WEED MANAGEMENT IN ORGANIC POTATOES:
STRAW MULCH AS AN ALTERNATIVE TO CULTIVATION

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THE PROBLEM

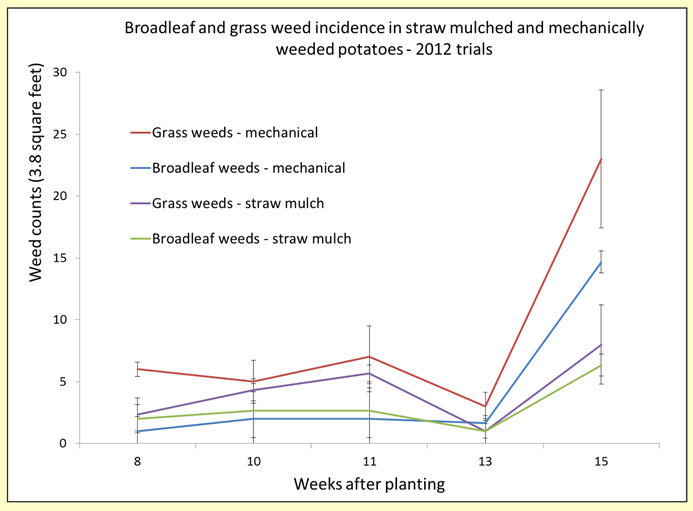
- Weed control is a challenge for organic farmers, who use multiple weed management strategies
- Long term cultural practices, such as intensive cover cropping and diverse rotations, aim to reduce the weed seedbank, while short term control relies largely on mechanical cultivation
- Mechanical hilling and tine weeding are the most common weed control methods in organic potato production
- In addition to weed competition with potato plants, quackgrass roots damage potato tubers
- In research conducted on organic certified land at the West Madison Agricultural Research Station, we compared mechanical tillage with straw mulching as weed management strategies

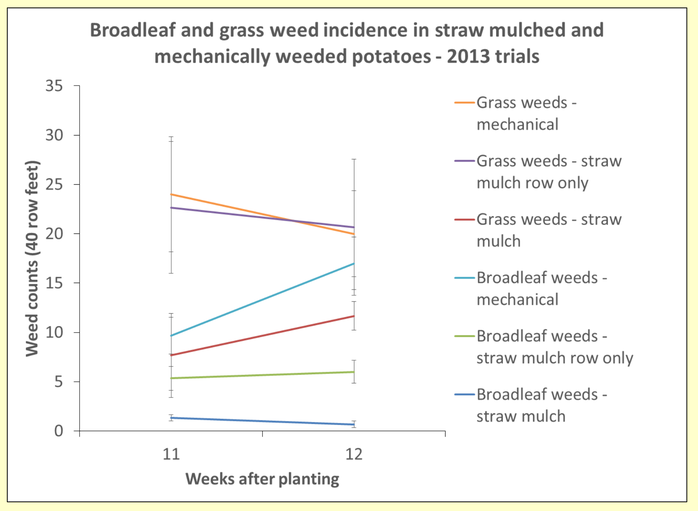
METHODS

- In 2012 and 2013, certified seed potatoes of cultivar “Freedom Russet” were planted on organically managed land at the West Madison Agricultural Research Station. Freedom Russet was chosen since it is one of the few russet varieties that performed well under organic management in our previous variety trials.
- Potato crops were hilled after emergence, and subsequently, ‘straw mulch’ plots were covered with 8-10 inches of straw mulch, while “mechanical weeding” plots were tine weeded and hilled as required.
- In 2013, an additional treatment, “straw mulch – row only”, had straw placed only in the row
- In 2013, rain impeded tine weeding, so “mechanical weeding” plots were hilled only.
- Weed numbers were monitored through the season, and yield of A size and B size tubers was recorded.

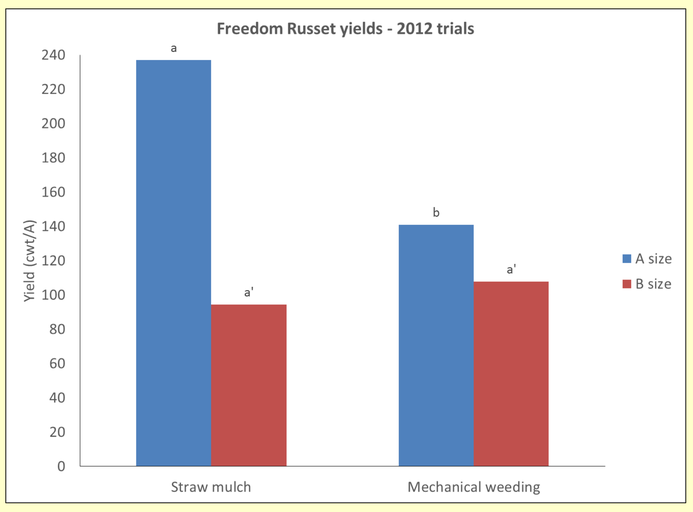
RESULTS

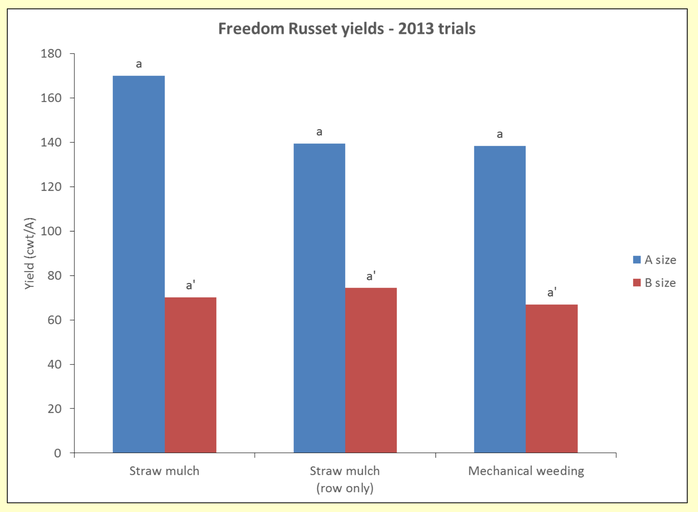
Weed control: In both 2012 and 2013, straw mulch provided better weed control for both grass and broadleaf weeds at the end of the season when mechanical tillage was impossible. Grass weeds were poorly controlled by mechanical weeding. Straw mulch placed only in the row was no more effective than mechanical weeding for grass control, and intermediate between full mulching and mechanical weeding for broadleaf weeds.





Yield: In the 2012 drought, straw mulched plots yielded 83 cwt/A more than mechanically weeded plots. In cooler, wetter 2013, yields were not significantly different between treatments, but straw mulched plots showed the highest yields.





CONCLUSIONS AND FUTURE DIRECTIONS

A thick layer of straw mulch provided effective control of both grass and broadleaf weeds in organic potato plots. We found mechanical weeding to be less effective for weed control, in part due to rain which made it impossible to tine weed at the appropriate time.

Our continuing research (funded by the Ceres Trust) will further investigate the role of straw mulch on working organic farms for weed control, soil health and moisture retention, pest and disease management, and how these effects may impact potato yield. We will compare the economics of weed management with straw mulch or mechanical tillage.

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