

Use of Living Mulch and Companion Plants in Organic

Cucumber Production

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Introduction

To address the need for more effective methods of insect and weed control in organic vegetable production, an experiment was conducted to determine where the use of a living mulch and insect-detering companion plants could improve the yield of organically-grown cucumbers.

Materials and Methods

In spring of 2003 the WTES organic research field was diced, field-cultivated, and divided into main plots 18.5 ft wide and 50 ft long. Each main plot was divided into three sub-plots to accommodate a split-plot, 4-replication design, with living mulch as the main plot and companion plantings as the sub-plot. Within each sub-plot, two 3 x 10 ft row areas on five-ft centers were marked and fertilized on 13 May with the following organic materials: blood meal (30 lb/1000 ft²), rock phosphate (60 lb/1000 ft²), and greensand (80 lb/1000 ft²). After the fertilizers were broadcast, Dutch white clover (*Trifolium repens*) was planted in the main plot area surrounding the fertilized rows using a 10-row Tye drill at a rate of 17 lb seed/acre. A compact, pickling-type cucumber variety ('H-19 Little Leaf', Johnny's Seeds) was hand-sown in the two rows of each subplot on 29 May. Nasturtium and radish, two companion plants that are believed to have a deterrent effect on cucumber beetles, were sown with a mechanized hand-seeder 1 ft on either side of each cucumber row. Cucumbers were thinned to 8 plants/row, spaced 1 ft apart. Overhead irrigation was provided and plots were mown or hoed as needed. Cucumbers were harvested weekly from mid-July to late August. Visual ratings of cucumber beetle damage and plant vigor were taken. Soil samples were collected before planting and after the final harvest from both living mulch plots and control plots.

Results and Discussion

Treatment	Yield (tons/A)	Cucumber beetle damage (5 = most damage)	Vigor (1 = least vigorous)
Living mulch	24.3 b	3.50a	1.64 b
Control	55.2 a	2.67 b	2.87 a
Nasturtium	41.8 A	3.0 A	2.86 A

Radish	21.3 B	3.44 AB	2.88 A
Control	56.2 A	2.81 B	1.19 B

The white clover living mulch significantly decreased cucumber yield and plant vigor and increased cucumber beetle damage compared to the control. Of the companion plants, radish appeared to have an allelopathic effect on cucumber plants, and nasturtium did not produce any observable increase in yield or decrease in beetle damage. While the living mulch did reduce the labor associated with weed control, the negative effects on yield and plant vigor more than outweighed this benefit.

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This research represents one season's data and does not constitute recommendations. After sufficient data is collected over the appropriate number of seasons, final recommendations will be made through research and extension publications.