Can low-input season extension techniques make okra more feasible?

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Okra can be grown here, but it is a somewhat marginal crop. Yields fail to reach the crop's full potential, often seeing local production of ¼-½ lb per plant. Okra in WNY is limited by length of growing season, especially planting delays waiting for the soil to stay above 65-70 degrees.

Working with Wil Moss of Moss Fresh Fruit and Vegetables, we tested methods for extending the okra production window:

- Bare ground
- Using black plastic mulch to raise soil temperatures
- Floating row cover for 3 weeks after transplanting to trap heat
- Black plastic mulch + floating row cover for 3 weeks after transplanting

Buffalo Bill '91, advertised as being an early yielding 43 day crop, was used in the trial. It was informally compared against Jambalya, a 50-55 day standard okra variety. No long-simmering heartbreak here, Buffalo Bill '91 okra easily won the earliness game with the bare ground treatment producing by 47 days after transplant.

The trial was planted on June 7th using young (1 true leaf) transplants. The field soil and night temperatures were just becoming favorable for okra production. Field configuration was 18" in-row on single row beds. Harvest began on July 20th and proceeded until September 18th. Remember that this past year started with a cool, dry, smoky June and became very wet in the second half of summer. Not ideal growing conditions for okra.

From left: bare ground, row cover, black plastic, and black plastic plus row cover treatments on June 20th, 13 days after transplanting. Note the difference in presence and size of first lobed leaf. Alt text: A four panel composite showing the trial treatments. Each panel contains 3-6 small okra plants looking down the row from slightly above ground level.

RESULTS

Yield

Season long yield per plant was calculated in pounds / plant (Figure 1). The bare ground plot produced a 0.26 pounds of fruit per plant. Black plastic alone and floating row cover for the first 3 weeks both raised production to 0.39 lb/plant, a 50% yield boost. **The combination of floating row cover and black plastic bumped yield by 66%, producing 0.43 lb/plant.**

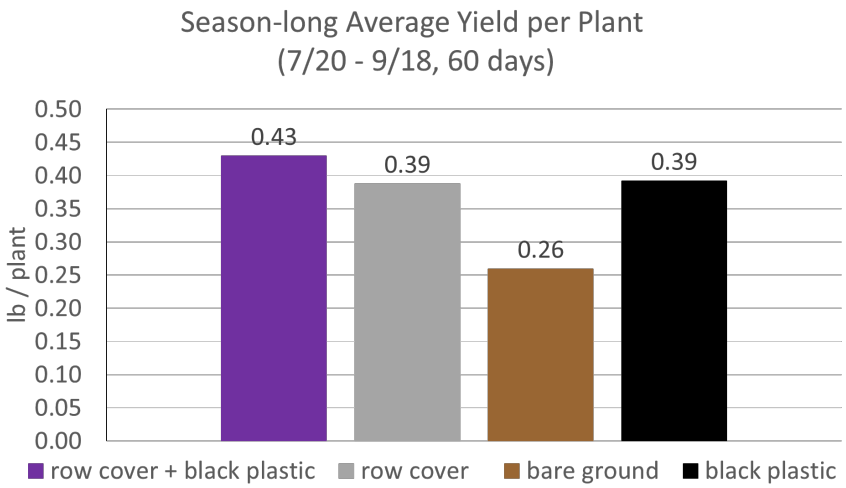

Figure 1. Per-plant yield of 'Buffalo Bill '91' okra on bare ground compared to three low-intensity season extension techniques.

Earliness

All three low-input season extension techniques reduced the average days to first harvest. The average days to harvest for the bare ground treatment yielded after 47 days. The row cover only treatment came in at 44.3 days. The black plastic alone and black plastic + row cover treatments both fruited by 43 days.

By combining black plastic with a very early variety, we were able to get fruit about two weeks faster than most varieties will produce in our region. Having fruit at 43-47 days positions you ahead of the competition in the market place. But what good is that if the fruit supply is only trickling in? Did any of these treatments shift the timing of when the fruit came in the production cycle?

Yes, there are interesting things happening when you look at distribution of the total yield over time (Table 1). Since most varieties come in around 56 days, I looked at the proportion of season-long yield that was ready before day 56.

The bare ground treatment showed Buffalo Bill '91's natural potential and is the background level that the other treatments should be compared to. Black plastic alone and row cover alone improved on the bare ground treatment by 5 & 6 percentage points. **When black plastic and row cover are combined, the percentage of early yield shot up to 25% of the season total,**

which is 16 percentage points better than bare ground and 9-10 percentage points better than either technique alone.

Intriguingly, this improvement in proportion of early yield for the combo compared to the black plastic alone is not simply due to the crop coming in sooner – both treatments started yielding the same day. So, while warming the soil appears to be the most effective at shortening a variety's days to harvest, the addition of row cover to warm the air helps concentrate early fruit set. This is supported by the larger size of the combo plants. Having more nodes, they could set more fruit. Further support comes from the fact that the row cover only plants managed to keep up with the black plastic only treatment despite having fewer days of early harvest.

Table 1. Characterization of early yield for each treatment

Treatment	Average days to harvest	# of days of early production (before day 56)	% of total yield in early window (before day 56)
Bare ground	47	9	9%
Black plastic	43	13	14%
Row cover	44.3	11.7	15%
Black plastic + row cover	43	13	25%

Economics

Does shortening the time to harvest and shifting a greater portion of yield into the early window actually pay off? Here are some estimates of the economic differences between techniques. First, some pricing background.

1. The plastic mulch cost us $43.50 per 1000 linear feet, excluding tractor work (laying) costs
2. We did not use drip tape, the plastic treatments were irrigated by hand as necessary
3. Row cover cost $378.00 per 1000 linear feet
4. Because row cover is reusable, we assumed conservatively assumed only 3 reuses and reduced cost to $126.00 / 1000 linear feet.
5. Grower feedback from a statewide meeting suggested that $4.50 / lb is a typical okra price. Growers said they can get about a dollar more per pound for early okra.
6. I didn't factor in labor savings thanks to reduced weeding time for the black plastic containing treatments. They took only a fraction of the weeding time that the bare ground and row cover only treatments needed.

Bare ground okra has the lowest input costs and also delivers the lowest yield. It fell far behind all the low-input season extension techniques in terms of economics. **Black plastic mulch + row cover yielded the most fruit and brought in more money before expenses than any other treatment when selling season-long at $4.50/lb.** But the black plastic alone slightly

outperformed it economically at $4.50/lb once you take the material costs into account. The row cover expense drags the economic performance of the treatments employing it. That effect lessens the more times row cover is reused.

If you can command $1/lb more for early okra, then black plastic + row cover regains its position as the most economically favorable low-input season extension technique. The greater proportion of early occurring yield offsets the relatively higher costs.

TAKE HOME MESSAGES

This trial demonstrated that combining low-input season extension techniques can increase okra revenue by 33-45% compared to bare ground production. We demonstrated that all three approaches accelerated growth and precociousness, leading to earlier harvest and heavier early yields. The work also anecdotally verified that 'Buffalo Bill '91' is truly an early yielding variety in our climate and can produce fruit sooner than 'Jambalya'.

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