

"Final Project Report to the NYS IPM Program, Agricultural IPM 2003-2004."

1. Title:

Continued Evaluation of Fall Planted Broad Leaf Cover Crops on Muck Soils

2. Project Leader(s):

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3. Cooperator(s):

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4. Type of grant:

Cultural methods; sanitation; physical controls

5. Project location(s):

This work occurred in Orange County. These results could be applied throughout the Northeast.

6. Abstract:

Many onion fields have been in continuous, unbroken production for decades. Insect and disease populations build up when no rotation is employed. Over the last few years, onion bulb mites have increased as a problem. Some growers suspect mites over-winter on the traditional grass cover crops of oats and barley. In 2001, we planted and evaluated five different fall planted broad leaf cover crops. The fall planted covers we looked at were annual crimson clover, field peas, yellow mustard, hairy vetch and buckwheat. Two growers in the onion growing region of Orange County and one grower from Oswego participated in those trials. Fields were one acre, divided into one-fifth of an acre plots. We evaluated ease of establishment, root depth and bio mass. Growers were favorably impressed with the yellow mustard and the field peas. Yellow mustard for its quick establishment and field peas because it continued growing well into winter and established a dense ground cover. For 2002, three growers fall planted fields with the five different fall cover crops. Unfortunately, for various reasons, none of the fields were planted in the spring to seed onions and field evaluations could not be carried out

7. Background and justification:

Onions are a high value crop. Many fields in Orange County have been in continuous, unbroken onion production for 50 years or more. Growers agree there is a need to find a rotational crop to break the insect and disease cycle. There are approximately 6000 acres of muck onions grown in Orange County. With the fear that bulb mites over-winter on the traditional fall cover of barley or oats, many onion growers are not planting fall cover crops. This leads to soil loss from wind erosion. Sorghum sudangrass (Sudex) has been evaluated in rotational studies, but not all growers feel sudangrass is the answer for their operations. We have looked at lettuce, spinach and potatoes as rotational options but alternate crops do not fit into many growers production capabilities. Growers know onions always grow better after any rotation. Onion vigor is increased, stand counts and yields are higher in rotated fields. There is no one "silver bullet" answer for all growers.

The disease and insect cycles need to be broken by some crop and the reason annual crimson clover, field peas, yellow mustard, hairy vetch and buckwheat were selected for evaluation is because they each have strengths. There may not be a "silver bullet" rotational cover but by looking at different cover crops, it is possible a specific crop may work for a specific grower.

Field trials from 2001 gave encouraging results. Field peas, yellow mustard and barley established quickly and produced good cover growth. It was felt the hairy vetch and clover needed more time to establish. An earlier planting date is needed for these two cover crops and may not be suitable for post onion harvest planting.

A fear by growers was yellow mustard would become a weed in their fields. This proved not to be the case at all. Mustard needs long days and cool temperatures to flower. By planting in the fall, neither of these conditions are present.

One of the hopes of this trial was onion bulb mites would not like the broad leaf covers. Prof. Dick Straub ran trials on all the seed. In his laboratory trials, he found mites were not repelled by any of the trial crops. It is felt mites over winter on almost anything but certainly have preferences. Further studies need to be carried out to establish these preferences.

For 2003, we wanted to follow up and evaluate onion performance following the various covers. Unfortunately, neither Orange County grower planted seed onions in the trial fields planted previously in fall covers. This forced us to start from step one again. In the fall of 2002, three Orange County field were planted in the five covers with a barley check. Again, for various reasons, none of the fields were available for spring planted seed onions. Growers were able to evaluate the fall growing properties of the broad leaf cover crops none the less.

8. Objectives:

1 - To increase the onion grower's ability to make sound cultural and economic rotational crop decisions.

2 – To evaluate the effect of the fall covers on onion production. Is onion yield increased? Are stand counts higher? Are disease counts lower? Are weeds more of a problem? Is there too much trash in the field?

3 – To continue evaluation of yellow mustard, field peas and buckwheat on whole field trials.

9. Procedures:

We had planned to evaluate seed onions in the three Orange County fields which previously had the cover crop trial. Unfortunately, one grower sold the field, the second grower planted carrots and the third wanted to hold the fields out of onions to do needed soil liming and then planted greens.

We were able to evaluate for trash problems and weeds but not for stand counts, insect or disease levels or potential onion yield increases.

At the end of the summer, seed was obtained and only one new field were planted to the fall cover crops. The field was divided into six sections and planted in clover, hairy

vetch, buckwheat, yellow mustard and Sprint, a oat/field pea mix. Barley was planted as a check. Hopefully we will be able to evaluate onion production in this field in 2004.

10. Results and discussion:

Doing field research in actual grower's fields sometimes does not work out. Sometimes there are problems. On the other hand, when field research is done under actual grower conditions and by the growers themselves, results are more believable and quicker to be adopted by those growers. It is disappointing not to be able to evaluate onion production after the 2001 trial. Equally frustrating after the 2003 trial. We were able to evaluate some results and still count the trial a success in some areas.

A major fear many growers expressed is they thought yellow mustard, planted into their fields would become a weed problem. The yellow mustard we use is grown for table mustard production. It needs long days and warm temperatures to produce seed. By planting in late August or early September, we are not providing the plant with either of these requirements. There were no yellow mustard weeds in any of the trial fields. The yellow mustard acted as a good ground cover. Preventing wind blown erosion from occurring.

Even though these trials were not complete in the sense of onion evaluation. Growers saw the trials and talked among themselves about the cover crops. One large grower has been looking for a crop to rest his fields and after seeing the trial, chose the red clover. A large percentage of his farm was planted to clover. He also is hosting the trial for next year. Hopefully, he will have good results from this and this will further influence other growers to try fall planted cover crops.