

**2018**

**Staff Contact**

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**RESEARCH REPORT** Strawberry Establishment and Production Enterprise Budget

**In a Nutshell:**

- Lee Matteson and Rose Schick determined differences in cost and labor for strawberry bed establishment using two methods: biodegradable plastic and a matted row of mulch.
- The farmers tracked labor, expenses, yield, and revenue during the establishment year and the first year of harvest.
- Strawberry yields were low in 2018 due to extreme heat in May.
- Even with poor yields, the biodegradable plastic system provided a net profit of \$0.66/lb. The straw mulch system had a net loss of \$0.50/lb.
- The strawberry variety Cavendish performed poorly in the heat.

**Cooperators**

Lee Matteson & Rose Schick - Nevada

**Funding**

This project was supported by:  
 IDALS Specialty Crop Block Grant;  
 Ceres Trust

**BACKGROUND**

Locally-grown strawberries are in high demand at markets, but the time and labor demands of growing them make strawberries a trickier crop to manage than many realize. The plants require a year of establishment before the first harvest; preventing competition from weeds is critical. In this trial, Lee Matteson and Rose Schick of Nevada compared the enterprise budgets for strawberries under two methods of establishment: matted rows mulched with corn stalk mulch, and planted into biodegradable plastic mulch. For two years, the farmers tracked expenses, labor, yield and revenue on four varieties of strawberries to

determine which establishment system was better for their farm.

**Objective:** Compare labor, yield, and profitability of strawberries under two plant establishment systems.

**METHODS**

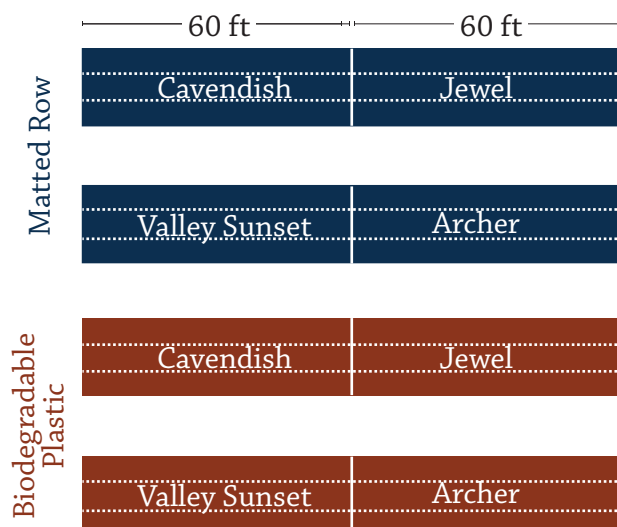
This project compared enterprise budgets of strawberry production under two establishment systems and was conducted by Lee Matteson and Rose Schick on their farm near Nevada. The farmers planted four varieties of strawberries – Cavendish, Valley Sunset, Jewel and Archer – in 60-ft long beds under two different mulch systems used for

weed suppression. One set of strawberry plants was planted into biodegradable plastic mulch, the other set of strawberry plants was planted into cornstalk mulch and established as a matted row, as shown in **Figure 1**.

Strawberries were planted on Apr. 20, 2017; with their first bearing year in 2018. Under both treatments, strawberries were planted in double rows, with 6 in. between plants within the row and 12 in. between rows. The sets of double rows were spaced 4 ft apart.

In addition to yield data, Matteson and Schick tracked labor hours by task, expenses and revenue to compare enterprise budgets for strawberry production under both systems.

**Field Trial Schematic**



**FIGURE 1.** Schematic of the field setup at Matteson/Schick, with two mulch treatments and four strawberry varieties. Note that this was a side-by-side trial for enterprise budget purposes, not a replicated trial.

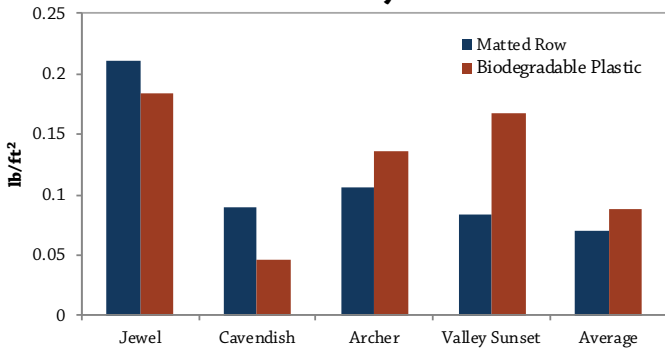


Early trial setup, with biodegradable plastic laid and matted row uncovered.



Strawberry plants being transplanted into the biodegradable plastic.

## Strawberry Yields



**FIGURE 2.** Strawberry yields for each variety and mulch treatment, and the average of all varieties.

Data was sent to Practical Farmers of Iowa for analysis.

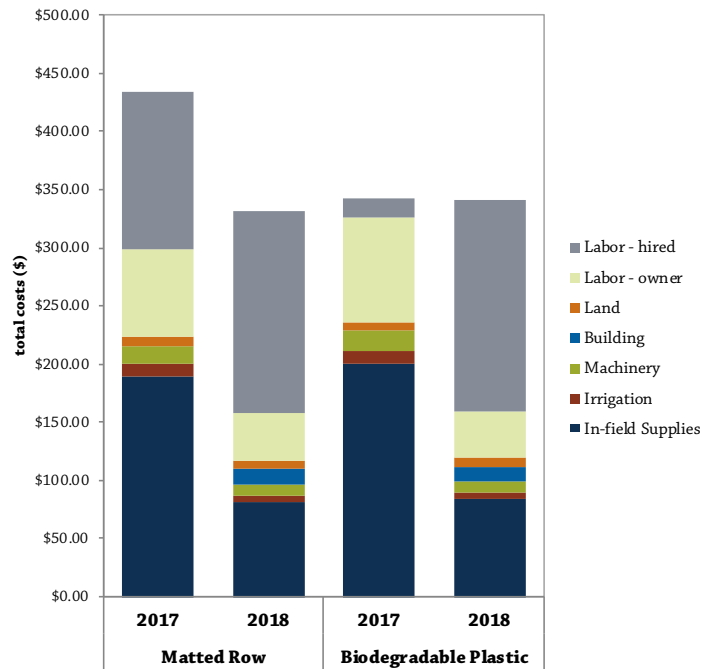
## RESULTS AND DISCUSSION

Unfortunately, 2018 was a very poor strawberry season due to extreme heat in May (**Table A1**; yields by variety under each establishment system are shown in **Figure 2**). Typically, strawberry picking lasts five to six weeks; the 2018 season last only two weeks, and the farmers harvested about 15% of what they normally expect. According the Schick, Cavendish did not handle the heat at all, and fruit became unsellable. Jewel appeared to perform the best. Because the varieties were not randomized and replicated, statistical means comparisons could not be done on this trial. Overall, the plants established on the biodegradable plastic produced 10 pounds

more than the matted row. Though it was not a good year to track yield information, the labor and expense data was still very informative to Matteson and Schick, moving forward.

Even with the unfavorable weather, the single season of strawberries picked on the biodegradable plastic system did provide a positive net return of \$0.66/lb over the two years of expenses, as shown in **Table 1**. The matted row resulted in a net loss of \$0.50/lb. This was due to more labor costs – particularly in the establishment year – and slightly lower average yield across

## Cost Breakdown, 2017 and 2018



**FIGURE 3.** Breakdown of expenses by task for each mulch type, for the establishment year (2017) and first harvest year (2018).

varieties.

**Figure 3** shows the breakdown of expenses for the establishment year (2017) and first year of harvest (2018). In 2017 the matted rows required nearly twice the labor cost of the biodegradable mulch rows. This was impactful, as labor accounted for 48% of the matted row system's expense during the establishment year (labor was 31% of the biodegradable plastic system's expense during 2017). In 2018 total expenses between the two establishment systems differed by only \$1.50. Though 2018 expenses were nearly identical, with higher expense over the two years and slightly lower fruit yield in the matted row in 2018, the matted row system was less profitable.

**TABLE 1.** Revenue, expense and net returns for strawberries under two establishment methods.

MULCH TYPE (TREATMENT)	MATTED ROW		BIODEGRADABLE PLASTIC	
	2017	2018	2017	2018
PRODUCTION YEAR				
Marketable Harvest (lb)	0	118	0	128
<b>TOTAL REVENUE</b>	0	\$708.00	0	\$768.00
Revenue per ft <sup>2</sup>	0	\$0.74	0	\$0.80
<b>Total in field supply costs</b>	\$190.00	\$82.00	\$201.00	\$84.00
Irrigation	\$10.00	\$5.00	\$10.00	\$5.00
Machinery	\$16.00	\$10.00	\$18.00	\$10.00
Building	0	\$13.00	0	\$13.00
Land	\$7.50	\$7.50	\$7.50	\$7.50
Labor - owner	\$75.00	\$40.00	\$90.00	\$40.00
Labor - hired	\$136.00	\$174.50	\$16.00	\$181.50
<b>TOTAL COSTS</b>	\$434.50	\$332.00	\$342.50	\$341.00
Cost per pound	0	\$6.50	0	\$5.34
Cost per ft <sup>2</sup>	0	\$0.80	0	\$0.71
<b>ANNUAL NET REVENUE</b>	-\$434.50	\$376.00	-\$342.50	\$427.00
2-year combined net income		-\$58.50		\$84.50
2-year combined net \$/lb		-\$0.50		\$0.66
2-year combined net \$/ft <sup>2</sup>		-\$0.06		\$0.09

## CONCLUSIONS AND NEXT STEPS

Inclement weather – the combination of a very hot May followed by a very wet June (**Table A1**) shortened the strawberry harvest in 2018. Because of the irregular season, the results of this trial were not definitively conclusive for Matteson and Schick. The biodegradable plastic system was more profitable in 2018, and had

a more efficient harvest due to the system’s compact rows. Said Schick, “In general, the plastic kept a more compact row as the plastic prevented runners from suckering in the first year. The matted row spread out, making for more plants but harder to pick as the row became too wide and ran into the bed next to it. The black plastic had less weeding the first year but by second year the biodegradable plastic

was gone and labor needed for weeding was the same in both types.”

A more traditional harvesting season might have provided a different yield portrait of the two systems. Would more suckering plants, widely spread in the rows, increase yield over six weeks of picking? Or are labor-hours worth more during picking season, placing priority on efficient harvest?



Jewel strawberries.



Lee Matteson picking strawberries in June.

## APPENDIX – WEATHER CONDITIONS

**TABLE A1. Climate data for 2018 and historical averages.**

MONTH	GROWING DEGREE DAYS (BASE 50 °F)		RAINFALL (IN.)	
	2018	AVG.	2018	AVG.
April	98	182	2.2	3.3
May	519	379	4.4	4.4
June	674	594	7.4	4.9
July	700	714	3.5	4.1

Monthly growing degree days and monthly rainfall for the current year and historical averages are reported from the nearest weather station. Climate data were accessed from the Central (Nevada) weather station.<sup>[1]</sup> Historical data include years 1980-2018.

## REFERENCES

1. Iowa State University. Iowa Environmental Mesonet. <https://mesonet.agron.iastate.edu/> (accessed March 2019).



### PFI COOPERATORS' PROGRAM

PFI’s Cooperators’ Program gives farmers practical answers to questions they have about on-farm challenges through research and demonstration projects. The Cooperators’ Program began in 1987 with farmers looking to save money through more judicious use of inputs. If you are interested in conducting an on-farm trial contact Stefan Gailans @ 515-232-5661 or [stefan@practicalfarmers.org](mailto:stefan@practicalfarmers.org).