

"Final Project Report to the NYS IPM Program, Agricultural IPM 2002-2003."

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):

Wayne Gurda, Joihn Cavallaro and Frank Dagele, Orange County onion growers.

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 overwinter 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 it's quick establishment and field peas because it continued growing well into winter and established a dense ground cover.

A fear by growers was yellow mustard would become a weed in their fields. This proved not to be the case at all.

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 2002, 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 2002, three Orange County fields were planted in the five covers with a barley check. Growers were again able to evaluate the fall growing properties of the broad leaf cover crops.

For 2003, we hope to continue evaluating the various cover crops and their impact on onion production.

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.

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 two Orange County fields which previously had the cover crop trial. Unfortunately, one grower planted transplant onions on his trial field and the other grower planted carrots in his trial field.

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

Seed was obtained and three new fields were planted. One acre fields were 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 these field for 2003.

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. 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. In 2002, 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. Out west, mustard is widely used in grain crop rotations, since it enhances yields of wheat and barley, and breaks disease cycles in cereal grains. With its fast establishment and low cost (\$5.00 per acre), Jan Vanderheide, the Oswego County vegetable agent feels yellow mustard has great potential as a fall cover in onion production. It is possible, in the future, growers will use drop boxes on the backs of onion harvesters, planting mustard as they go along.

The field pea plots continued growing well into the winter, establishing a dense ground cover. One grower expressed there might be a trash problem in the spring but he experienced no trash problems. Another grower wanted to use field peas this past fall as a cover crop but once he learned the cost per acre (\$150.00 per acre) he was reluctant to follow through. A third grower who I gave left over seed to in 2001 also liked the field peas. For 2002, he planted a commercially available mix – Sprint. Sprint is a mix of oats and field peas. It cost 40% less than straight field peas and hopefully will provide some of the benefits of field peas.

Interest in alternate fall cover crops is increasing. One of the growers who had a trial this year, after seeing how quickly the mustard jumped up, tried to obtain more seed directly from the supplier only to find out they had run out of seed. I supplied this grower with my remaining seed and he planted it in other fields. New ideas take time to establish. Growers are interested and beginning to see how these alternate cover crops perform. Hopefully, we will be able to evaluate the onion crop in trial fields and provide more information to growers, enabling them to make sound management decisions.