

# Integrated soil and weed management production systems for perennial food crops

**Abstract:** Several alternative weed management tactics for strawberry and grape production were tested for their effects on weed control, crop yield and soil quality enhancement.

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*Alternative weed management practices reduce herbicide use, which compromises sustainability due to negative environmental impacts. These practices can be used by Iowa grape and strawberry growers to control weeds while maintaining crop yields, fruit quality, and soil quality.*



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## What was done and why?

Strawberry and grape growers are looking for sustainable weed management options and improved tools to monitor and assess soil quality. The project investigators considered a variety of practices and programs that might work for these specialty crop producers.

Two key objectives were to:

1. Evaluate the viability of two conventional and two alternative weed management systems and their effects on the selected physical, chemical, and biological soil properties in June-bearing strawberry and grape ecosystems in Iowa.
2. Raise the level of awareness among Iowa fruit and vegetable growers about the soil quality concept and provide opportunities for growers to learn how to implement crop and soil management practices that improve soil quality.

## What did we learn?

All weed management systems used in the strawberry and vineyard experiments inhibited weed growth to acceptable levels. Effective alternatives to conventional weed management practices of herbicide and pre-plant soil fumigation used living mulch and straw mulch.

The alternative management practices used in these experiments maintained or improved soil quality attributes compared to conventional practices. In the strawberry experiments, adding straw mulch for weed control resulted in larger numbers of earthworms and increased cation exchange capacity, which can be considered improvements in soil quality.

Strawberry plant growth was inhibited by the alternative weed management strategies. The living mulch and straw mulch reduced strawberry plant growth compared to the herbicide and fumigation + herbicide treatments. Additionally, researchers saw the reduced vigor of grapevines in the living mulch treatment. Data correlating the reduced plant growth to yields were indeterminate and further research is needed before this issue can be addressed.