

FIELD
TESTED



Maximizing Efficient In-Row Cultivation



Field Tested is a series of reports about farm tools that have been tested by Montana farmers to enhance their specialty crop production. The reports describe these farmers' findings to help others make informed decisions about their specialty crop businesses. Visit FarmLinkMontana.org/fieldtested to read more Field Tested reports. This project is administered by the Community Food & Agriculture Coalition with funding from the Montana Department of Agriculture Specialty Crop Block Grant Program.

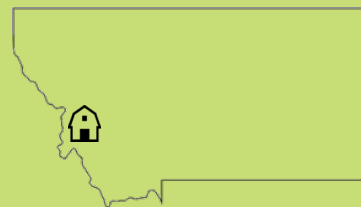
MILL CRICK FARM | HAMILTON



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Mill Crick Farm Snapshot

Location: Hamilton, MT
Operator: Randall Mark
Acres: 12 in specialty crops
Crops: Mixed Vegetables,
Flowers, Bedding Plants



INTRODUCTION

Managing and controlling weeds is a challenge for farmers, regardless of the scale of the operation or the type of crop being grown. Efficient and effective mechanical cultivation that targets weeds within the planting bed can minimize the need for hand weeding, saving precious time and money. At Mill Crick Farm in Hamilton, owner Randi Mark used his Field Tested grant to purchase a combination of finger weeders and cultivation spyders to use with his Allis Chalmers cultivating tractor. The system targets weeds between planting rows and also at the edge of the bed. By cultivating both areas at once, Randi can reduce his weeds by up to 90% in just one pass.



Mill Crick Farm Stand

MILL CRICK FARM

Randi Mark purchased Mill Crick Farm in 2012 and has been growing ever since. Originally 10-acres, Mill Crick is now a 78 acre joint-venture on two sites north of Hamilton and west of Corvallis. Randi joined forces with Fourth Wave Farm (formerly of Stevensville) in 2017 to increase their space and open up new opportunities. Out of their total 78 acres, Mill Crick grows specialty crops on 12 acres.

The original homestead property has a greenhouse and 7500 square feet in high tunnels. The expanded acreage in the middle of the valley is flat, well drained, and perfect for growing field crops. Randi has a diverse market for his produce, selling the majority through Quality Foods Distributing, his farm stand, and the O'Hara Farmers Market in Hamilton.



The hoop house next to the farm stand protects early-season nursery plants



A view over the Mill Crick Farm property near Teller Wildlife Refuge.

IMPLEMENTS FOR IN-BED CULTIVATION

Cultivating close to your crops is a dynamic process. Generally, the first step in using new tools effectively is the set-up and calibration of the tool for your specific conditions. Adjustments can vary widely depending on your model of tractor and where the tools are mounted, the crop variety, plant spacing, weed pressure, soil type, and climate. While manufacturers suggest optimal ways to use their tools, actual implementation will vary by farm, and knowing the best combination of tools for your

PROJECT SUPPLIES

- Tilmor finger weeders (6)
- Tilmor cultivation spidders (3)
- Tool Bar
- Mod Bar
- Clamps

Tilmor Finger Weeders

Finger weeders are semi-soft polyurethane star-shaped disks, where the “fingers” rotate next to the plant stem within the planting bed. Weeds should be just emerging or in the cotyledon phase for best results, but Randi has found that as long as his crop is still higher than the weeds, the finger weeders can effectively remove weeds in two ways. First, you can angle the fingers slightly backward, resulting in weeds being uprooted and “flicked” out of the soil. Second, if you pitch the fingers slightly forward, they will hill soil into the row and bury short weeds.

Finger weeders are most effective on transplanted crops and are designed for use with hardy-stemmed brassicas. However, Randi has found that they can also be effective with direct-seeded delicate crops, as long as the plants are well rooted and larger than the weeds. To provide flexibility, Tilmor manufactures finger weeders in two levels of hardness, targeting different soil and crop types. Randi uses the medium-level finger weeders because they are ultimately more versatile in the types of crops he cultivates.

Finger Weeder Hardness	
Medium	Hard
Soil type: Sandy, delicate soils	Soil type: Heavier, clay soils
Crop type: Suitable for almost all crops when planted in rows with sufficient space in between. Transplanted broccoli, cabbage, cauliflower, lettuce, kale, eggplant, tomatoes, onions. Direct seeded corn, beans, squash, beets, radishes	Crop type: Well-rooted, hardy crops. Transplanted broccoli, cabbage, cauliflower, lettuce. Direct seeded corn, beans, squash (if timed correctly with weed germination)
Optimum weed stage: cotyledon to 2-leaf Optimum crop stage: well properly rooted	Optimum weed stage: cotyledon to 2-leaf Optimum crop stage: well properly rooted

Finger Weeder Tips
<ul style="list-style-type: none"> • Increase distance between fingers to reduce aggressiveness • Run at low speeds in dry to slightly moist soil • Run an implement such as sweeps, disks, or spyderys ahead of fingers to loosen soil • Cultivating too early can uproot plants



Component parts of the finger weeder



Mill Crick Farm's Allis-Chalmers Cultivating Tractor



Cultivating spyderys

Tilmor Cultivation Spydery

Cultivation spydery are used to break-up heavy soils and loosen weeds close to the crop row. They can be positioned straight down the row, or at angles toward or away from the row to get desired results. They are intended to replace disk hillers, and ensure that soil is aerated with no smooth shoulder.

If angled away from the row, they fracture the soil and move weeds towards the outside edge of the bed. If angled inward, they aerate the soil and move soil inward to hill soil against the base of crops to help promote root growth. When angled straight down the row, they can be operated at higher speeds to target small strips for quick cultivation.

At Mill Creek Farm, they are used in tandem with the sweeps (which come before) and the fin-



The spyder, belly-mounted to Randi's Allis Chalmers tractor. Note 1.5" tool bar and tool clamps.

VISUALIZING MILL CRICK'S SYSTEM



A field of brassicas at Mill Crick Farm exhibiting the cultivation outcomes

LESSONS LEARNED

Other tools to use with Fingers and Spydors

Regardless of whether you're using the fingers, spydors, or the two in combination, Randi found that it is best to first pair them with an implement that first loosens the soil. He uses his existing field sweeps first, which point forward, slicing through the top soil layer and loosening the soil and weeds.

Randi also incorporates use of his flame weeder into his cultivation routine. When using finger weeders, it's important that the crop is taller than the weeds and has more established roots. When direct seeding crops, using a flame weeder just before crop emergence knocks back weeds at just the right time to give the vegetables the start they need to be prepared for in-bed cultivation.

Doing more with the extended tool-bar

The original version of the tool-bar sold for finger weeders only allows enough space to cultivate a bed with two rows of crops. There is a 12-inch extension available and Randi recommends having this from the start. This extension would allow him to cultivate three rows at a time, which would provide more flexibility for his farm, whether needing to cultivate two or three row beds.

Other considerations

Changing and adapting these tools takes considerable time and effort, and operators won't always want to use them in tandem. Luckily, Randi has two cultivating tractors that can both be used in this process, where the first pass is with the field sweeps on one tractor, followed by the tools purchased through Field Tested with the second tractor.

ADDITIONAL RESOURCES

Montana Department of Agriculture Specialty Crop Block Mini-Grants: The purpose of this program is solely to enhance the competitiveness of specialty crops in Montana. Visit their website to find funding opportunities and more information: agr.mt.gov/SpecialtyCropBlockGrants

Tilmore Online Store: Learn more about Randi's implements and other tools provided by Tilmore: tilmore.com

Video—Michigan State University reviews Finger Weeders and lends tips, tricks, and other implementation considerations after research: <https://www.youtube.com/watch?v=4rQQ7iNk2-o>