

FIELD
TESTED



Mechanical Seeding & 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 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.

FOURTH WAVE FARM | STEVENSVILLE



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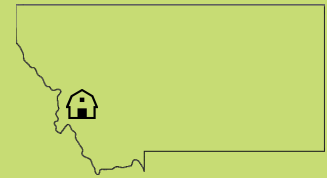
Fourth Wave Farm Snapshot

Location: Stevensville, MT

Operator: Lindsey Aull

Acres in Production: 4

Crops: Diverse Vegetables,
specializing in Storage Root Crops



INTRODUCTION

In January 2017, Lindsey Aull purchased a 3-row Planet Jr. seeder mounted on a tool bar and a Buddingh basket weeder. These tools have enabled her farm to use a tractor to complete jobs that she previously completed by hand. The increased time efficiency of the tools has allowed Lindsey to scale up her production of storage crops and collaboratively lease a larger piece of land with another farmer in her area. Lindsey knows that a lot of specialty crop producers in her



Lindsey adjusting the Planet Jr. seeder

area are thinking about scaling up and there are a lot of tools they can choose from. She hopes this report will help other specialty crop growers better estimate the financial and time investments of hand cultivation versus different mechanical cultivation options to find the tools that are right for their operation.

FOURTH WAVE FARM



Germinating beds at Fourth Wave Farm

Fourth Wave Farm was founded by Lindsey Aull in 2012 on 4 leased acres in Stevensville, MT. Lindsey operated the farm independently for 6 seasons on that site, producing a diverse mix of vegetables for the Western Montana Growers Coop and the Hamilton Farmers Market. Lindsey grew up on a conventional turkey and drylands grain operation in central North Dakota and when she started her farm, she wanted it to more directly reflect her values of a stronger local food system, accessible to all. Lindsey developed a specialty in storage root crops

including Celeriac, Carrots, Beets and Onions, which she markets through the Western Montana Growers Cooperative to wholesale customers. In the 2018 season, Lindsey partnered with Mill Crick Farm to lease an 80 acre parcel in Corvallis, MT and moved her operation there, significantly expanding her production.

PLANET JR. 3-ROW SEEDER

In anticipation of expanding her acreage, Lindsey chose the Planet Jr. 3-Row Seeder to mechanize her planting process. The tractor mounted seeder plants three rows in one pass and can be adjusted for row spacing and seed depth. The Planet Jr. Seeder has a long history of use on small farms, and it's simple design makes it versatile to use with a range of seed sizes from carrots to corn. The



Planet Jr Seeder, belly-mounted on the Allis Chalmers

heavy-duty parts are durable and replacements, when needed, are easy to find. Lindsey purchased a used seeder that needed some repairs that were not immediately apparent. Lindsey recommends finding someone with Planet Jr. experience to look it over upon purchase to ensure good working order and save time in-season.

Equipment Purchased

- Planet Jr. 3 Row Seeder- \$1600 used
- Buddingh Basket Weeder - \$2600 used

BUDDINGH BASKET WEEDER

The Buddingh basket weeder mounts to the belly of the farm's Allis Chalmers tractor for precision cultivation in small seedlings. The rolling wire "baskets" can be used very close to crops without damaging leaves. The tool spacing is not easily adjusted in the field, and Lindsey keeps it at 15 inches between rows, and plants crops to that spacing. While Lindsey had to adjust some of her bed spacing to fit this tool, she likes not having to make setting adjustments to the implement every time she uses it. Even though adjustment time is a small difference, Lindsey felt that this made her much more likely to make a quick cultivation pass rather than putting it off and missing the window of opportunity.

Lindsey finds the Buddingh an excellent tool for weeding seedlings in the "string" stage. It does not throw soil during operation which means the fragile plants don't get buried. Though designed to cultivate small weeds, Lindsey found it was "still worth it to run through" weeds in the stage pictured at right.



At Fourth Wave, the spacing on the Buddingh is set for three crops rows spaced 15" apart



"It did a better job of getting weeds this size than we thought it would"

For larger plants and transplants, Lindsey prefers to use a sweep, which moves the soil slightly and buries the small weeds right against the crop.

OTHER TOOL CONSIDERATIONS

The Planet Jr. Seeder

The Planet Jr. is not a singulated seeder, meaning it does not drop individual seeds like more modern seeders. The seeds simply fall through an adjustable hopper when the seeder is engaged. Lindsey recommends a singulated model if you can afford it. At Fourth Wave, there was a learning curve to find the right tool depth and settings to get the right seeding rate. Erring on the side of too much seed helped to ensure that harvest targets would be met, but increased the need for timely thinning.

Lindsey recommends assigning one person on the farm to the Planet Jr. tasks. They will get lots of repetitions to figure out the best settings for use and practice spotting issues like clogged hoppers (see picture, above right). If there is enough space, Lindsey says planning for a “throwaway bed” to test different settings would help speed up the learning curve during the season.

There's always room for improvement with a new tool, but the Planet Jr. did a good job for Fourth Wave in the first season



An unseeded row due to a clogged hopper



The Buddingh Basket Weeder

The Buddingh was best in a very level seed bed and rocks in the soil frequently cause it to skip. Lindsey says she would not recommend this tool to anyone growing in very rocky soil. Depressions in the bed surface can also cause the Buddingh to miss weeds, leaving areas that need to be spot weeded by hand. Lindsey estimates this was about 10% of the bed surface in her field and identified smooth bed surfaces as an important next step in reducing her cultivation time. While this might not be a serious concern for a small area, these small factors make a big difference at a larger scale, where 10% of ten beds, is an entire bed!



Rocks or depressions in the bed surface can cause the Buddingh to miss weeds

FARM ENHANCEMENT BY THE NUMBERS

The Planet Jr. and Buddingh made a significant time improvement on the previous hand-systems at Fourth Wave Farm, allowing Lindsey to significantly expand her production in the 2018 season. During the 2017 season, Lindsey tracked the time it took to seed and cultivate a block of beets with the new tools and compared these times to estimates from the previous 5 seasons.

The impact graphic on the following page compares Lindsey's time input with the Planet Jr. and the Buddingh to previous systems. In the previous system Lindsey planted four rows of beets per bed with six 200-foot beds in a block. To fit the Buddingh spacing, she switched to 3 rows per bed. The numbers in the chart compare times for the 6-bed block ($6 \times 4 = 24$ rows) in the old system to 8 beds ($8 \times 3 = 24$ rows) with the new system so the number of row feet is the same in each.

Additional Resources

Planet Jr 3-Row Seeder at Fourth Wave: <https://www.youtube.com/watch?v=1bcUvDbqIEw>

Buddingh Basket Weeder at Fourth Wave: <https://youtu.be/gb9z6uPY-Tg>

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

TIME COMPARISON

BEFORE:

6 beds x 4 rows = 24 rows



Single Row Hand Seeder

Seeding

AFTER:

8 beds x 3 rows = 24 rows



Planet Jr. 3-row Seeder



Wheel Hoe

Weeding



Basket Weeder



Basket Weeder



Wheel Hoe or
Hand Weed



Basket Weeder



Hand Weed cleanup
takes less time after
basket weeder

390 mins

Total

160 mins