

## Strategies For Weed Management Using A No-Till System

### *Avoiding Tillage for Increased Soil Health*

*By Kara Pugsley for the SD Soil Health Coalition*

No-till techniques – such as crop rotation and applying herbicides with multiple modes of action are two methods for killing weeds which do not destroy the structure of the soil the way tillage does. Tillage of weeds creates dramatic disturbances to the soil, which decreases water infiltration capacity and increases the likelihood of erosion.

#### *No-Till: Less Labor Inputs Plus A Healthier Soil*

“Well established no-till typically requires less agronomic and labor inputs, with comparable or higher yields to conventional tillage,” says Sara Bauder, SDSU Extension Agronomy Field Specialist. “When we have a healthier soil and good crop rotation system, many of our pest issues are suppressed or eliminated, allowing less dependence on chemical weed suppression.”

Bauder says no till has many benefits to the producer including monetary savings over time. “When combined with other conservation efforts, such as keeping the soil covered, maintaining plant diversity, keeping a living root in the soil, and even integrating livestock, an overall healthier soil can be created.”

#### *Crop Rotation As a Major Defensive Tactic*

Crop rotation is one of the best ways to throw pests for a loop, especially when using both warm and cool season crops and switching between grass and broadleaf plants, explains Bauder. She uses the illustration of changing from soybeans to winter wheat. “That way, we have a plant growing at a time when the previous crop was not growing, which will keep many of same weeds from growing each year due to competition with the cash crop at different times.”



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**Tillage of weeds creates dramatic disturbances to the soil, which decreases water infiltration capacity and increases the likelihood of erosion. (No-Till Wheat and Cover Crop, Pierre, SD)**

**Photo Credit: USDA-NRCS South Dakota**

Switching from a broadleaf to a grass is another weed-suppression technique. “For example, taking that same illustration of changing soybeans to wheat – we are changing the host plant for many diseases that can’t persist on both crops,” says Bauder.

“This helps prevent pathogens from finding a host crop and being a problem year after year.



**Bauder says although producers may find it tempting just to till the soil for weed control, tillage will likely cause more harm to the soil than good.**

**“When talking about weed control specifically, tillage can actually move weed seeds around and although it may take down standing weeds, it can help weed seeds that are already present in the soil to germinate,” she said. “Tillage destroys soil structure, slows biological activity, leaves the soil bare and open to erosion.”**

**Photo Credit: USDA-NRCS South Dakota**

Lastly, insects typically have certain host plants they prefer; by rotating crops and keeping a long rotation we can reduce the number of repeat insect infestations. So, the longer the rotation, the more chance we have of reducing pest pressure.”

Bauder explains that producers need to keep in mind that mimicking nature is one of the best strategies for pest suppression. “In nature, we don’t see the same annual plants growing year after year in the same place - it’s always a mixture or a well-established perennial crop.”f

Dan Forgey, farm manager at Cronin Farms near Pierre, SD, says crop rotation adds so much value to an operation. At Cronin Farms, they practice 100% no-till farming on their cow/calf operation. “We do a lot of cover crops and graze the cover crops,” said Forgey. “There is so much value in a diversified crop rotation – like 8 or 9 crop rotations, which makes it so we don’t have to use as many chemicals.”

### *Choosing Wisely with Herbicides and Sites of Action*

SDSU Extension Weeds Field Specialist Gared Shaffer says there are plenty of chemical options to use to control any of the upcoming weed issues South Dakota producers are going to be seeing. “Tillage doesn’t need to be in the forefront of anyone’s mind,” says Shaffer.

Shaffer says the top five weeds that producers should be on the lookout for this year include: kochia, waterhemp, marestail, palmer amaranth and common ragweed. “The worst weeds to deal with are kochia and waterhemp by far, with marestail being a close third,” Shaffer says.

Shaffer says each producer should evaluate their weed issues this year and use wisdom in choosing herbicides. “Don’t use the same ones with the same sites of action all of the time - the best thing to remember is that tank mixing of multiple sites of action is always a beneficial management decision.”

When referring to sites of action, Shaffer means specific location in or on the plant where the herbicide is attacking or the chemical process in the plant that is being overwhelmed in order to kill it.

Extension Agronomy Field Specialist Sara Bauder also notes that multiple sites of actions in herbicides means using different chemical formulations throughout the growing season or from one season to another. “This is so that chemical resistance to the particular ‘site of action’ does not develop,” she explains.

Kochia weed, buckweed and palmer amaranth are the biggest weeds Forgey is concerned about. “We have been able to cut back on our chemical use just with our crop rotations,” he explained. “Rotation keeps our soil pretty clean. The focus on our farm is soil health. The healthier the soil, the healthier the food. Based on that, sometimes we don’t have to use chemicals.”



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**Photo Credit: SD Soil Health Coalition**

### *No-Till Options Especially Important to Consider This Year*

Bauder says although producers may find it tempting just to till the soil for weed control, tillage will likely cause more harm to the soil than good. “When talking about weed control specifically, tillage can actually move weed seeds around and although it may take down standing weeds, it can help weed seeds that are already present in the soil to germinate,” she said. “Tillage destroys soil structure, slows biological activity, leaves the soil bare and open to erosion.”

Producers may end up spraying a total of three times during the entire season for weeds, although Bauder and Shaffer both agree that's up to the discretion of the producer as to what their needs are this year.

“Some producers may spray herbicide 3 times, and some may only apply only 1 or 2 times – with organic producers not spraying synthetic chemicals at all,” says Bauder. “It’s quite common to use a pre-emergence herbicide followed by post emergence herbicide application(s) during the growing season.”



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**(No-Till Soybeans, Cronin Farm, 2016 Leopold Conservation Award Winner)**

**Photo Credit: USDA-NRCS South Dakota**

Most of the issues with pre-emergent products not working are due to: lack of application in the spring due to weather or lack of moisture in dryer areas.

Bauder says delayed planting is a localized issue for South Dakota farmers this year:

“In some areas, where water is still standing some farmers may not get a crop planted this year or could be waiting up to a month later than they typically plant. In other areas where water has receded, and the wind and sun are starting to help dry out soils, they may only be slightly delayed or not at all. But that depends on how much more precipitation occurs.”

Both Shaffer and Bauder want producers to know that no-till has numerous benefits over tillage especially when it comes to weed management.

It is up to each producer to keep a living root in the soil, have a diverse crop rotation and work with their local agronomist or Natural Resources Conservation Service in your local USDA Service Center to choose herbicides wisely. Farmers considering tweaking their rotations or transitioning to a no-till system can get free, one-on-one on-site advice through their local NRCS office. For more information, visit [www.sdsoilhealthcoalition.org](http://www.sdsoilhealthcoalition.org) or call (605) 280-4190.