibitors	**13-DOXP Synthase Inhibitor**	Command
	27-HPPD Inhibitors	Callisto, Laudis
Cell Membrane Disruptors	**14-PPO Inhibitors**	Aim, Valor, Sharpen
	22-Photosystem I Electron Diverter	Gramoxone SL
Seedling Root Growth Inhibitors	**3-Microtubule Inhibitors**	Prowl H20, Treflan
Seedling Shoot Growth Inhibitors	**8-Lipid Synthesis Inhibitor (Not ACCase)**	Bolero, Far-Go
	15-Long-Chain Fatty Acid Inhibitors	Harness, Duel Magnum, Zidua
	16-Specific Site Unknown	Norton
Undefined	**17-Nucleic Acid Inhibitor**	MSMA

Herbicide Resistance Info

- **Waterhemp Scores Again – Resistance Found to Yet Another Herbicide Group – DTN**
- **Resistant Pigweed Seed – 3 Top-Rated Ways To Slash The Volume**
- **Reducing Pigweed Numbers With Windrow Burning – Basic “Blueprints” Here**
- **Weed Resistance Management – 6 Ways Your 2017 Planning Starts Now**
- **Herbicide Resistance – Prevention Starts In The Tank**

Resistance Management

As you can see from the table, there are 10 modes of action but only 8 of those are widely used, which in turn limits the available sites of action. There are over 700 registered herbicide products in South Dakota. Those products use 8 modes of action with 18 sites of action. Weed species that are resistant to three different sites of action: (SOA 1) ACCase, (SOA 2) ALS Inhibitors, and (SOA 9) EPSP Synthase Inhibitor (**International Survey of Herbicide Resistant Weeds**), are present in South Dakota.

More cases of resistance could be present, but not yet documented. To slow weed resistance, make sure to rotate herbicide sites of action within different modes of action as much as possible. If you have suspected resistance on your land, please contact SDSU Extension so the proper measures can be taken.

TAGS HERBICIDE APPLICATIONS HERBICIDE RESISTANCE HERBICIDES MODES OF ACTION SITES OF ACTION SOUTH DAKOTA WEED MANAGEMENT

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