

Principal Investigator

Hmong American
Farmers Association
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Project Duration

2014 to 2015

Award Amount

\$24,990

Staff Contact

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The Effect of Cover Crops on Water and Soil Quality

Project Summary

The purpose of this project is to introduce the use of cover crops to Hmong American fresh market vegetable farmers. This will allow Hmong growers to realize the soil health and water quality benefits that cover crops provide.

Project Description

The Hmong are political refugees from Laos who immigrated to the United States after the Vietnam War. Upon their arrival, and with limited resources, many Hmong parents used their agricultural skills to raise their families. Now, Hmong farmers are a critical part of the Twin Cities' local foods economy, accounting for over 50% of all the farmers in the metropolitan area farmers' markets.

Hmong farmers commonly lack land tenure. This has made it difficult to make long-term investments in infrastructure and soil building practices such as irrigation and cover cropping. The outlook changed dramatically when HAFA purchased a 150 acre incubator and research farm on the perimeter of the Metro area in 2014, making it possible for the farmers to begin investing in sustainable practices. A typical Hmong fresh market vegetable farm plot consists of 5 or 10 acres and is farmed by a husband and wife. Hmong growers plant a great diversity of vegetables, herbs, and flowers. It is common for one farm family to produce between 30 and 50 different species of crops.

In early 2014, the Hmong American Farmers Association (HAFA) launched a cover crop education and research project that has trained 37 Hmong farmers on cover crop benefits and the principles of soil health. The farmers have participated in three intensive half-day training sessions.

Results

One goal of this grant was to recruit six farmers to plant one acre of cover crops. Grower interest was so great that 11 have signed up to participate. Each farmer has worked one-on-one with a HAFA trainer to produce a map of their cropping sequence and to discuss where cover crops might fit in. The maps have been digitized for easy future reference.

Each farm family has been given full leeway to decide which cover crops fit their system. The most popular choice in 2014 was oats due to low cost and the fact that oats winterkill. Winter rye was the second choice. Several growers are interested in using winter rye to produce straw for strawberries and other perennials. Buckwheat was used for weed control on one farm.

Most of the farmers chose to broadcast interseed an oat cover crop into vegetables nearing maturity as a method of establishing the cover crop. A backpack broadcast spreader was used to lay down 20' wide swaths of oats at walking speed. Broadcast interseeding was successful in green beans, tomatoes, peppers, and sticky corn. The



Bla Doua Yang had good results with oats overseeded in peppers (shown in mid-October).

Harvested vegetables came out of the field much cleaner. Picking was easier in wet weather in the cover crop plots due to the support provided by the cover crop roots. One farm couple who have experienced such benefits are planning to overseed oats into their entire 10 acre operation.

Many of the farmers now understand the environmental and soil health benefits of cover crops. They have seen reduced erosion and reduced weed pressure. Reducing weed pressure is extremely important to these farmers. They do not use herbicides and rely extensively on hand hoeing in the row for weed control.

Now, several growers are interested in trying tillage radishes with oats for compaction. Small areas that had low vegetable productivity will be sown to nitrogen alfalfa (annual alfalfa that winterkills) using an oat nurse crop as an attempt to jump-start soil health.

Beyond those participating directly in the grant, there is a groundswell of interest among other growers on the HAFA farm as well as on surrounding Hmong farms. Several of these farmers will be planting cover crops in 2015. HAFA has engaged a local photographer to document in pictures how the cover crops and equipment are being used in vegetable crops. Pictures will greatly help non-literate farmers understand cover crops.

HAFA trainers are collecting soil samples for fertility, pH, organic matter and biological activity. Soil compaction is being measured on a 5 acre grid across the entire farm.

Soil compaction was measured across the farm using a constant readout penetrometer in the fall of 2014. Unfortunately, the soil was too dry to obtain accurate readings. The readings that were obtained seem to support the concern that there is extensive compaction. We will repeat the compaction tests in the spring and fall of 2015 when the soil is moist and at or near field capacity. In late fall, compaction will be measured both in mature cover crops and in adjacent fields without cover crops to determine if the cover crops are succeeding in loosening the soil.

oats that were planted in mid-August produced a large amount of biomass. Oats planted in the first week of September had much less growth.

Oats and winter rye were also seeded after cash crop removal where the soil would otherwise be bare through fall.

Mid-August is a very busy time for harvest and sales at farmers' markets. It was difficult to break away to plant cover crops. It remains to be seen how cover crop planting can fit into an already overloaded schedule. Work needs to be done to minimize the time it takes to plant the cover crops.

None of the cash crops were negatively affected by the cover crop. Surprisingly, the oats seeded in August provided frost protection to tomatoes and peppers in September and facilitated vegetable harvest by eliminating soil splash on the fruits.



Oat cover crop overseeded in sticky corn shows good growth in mid-October.



Vinai Vang and Vang Moua inspecting oat cover crop drilled after sugar snap pea harvest.

The direct effect of cover crops on water quality will be tested using a rain simulator in the fall of 2015. Rain simulations will be performed in the cover crop and where no cover crop has been planted. This will occur in late fall when the cover crop is well established.

Overall, the first year of cover cropping with the Hmong growers has been a tremendous success. Farmer interest is high and growing. Cover crop acreage is growing and farmers are finding more creative ways to fit cover crops into their vegetable systems.

Management Tips

1. When introducing growers to cover crops for the first time, consider cover crops that winterkill such as oats or radishes.
2. Taylor cover crop selection to the specific needs of the grower.
3. Think of cover crops as a long-term strategy for improving soil health and farm productivity.

Cooperators

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Project Location

From Downtown St. Paul, travel south on U.S. Hwy. 52 for 23 miles. After passing 200th St., the farm is on both sides of the highway. Turn right into the homestead for parking.

Other Resources

Cover Crops on the Intensive Market Farm. John Hendrickson. 2009. University of Wisconsin – Madison Center for Integrated Agricultural Systems. Madison, WI.

Sustainable Agriculture Network. Managing Cover Crops Profitably: Third Edition. Beltsville, MD. 301-504-5236. Website: www.sare.org/publications/covercrops/covercrops.pdf

Vegetable Farmers and Their Innovative Cover Cropping Techniques (video). Vernon Grubinger. 2006. University of Vermont Extension. www.uvm.edu/vtvegandberry/Videos/covercropvideo.html

USDA Agricultural Research Service. Cover Crop Chart. www.ars.usda.gov/SP2UserFiles/Place/30640500/CCC/CCC_v13_5_2012.pdf