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FIELD WORK

How-To for Farmers

by Margaret Wilson

A rear-mounted flexible tine weeder targets shallow-rooted weeds.

Flying Blind

‘Blind’ Cultivation a Promising Method for Weed Management on Organic Farms

For as long as there have been farms, there have been weeds. For row crops, “blind” cultivation practices are some of the best mechanical weed management methods. Blind cultivation refers to cultivating the field without regard to the placement of the field rows, allowing the mechanical design of a rear-mounted flexible tine weeder to target shallow-rooted weeds.

When pulled along a field, the flexible tines move over the soil, disturbing the top layer and uprooting shallow weeds that have just begun to emerge. But blind cultivation isn’t an exact science.

“Success is determined by the skill of observation and the agility to make the right decisions at the right time,” say Klaas and Mary-Howell Martens, owners of Lakeview Organic Grain, in a 2005 article for New Farm. “Having the right equipment and the skills to make the right adjustments can help make the difference between success and a weedy field.”

At Rodale Institute in Kutztown, Pennsylvania, a fundamental research goal is helping organic farmers identify the best methods of weed management. The Institute currently utilizes a precision spring-loaded tine weeder manufactured by Treffler, based in Germany.

On this model, tension on the tines can be adjusted hydraulically, allowing the tine weeder to be used on tender young seedlings without injuring them. The tension is gradually increased as crops grow bigger and more resilient to disturbance. This flexibility substantially increases the window of opportunity to control weeds, ranging from when they are almost invisible to long after emergence.

At Rodale Institute, three to five passes with the tine weeder are typically utilized, with the first pass completed before crop emergence. Subsequent passes are completed once crops are 3-4 inches tall, and stop when the crops are about 12 inches tall.

“It is best to have as few field passes as possible, but it is hard to get a good balance between the number of passes and weed control—so we do it as many times as we can still find weeds just beginning to emerge,” says Dr. Emmanuel Omondi, Director of the Farming Systems Trial, Rodale Institute’s 40-year-old comparison study of organic and conventional grain cropping systems.

For organic row crop farmers, blind cultivation may be the answer to getting a head start on weeds. Here’s what you need to know about getting started:

PLANTING DEPTH: Most tine weeders are designed to penetrate soil to a depth at which many crops are commonly planted, ranging between 1 and 2.6 inches depending on crop species. Tine weeding is generally not recommended for shallowly planted crops, such as industrial hemp, that are typically planted at 0.5 inches deep.

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SUITABILITY: While larger-seeded crops like corn and soybean are best suited to blind cultivation, tine weeding is just as effective on almost all row crops and some vegetables. Blind cultivation is effective on broad-leafed weed seedlings like common lambsquarters, but not suitable for the control of annual or perennial weeds with extensive root systems. Therefore, blind cultivation should be coupled with other more aggressive cultivators, such as S-tine weeder, to effectively address a more diverse weed set if your farm has a larger weed base.

EQUIPMENT: Several different types of equipment can perform blind cultivation, including tine weeders or rotary hoes. Tine weeders, otherwise known as flexible harrows, are the most common tools for blind cultivation. Tine weeders vary in size and shape, from straight tines, forty-five-degree bent tines, or eighty-five-degree bent tines. The choice of weeder depends on your soil, with a straight tine weeder operating best in loose soft soil, while bent tine weeders are more suited to dry and compacted fields.

Blind cultivation can also be completed using a rotary hoe, which is best used when more aggressive machines would risk crop damage. However, stony soils can damage the hoe points.

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TIMING: Blind cultivation needs to occur in a small window of time. "This window starts [on] the day you can see the white hair roots [of the weeds] when you scratch the soil surface," say the Martenses. You may also see a "light reddish-green haze over the soil. Sometimes you can just see tiny weeds growing in soil cracks." The first pass of blind cultivation will be most effective when row crops have not yet emerged, and the weather is hot and dry.

ADDITIONAL PASSES: A second or subsequent pass with a tine weeder or other machine should be done once the crops are well-rooted, with 3 or 4 leaves, but before the crop starts jointing or the weeds are too big to be uprooted by the weeder. Once the crops are well-established, the weeder can be adjusted to a more aggressive setting that will target more established weeds.

Weeds may be an ever-present concern for organic farmers, but with a little strategy and some blind cultivation, the job will be much easier down the line. **NF**

Learn from the experts at Rodale Institute why blind cultivation may be the answer to getting ahead of weeds on your farm. Follow Rodale Institute's research at RodaleInstitute.org.

The tine weeder scratches the surface.