

Cover Crops as Living Mulch Under Organic Vegetables at High Meadow Farm

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FAIRSHARE
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Project Description

Incorporating leguminous cover crops into vegetable rotations is known to improve soil quality and increase nitrogen availability to subsequent crops but it can be difficult for small vegetable growers to include season-long leguminous covers on limited land. Further, establishing winter covers after harvest of late season crops like winter squash and Brussels sprouts is not always feasible. Using cover crops as living mulches under vegetable crops could address both of these issues if growers can find a balance between vegetable and cover crop resource use. In the first year of this study we established two clovers under two vegetable crops while monitoring for potential loss of vegetable yields. In the second year, we will plant two vegetable crops into those established clover aisles, again aiming to minimize yield loss. If the cover crops can be established under vegetable crops in this way, small-scale growers can have more total land protected by winter covers and can increase soil quality through the use of legumes without having to take land out of vegetable production.

Project Design

The research is taking place on four organic farms in south central Wisconsin. Each farm has two replicates of the three treatments for acorn squash and Brussels sprouts. The three treatments are (1) undersown with medium red clover (MRC), (2) undersown with Dutch white clover (DWC), and (3) standard clean cultivated (Control)

Year One, 2015 - Living aisles have been established under the vegetables.

Year Two, 2016 - The two vegetable crops will trade plots and be planted into 24" tilled strips in the center of each block. At first weeding, half of each treatment will be (a) mulched with marsh hay to completely cover the tilled planting strip, or (b) maintained as clean cultivated in the planting strip (control).

Data being collected includes weed and clover densities and biomass, soil moisture, vegetable harvest data, and labor time for each treatment.

Year One Details

- week of 5/4: ground tilled to kill preceding covers; High Meadow preceding cover was alfalfa (cut worm host)
- 5/20 & 5/21: vegetable crops planted in single rows, 5' on center, 18" between plants, all vegetables planted with water and 1 pint of compost in the transplant hole, row cover used at planting on all but one farm
- 5/29: row cover removed from High Meadow crops, cut worm discovered on Brussels sprouts
- 6/2: weeded all plots; lost 60 of 133 Brussels sprout plants to cut worm at High Meadow, replanted 48 plants
- 6/9 & 6/10: weeded all plots again, hand broadcast clovers under vegetables at rate of 15 lbs/acre, weeded all plots a second time (with stirrup blade on wheel hoe) to work in seed, irrigated to germinate
- 7/7: weeded control plots
- week of 7/19: mowed all cover crops to take down weeds
- 8/11: weeded controls
- 8/25: topped Brussels sprouts, and removed weed seed heads from Brussels in row
- 9/1 & 9/2: harvested all acorn squash and some mature Brussels sprouts
- week of 9/1: mowed off acorn beds right up to the edges of the Brussels sprouts beds

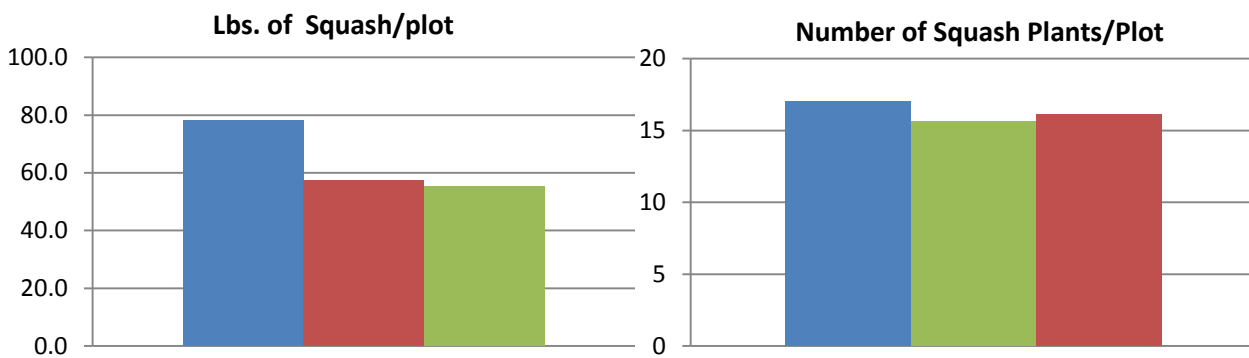
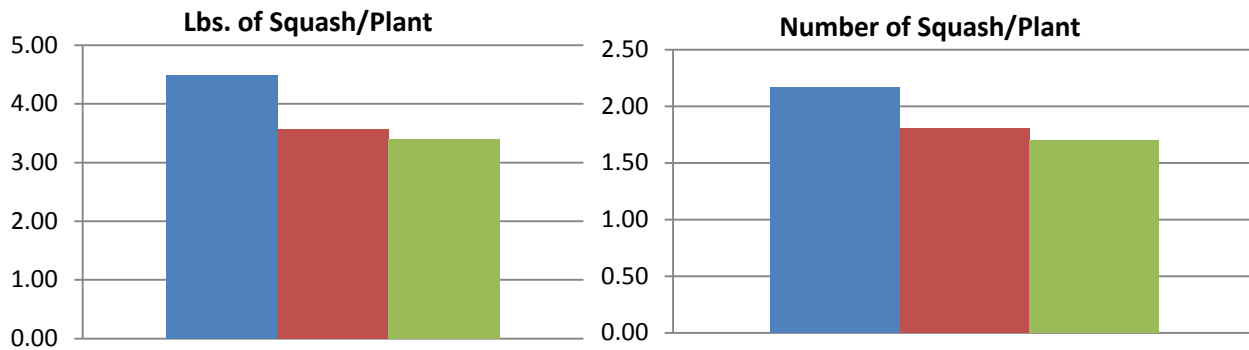
High Meadow Field Map

	field road					
Acorn 5'	1A MRC	2A DWC	3A Control	4A DWC	5A Control	6A MRC
Brussels 5'	1B MRC	2B DWC	3B Control	4B DWC	5B Control	6B MRC
	33'	33'	33'	33'	33'	33'
	farm crops					

- an old leaf pile was covering about half of plot 3 through plot 5, weed pressure is greater in that area
- most of the cutworm damage was in plots 1B & 6B, Brussels sprouts never really recovered in those areas

Preliminary Results

■ Control ■ Medium Red Clover ■ Dutch White Clover



- Vegetable plants generally look better in the control plots.
- Acorn squash had significantly higher yields in control plots. Brussels sprout harvest data is still being collected.
- Mowing cover crops in the first year was not planned, but introduced when the need arose based on weed load. One recommendation for establishment will be to mow the cover crops about 4 weeks after seeding and before the squash begin to vine out. These plots were mowed about 6 weeks after seeding, which was a bit too late.
- We still need to examine cover crop and weed densities and biomass, as well as soil moisture measurements, to determine if there are correlations between these factors and yields.
- To date, labor time in the cover crop plots has been higher than in the control plots due to the extra time needed for seeding, and mowing. We anticipate the labor demands shifting more toward the control plots in year two.

Looking Toward Year Two

While we did not realize our goal of establishing living mulch aisles under acorn squash without a loss in yield, we still hope that the year one yield results from the Brussels sprouts will be more favorable. Year two will introduce new factors as we plant the vegetable crops into established clovers that have been strip tilled and controlled for both weeds and cover crops directly under the plants.

Final Results and Recommendations

This project is funded through a SARE Partnership Grant. For access to final reports, search the SARE database for project number ONC15-011 or contact Claire@csacoalition.org.

<http://mysare.sare.org/mySARE/ProjectReport.aspx?do=viewProj&pn=ONC15-011>



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