FIELD TESTED

Paper Pot Transplant System

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 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.

PRAIRIE HERITAGE FARM | POWER

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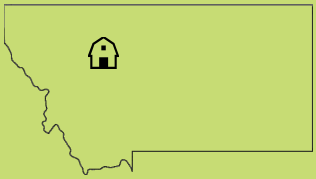
Prairie Heritage Farm Snapshot

Location: Power, MT

Operator: Jacob & Courtney Cowgill

Acres: 30 acres

Crops: Landrace Grains, Vegetables, Seed, Bread



INTRODUCTION

In January 2017, Jacob Cowgill purchased the paper pot transplant system for Prairie Heritage Farm. The tool, which unfurls a 'string' of plants to quickly transplant in the field, promised to reduce transplanting time, straighten rows in the field and increase the number of successions that could be grown in the short season on the Rocky Mountain Front in Power, Montana. Jacob hopes that this report will aid other specialty crop growers in their decision to invest in this tool system by providing firsthand experiences with the tool and data from its use at Prairie Heritage Farm.

PRAIRIE HERITAGE FARM

Prairie Heritage Farm is owned and operated by Jacob and Courtney Cowgill, both born and raised in north-central Montana. They left as young adults for school and careers but came back in 2009 to start the farm. Wanting to find a way to make a life in central Montana and to give back to the

communities that raised them, they started farming on leased ground near Conrad in 2009. In 2012, they purchased ground near Power on the Fairfield Bench and have been farming there since, with Great Falls as their primary market.

Lettuce planted by paper pot at Prairie Heritage

Certified Organic enterprises on the farm include fresh vegetables, vegetable seed, and unique and specialty grains. They grow fresh vegetables for a CSA program, the Great Falls farmers market, and through a few wholesale channels including a grocery store and restaurants. Vegetable seed is grown on contract for three national seed companies as well as Montana's Triple Divide Organic Seeds Cooperative, which the Cowgill's helped found. Prairie Heritage grows ancient and heritage wheat and barley as well as other specialty grains and markets them nationally through a mail-order subscription box. The farm's newest enterprise is Blue Truck Bread, which utilizes the farm's heritage wheat in an on-farm sourdough bakery.

PAPER POT TRANSPLANT SYSTEM

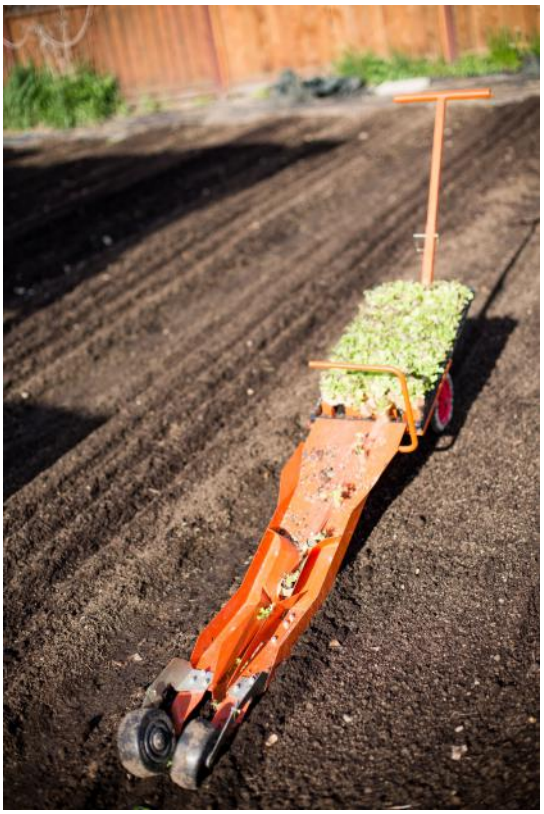
In Jacob's words, "the Long Chain Paper Pot Transplanter is a low-tech, innovative transplanting tool for use on both large and small vegetable farms. Overall, the Long Chain Paper Pot Transplanter is a remarkable time saver, both in the greenhouse and the field. The greenhouse tools include a drop seeder frame and different sized seed plates (you can get standard sizes or custom sizes), a dibble board to make indentations in a filled tray, a paper chain opening frame and rods, and bottom trays. By filling the

Equipment Purchased

- HP-10 Long Chain Paper Pot Transplanter
- Seed Plates: 2.8, 4, and 5 mm
- Opening Kit (frame & rods)
- Dibble Board
- 100 used bottom trays
- Paper Pots (4 cases of 6" pots, 75 trays per case)

drop seeder frame with seed and sliding the seed plate, you can seed a tray very quickly. Once the tray is ready to transplant in a few weeks, the paper pot transplanter makes quick work of planting 264 plants (1 tray) into the field. While it's not a perfect tool, I found it worked remarkably well, even in my heavier clay loam soil."

Transplanting paper pots into the field. *photo: paperpot.co*



The Paper pot transplanter *photo: paperpot.co*

THE PAPER POT SYSTEM AT PRAIRIE HERITAGE FARM

Jacob found that the Paper Pot system was a huge time saver for Prairie Heritage Farm, making it economically feasible to transplant beets and spinach, increasing the number of successions per season. Using the system for beets also eliminated the need for thinning in the field. Assuming good germination rates, plant spacing was very consistent making weeding easier as well.

The tool presented some additional costs and challenges as well. In addition to the initial cost of the tools, there is an annual price tag of $3-5 per paper chain. If germination is poor, the paper chain may be a loss. The chains come in odd sizes (44', 88', 132') leaving the choice between extra plants or too few in the bed.

Spinach bed, where exposed paper chain can snag on weeding tools

The paper pot system requires close to ideal conditions for best use. Jacob found that the field must be as clean as possible as debris, or overly wet soil can cause the chain to break. Timing is also important as overgrown roots can cause the paper to tear during transplanting, and the smaller cell size compared to plastic trays means a narrower timing window. Jacob also found it difficult to pull the heavy tool through the inner rows of the bed. He also recommends, “if the plants stop getting covered by the transplanter and the chain begins to ride up on top of the soil, it’s best to break the chain and reset the chain. Go back and hand plant the chain that didn’t get covered.”

For seeding, Jacob found pelleted lettuce seed to be easier to work with in the system, and found that brassica seed stuck to the plastic tray, due to static build up in a low humidity environment. Due to density of the paper pot trays, thinning in the flat was not possible and this work had to be done in the field.

Jacob also notes that hoe cultivation must be done carefully as snagging the paper between plants can cause uprooting.

FARM ENHANCEMENT BY THE NUMBERS

To track the impact of the paper pot system at Prairie Heritage Farm, Jacob timed his planting process for spinach, including filling and seeding trays in the greenhouse and transplanting them into the field. His records show the impact the paper pot system had on his farm, in the graphic on the next page. Jacob cautions “All the following data is based on one season and one person’s use. There are likely others who can hand transplant much faster than me.”

Prairie Heritage Farm grows on 50’ long, 30” wide beds. Spinach is planted 4 rows to a bed, with 6” in-row spacing. This means each bed holds 200 row feet of spinach and approximately 400 plants. Jacob typically uses 72-cell plastic trays for transplants, but the paper pot system trays hold 264 cells.

The paper chain unfurls to space the plants correctly in the row *photo: paperpot.co*

TIME COMPARISON

	BEFORE: Hand Seed & Transplant	AFTER: Paper Pot System
Fill & Seed One Tray	5 mins	4 mins
Trays per Bed	6	2
Transplant One Tray	8 mins	5 mins
Total Time per Bed *(Time to fill & seed + time to transplant) x number of trays per bed*	78 mins	18 mins

Additional Resources

Paper Pot Tray System at Prairie Heritage: https://youtu.be/xLNw0DBedIw

MT Dept of Agriculture Specialty Crop Block Grants: The purpose of this program is solely to enhance the competitiveness of specialty crops in Montana. To find funding opportunities and more information, visit: agr.mt.gov/SpecialtyCropBlockGrants