

# A systems comparison of cultivation-based versus mulch-based weed control in yellow onion (*Allium cepa*)

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## Which Strategy to Choose?

### Critical Weed Free Period

Cultivate only when the crop is in its sensitive adolescent stage.

### Zero Seed Rain

Cultivate frequently so weeds do not set seed. This reduces weed pressure in subsequent years.

### Plastic Mulch

Suppresses weeds with a layer of plastic film.

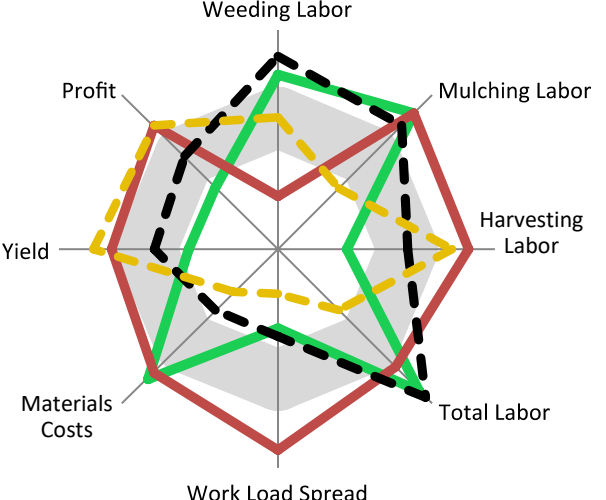
### Organic Mulch

Suppresses weeds and builds soil.

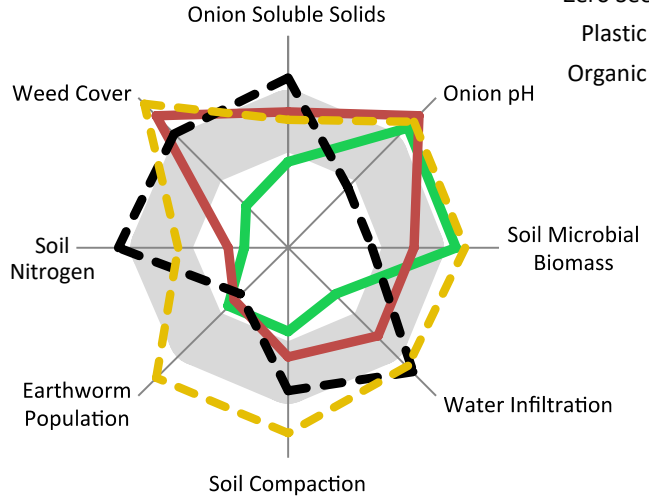
### Results

We implemented each of these strategies using onions as a test crop. We recorded labor, expenses, yield, weed and insect pest pressure, and several measures of soil quality. These measures have allowed us to generate the following star diagrams that demonstrate the economic and biological strengths of each strategy. The larger the area the more favorable the strategy. Values separated by the grey band are significantly different (Tukey's HSD, alpha=0.05, df=23).

### Economics



### Biology



### Conclusions

As expected, the Critical Weed Free Period was the least costly strategy but least beneficial to biological health, while the reverse was true of the Organic Mulch strategy. Unexpected results included the underperforming yield of the Critical Weed Free Period and Plastic Mulch strategies. It was also unexpected that the Zero Seed Rain and Organic Mulch strategies would be the most profitable strategies in their first year of implementation since they are the most labor intensive and are focused on achieving long-term biological benefits.

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