Progress Report for 2005
Submitted to SRSFC

Title: Potential of Stinger Applied in Strawberries to Injure Vegetable Followcrops

Research Proposal

Principle Investigator: Katherine M. Jennings
Department of Horticultural Science
North Carolina State University
Raleigh, NC 27695
Phone: 919-218-0077
Fax: 919-515-7747
E-mail: katie_jennings@ncsu.edu

Cooperative Investigator: David W. Monks
Department of Horticultural Science
North Carolina State University
Raleigh, NC 27695
Phone: 919-515-5370
Fax: 919-515-7747
E-mail: david_monks@ncsu.edu

Cooperative Investigator: A. Stanley Culpepper
Department of Crop and Soil Science
University of Georgia
P.O. Box 1209
Tifton, GA 37193
Phone:
Fax:
E-mail: stanley@arches.uga.edu

Objective:

1. Evaluate the carryover potential of the postemergence herbicide Stinger (clopyralid) to vegetables planted following final strawberry harvest in a plasticulture system.

Justification:

Currently, Stinger herbicide is labeled as a postemergence treatment over the strawberry row or as a row middle treatment. A question that many growers and researchers alike have pondered is what vegetable crops can be planted after final strawberry harvest when Stinger is used. No research has been conducted in this area. It is typical for a grower to plant strawberries in the fall and then plant vegetable crops in the following summer after final strawberry harvest. This trial will evaluate the effect of Stinger herbicide applied in annual strawberry to vegetable crops including tomato, bell pepper, and a cucurbit crop planted after strawberry harvest is finished.

Methodologies:

Two carryover studies were initiated in October 2005 at the Horticultural Crops Research Station, in Clinton, NC and near Tifton, GA to evaluate the potential of Stinger (clopyralid) to injure vegetable (tomato, bell pepper, and cucurbit) crops when planted after final strawberry harvest. Stinger will be applied at three rates, 0, 0.33 pint/A in the fall, 0.33 pint/A in the fall followed by 0.33 pint/A in the spring, and 0.67 pint/A in the fall, or spring. Plastic mulch was laid in the fall and strawberry plugs were planted in October. The Stinger treatments will be applied over the strawberry growing on plastic and to the middles between rows. In Spring of 2006, tomato, bell pepper, and a cucurbit will be planted on the same plastic mulch utilized for strawberries.

Following the final harvest of the strawberry plants the plots will be oversprayed with Gramoxone (paraquat) to kill the strawberry plants. Vegetable transplants will then be planted directly into the holes used for the strawberry plants at the appropriate planting times in the spring/summer of 2006. Strawberry injury ratings will be taken at least 2 and 4 weeks after application and at first harvest to determine effects of Stinger on the crop. Strawberries will be harvested several times to determine the effect of treatments on yield. Vegetable crops will be visually monitored throughout the season and harvested to determine the effects of Stinger.

Results:

A preliminary trial was initiated in 2004 and completed in 2005. On October 12, 2004 Chandler plug plants were planted on two rows(12" spacing) on a plasticulture bed. Treatments included Stinger at 0, 0.33, 0.5, and 0.67 pt/A. Treatments were applied broadcast over the bed on March 21, 2005. Visual crop injury ratings were taken approximately 2, 5, 6, 7, and 8 weeks after treatment. No visual strawberry injury was observed. Strawberry plants were harvested weekly beginning 5 weeks after treatment and continuing for 4 weeks. Stinger did not reduce crop yield and no significant differences in strawberry yield were observed. After the final harvest on May 18, 2005 all plots were sprayed twice (10 days apart) with Gramoxone (paraquat) and then mowed. On the day the vegetable crops were planted individual strawberry plants were removed from the holes in the plastic and the soil around the roots was removed and placed back in the crop hole. Six tomato (Amelia), bell pepper (Heritage), and cantaloupe (Athena) transplants were planted on 24 inch spacing in one row in each plot. Initially the transplants appeared to be unaffected by the Stinger however by mid June the leaves on the tomato and pepper plants in the Stinger treatments appeared to be small, cupped, and strapped. Tomato and pepper yield was reduced by all rates of Stinger although the tomato and pepper plants treated with 0.5 pt/A did appear to have limited

recovery. Tomatoes appeared to be more severely affected than the peppers. However the cantaloupes appeared to be unaffected by the Stinger and there were no differences in the number of melons produced.

Conclusions:

Based on this one trial it appears that cantaloupe would be a safe crop to follow strawberries sprayed with Stinger. A fall application of Stinger may result in less injury (tomato and pepper) than a spring application. This will be evaluated in the 2005/2006 season.

Impact Statement:

The preliminary study has identified cantaloupe as a potentially safe follow crop to strawberry grown in a plasticulture system treated with Stinger whereas tomato and bell pepper were injured by carryover of Stinger. However, further work is needed to verify these results. This work can also provide useful information to other states.