

Vetch cover crop, fertilizer practices recommended for organic zucchini

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Cover crops may be in the hardest working plants in organic farming systems. A variety of dependable cover crops are used to subdue weeds, build productive soil, control pests and diseases, and enhance overall sustainability of organic systems. In a new study, the popular cover crop Vetch (*Vicia sativa L.*) was used in a 2-year field experiment. The experiment was designed to determine the effects on organic zucchini yield and quality of vetch residue management strategies incorporating green manure using a roller-crimper and organic fertilizers.

To allow for timely crop rotation in organic farming, the growing cycle of cover crops is often terminated before natural maturity using mechanical chopping and/or plowing, field disking, mowing, or crushing with a roller-crimper. Innovative conservation tillage production systems using roller-crimper (RC) technology to end cover crops are gaining popularity. The technique uses one or two passes of the RC to flatten the cover crops, leaving a thick mulch layer into which the next crop is sown or transplanted. The thick mulch hinders the development of weeds during the critical growing period, contributes to reduced soil erosion, and increases soil moisture and fertility.

Although the roller-crimper technology has been widely used for the termination of legume cover crops, the technique has its limitations. For example, difficulties determining the most effective cover crop growth stage for crop termination can result in insufficient or untimely amounts of nitrogen being delivered to the cropping system by legume [cover crops](#), ultimately affecting crop yield. Supplementing crop fertility with

off-farm organic compliant inputs to reduce nitrogen deficiencies can help to ensure acceptable crop yields.

A study published in the August 2013 issue of *HortScience* showed the influence of different vetch residue management strategies in combination with the application of organic fertilizers and amendments in an organic zucchini production system. The scientists used municipal solid waste compost, anaerobic digestate, and a commercial organic fertilizer in the field experiments designed to determine yield, yield components, crop quality, and soil nutritional status in organic zucchini fields in southern Italy. The experiments were conducted over two seasons.

"Our results showed that zucchini yield was influenced positively by the vetch residue management strategy, although the response was significantly different between years," the scientists said. "The vetch cover crop increased marketable zucchini yield in the first year by 46.6% compared with the fallow treatment, indicating that this fertility-building crop could reduce off-farm nitrogen (N) fertilizer input for subsequent crops. Averaging over 2 years of the experiment, marketable zucchini yield increased by 15.2% and 38% with the roller-crimper mulch and green manure plow-down, respectively, compared with the fallow treatment, although differences were significant only in the first year."

The application of organic fertilizers in vetch management plots increased marketable zucchini yield by 21.8% in the first year compared with the unfertilized control. "This result is particularly relevant, because organic fertilizers were applied at about 50% of the normal application rate for zucchini after taking into account biological N fixation attributable to the vetch," the scientists noted. "The greatest yield response was obtained in the green manure treatment, probably as a result of high aboveground biomass production that, when incorporated

into soil, progressively mineralized and increased the available N content," said the study's lead author Francesco Montemurro.

Montemurro also noted that the findings indicated that both cover crop and application of organic fertilizers and amendments in zucchini [organic farming](#) are constrained by environmental conditions, and that the effects are most valuable when typical or favorable weather patterns occur.

More information: [hortsci.ashspublications.org/c ...
t/48/8/1027.abstract](https://hortsci.ashspublications.org/content/48/8/1027.abstract)

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