

COVER CROPS: RECENT NY FINDINGS

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The past five years has seen a tremendous increase in cover crop research in NY, for vegetables, fruits, and field crops. Selected and managed properly, cover crops can provide numerous benefits to vegetable cropping systems including:

- ♣ increasing organic matter
- ♣ improving soil structure
- ♣ conserving and recycling nutrients
- ♣ preventing soil erosion
- ♣ controlling weeds
- ♣ suppressing diseases and insects

Recent research has focused on selection and management of cover crops for different vegetable cropping systems across the state, and on quantifying and maximizing the benefits listed above. Much of this research is being conducted on-farm, with growers, faculty members and Extension field staff working in cooperation to answer the important, practical questions of how to make cover crops work on diverse vegetable operations. The purpose of this presentation is to provide an overview of the types of research currently being conducted, to share some of the results and observations, and to point interested growers toward other available sources of information.

Tables 1 and 2 show recent data from on-farm and research trials on aboveground biomass accumulation for a variety of summer and fall/winter cover crops suitable for NY conditions. For each species, biomass accumulation is the highest when it is planted at the optimum time, has adequate water, good seed to soil contact, and in some cases, low weed pressure. Well managed summer cover crops, such as Hubam sweetclover and sudangrass, have the potential for the greatest biomass accumulation, but competition from weeds can greatly hinder growth. Management practices for the cover crops listed in the tables will be discussed.

Cover crops have long been known to reduce soil erosion caused by wind and water. The effect that cover crops have on other aspects of soil structure, such as compaction, has been the focus of more recent research. Some results from an on-going project looking at compaction and cover crops will be presented.

Cover crops have a bearing on nutrient cycles on a farm, particularly nitrogen. For example, fall-grown cover crops, including oats and several species of fast-growing brassicas, are excellent scavengers of leachable soil nitrogen, accumulating over 100 lbs/acre in their aboveground biomass. However, these cover crops winter kill, leaving a dead mulch on the surface of the soil. By spring, these residues only contain approximately one quarter of the original nitrogen content. The fate of the remainder is not known.

A good stand of almost any cover crop suitable for use in NY will do at least a fair job of suppressing weeds; some cover crops can do an outstanding job. Results from research trials on the use of rye mulches for pumpkins; summer cover crops for weed suppression; and interseeding cover crops for weed control in potatoes will be presented.

The use of cover crops for suppressing specific diseases is a relatively new area of study, but one that shows real potential. Sudangrass has been shown to suppress root rot pathogens on beans and to lower certain plant pathogenic nematode populations. Certain strains of brassica cover crops may also be useful in suppressing soil-borne diseases.

Table 1. Summer Cover Crops: Results from Selected On-Farm Trials. Data provided by L. Stivers, B. Caldwell, D. Riggs.

Cover Crop	Date Planted	Date Sampled	Aboveground Biomass, tons dry matter /acre	County
Hubam Sweetclover	5/9/96	10/16/96	6.4	Rensselaer
	5/26/96	10/28/96	1.3	Genesee
Yellow Blossom Sweetclover	5/9/96	10/16/96	3.6	Rensselaer
	5/26/96	10/28/96	1.0	Genesee
Crimson Clover	5/15/96	10/16/96	4.3	Rensselaer
Berseem Clover	5/26/96	10/28/96	2.1	Genesee
Cowpeas	6/7/95	9/20/95	1.3	Erie
Nitro Alfalfa	5/9/96	10/16/96	0.7	Rensselaer
	5/26/96	10/28/96	0.8	Genesee
Buckwheat	6/16/95	8/8/95	1.8	Genesee
	5/26/96	7/12/96	0.7	Tompkins
	6/24/96	8/15/96	1.1	Tompkins
Japanese Millet	5/26/96	8/8/96	1.2	Tompkins
	6/24/96	7/12/96	1.5	Tompkins
	7/19/96	8/15/96	2.6	Tompkins
	6/9/96	10/3/96	1.5	Genesee
Sudex and Sudangrass	6/9/96	10/3/96	1.4	Genesee
	7/11/96	10/16/96	20.0	Rensselaer
	6/24/96	8/15/96	1.8	Tompkins

Table 2. Fall and Winter Cover Crops: Results from Selected Trials (on-farm and research trials). Data provided by L. Stivers and J. Mt. Pleasant.

Cover Crop	Date Planted	Date Sampled	Aboveground Biomass, tons dry matter /acre	County
<i>Overwintering Species:</i>				
Hairy Vetch	9/10/95	11/8/95	0.7	Genesee
Ryegrass, Perennial	8/20/92	12/92	0.9	Tompkins
	9/15/92	12/92	0.1	Tompkins
	9/10/95	11/8/95	0.2	Genesee
Rye	8/20/92	12/92	0.8	Tompkins
	9/15/92	12/92	0.4	Tompkins
	9/10/95	11/3/95	0.6	Genesee
Hairy Vetch plus Rye	9/10/95	11/8/95	0.8	Genesee
	9/10/95	5/6/96	1.4*	Genesee
<i>Non-overwintering Species:</i>				
Oilseed Radish	8/25/93	11/10/93	1.9	Genesee
	9/3/94	11/19/94	2.2	Genesee
Yellow Mustard	8/25/95	10/18/95	1.3	Genesee
	8/25/93	11/10/93	2.0	Genesee
Brassica juncea cv. Forge	8/25/95	10/18/95	1.2	Genesee
	8/27/96	11/4/96	1.2	Orleans
Brassica nigra cv. Sparta	8/27/96	11/4/96	1.2	Orleans
Oats	9/3/94	11/19/94	1.8	Genesee
	9/16/94	11/19/94	0.8	Genesee

* 1.33 tons/acre rye plus 0.1 tons/acre vetch.