

Title: Evaluation of Apogee for Control of Runner Growth in Annual Plasticulture Strawberries

Report Type: Progress Final

Grant Code: SRSFC Project # 2010-13

Proposal Category: Research Outreach

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Objectives

- 1) To determine the proper application **rate** of Apogee to control strawberry runner development, while minimizing any negative effects on fruit production.
- 2) To determine the proper application **frequency** of Apogee to control strawberry runner development, while minimizing any negative effects on fruit production.

Justification and Description:

In some parts of the Southeastern U.S. fall runner development in annual plasticulture strawberries is a common, if not a perennial problem. This is especially true in the strawberry producing area of Southeast VA. Many growers in this area have to remove runners every year. Some experts suggest delaying the planting date. This would be possible for some growers, but others have other enterprises that prevent them planting later in the season. Also, transplanting at the recommended time in the fall usually results in the right amount of branch crown development in the spring. Therefore, many producers in Eastern Virginia and elsewhere are locked into a planting time that means they have to deal with fall runners.

In addition to some growers having to deal with runners every year, warm mild falls like 2007 and 2009 can result in many growers over large geographical areas having to deal with runners some years. Again, these producers are planting at the recommended time for their area. Long term forecasts are not reliable enough to make a decision to delay planting. Another issue is that plants have to be ordered several months ahead of time. The plants are ordered to arrive at the proper planting time. Some producers can't hold them for a week or two once they are received; and plant vigor can suffer even under

proper “storage” conditions. The plant growers also need to move them out so they keep production going.

Therefore, annual plasticulture strawberry producers need a tool to help them manage runner development if and when it occurs. Apogee from BASF seems to be a possible tool for managing strawberry runner development. Discussions with BASF scientists and the data from limited trialing have indicated that Apogee is effective in reducing runner development. However, there are still issues with rate and timing that need to be refined.

David Handley, Extension Small Fruit Specialist in Maine has been evaluating Apogee to reduce strawberry runner development in that area. He is using a solution of approximately 150 ppm when runners are visible from the crown (less than 1 inch long). He then uses a follow up application 2 to 3 weeks later. It would seem reasonable that such an approach would work for us in the Southeastern U.S. However, we need to determine the number of applications need in the Southeast, especially during warm falls. Also, since the per acre rate changes when application rates change, BASF has indicated that they do not want to use a ppm rate. Therefore, the appropriate rate of active ingredient per acre to control strawberry runners without creating a negative impact on fruit production needs to be determined.

Methodology

Plugs of ‘Chandler’ strawberries were planted in early September. Runner development was observed in late September. Some of the runners were already longer than 1 inch. Therefore to allow all treatments to start at the same place, all visible runners were removed (except treatment 14) prior to the first Apogee applications on September 29. Four rates of Apogee were applied at 3 different application frequencies. Please see Table 1 for the complete treatment list. The four application rates included: 0.18, 0.24, 0.30 and 0.36 lb ai/A. The three different application frequencies evaluated included: weekly, two week and three week re-treatment intervals. All of these treatments were compared to an untreated check plot. Application information is listed in Table 2.

Plots (experimental units) consisted of one (1) double row bed containing 20 plants. Experimental design was a randomized complete block with a factorial arrangement of treatments and 4 replications. The trial was located at Mann Farms in Fort Blackmore, VA.

Data collected in the fall on November 12, 2010 included: visible plant vigor, the number of runners per plant, along with runner length (inches). Subsequent yield data and runner evaluation will be collected in the spring of 2011.

Results

Results of plant vigor and runner evaluations taken on November 12 are reported in Table 3. All applications of Apogee reduced plant vigor when compared the UTC treatment. The highest application rate tended to cause the most growth reduction. However, no

significant difference was observed among application rates. Plants treated with Apogee tended to be more prostrate as compared to untreated plants.

Plants from the no runners removed and UTC plots produced the most runners (almost three times as many as most of the Apogee treated plots). All Apogee treated plots produced less than 1 runner per plant on average.

The length of the runners produced was greater from plants in the UTC plots than any of the plants from Apogee treated plots. Many of the runners produced by the Apogee treated plants were not very vigorous and would not amount to much in the spring. The average length of the runners from the Apogee treated plots were less than one third the length of those from the UTC.

Conclusions

The application of Apogee to 'Chandler' strawberry reduced plant growth, runner development and runner vigor. No difference was among the other 3 rates or 3 application frequencies.

In order to evaluate phytotoxicity and / or yield benefits, yield data will be collected in the spring.

Impact Statement

The use of Apogee on 'Chandler' strawberries appears to reduce runner development and vigor. If no negative impact on yields is observed, Apogee could be used to minimize runner development in strawberries.

Table 1. Treatment List of ‘Chandler’ strawberries treated with Apogee, 2010.

Treatment	Product	Formulation	Rate (lb ai/A)	Frequency of Application
1	UTC	---	---	---
2	Apogee	27.5% WDG	0.18	2 Weeks
3	Apogee	27.5% WDG	0.18	3 Weeks
4	Apogee	27.5% WDG	0.18	Weekly
5	Apogee	27.5% WDG	0.24	2 Weeks
6	Apogee	27.5% WDG	0.24	3 Weeks
7	Apogee	27.5% WDG	0.24	Weekly
8	Apogee	27.5% WDG	0.30	2 Weeks
9	Apogee	27.5% WDG	0.30	3 Weeks
10	Apogee	27.5% WDG	0.30	Weekly
11	Apogee	27.5% WDG	0.36	2 Weeks
12	Apogee	27.5% WDG	0.36	3 Weeks
13	Apogee	27.5% WDG	0.36	Weekly

All treatments were applied with a non-ionic surfactant at ¼ % v/v.

Table 2. Application information for ‘Chandler’ strawberries treated with Apogee, 2010.

Application	1	2	3	4
Treatments	All	2,4,5,7,8, 10,11,13	3,4,6,7,9 10,12,13	2,4,5,7,8, 10,11,13
Date	9/29/10	10/15/10	10/20/10	10/28/10
Time	5:45 – 6:00 p.m.	2:10 – 2:25 p.m.	4:15 – 4:35 p.m.	12:10 – 12:30 p.m.
Air Temp	71°F	67°F	72°F	69°F
RH	81%	50%	46%	42%
Cloud Cover	90%	20%	10%	10%
Wind Speed	0 – 4 mph	0 – 6 mph	0 – 2 mph	3 – 6 mph
Wind Direction	from West	from West	from West	from South
Soil Temp (4 inches)	81°F	66°F	68°F	71°F
Soil Moisture	Moist	Dry	Dry	Wet
PSI	60	60	60	60
GPA	40	40	40	40
Foliage	Dry	Dry	Dry	Dry

Table 3. Plant vigor and runner evaluations (December 14, 2010) for ‘Chandler’ strawberries treated with Apogee, 2010.

Treatment	Product	Rate (lb ai/A)	Frequency of Application	Plant Vigor (%)	Runner Development (no./plant)	Runner Length (inches)
1	UTC	---	---	100 a ^z	2.8 b	17 a
2	Apogee	0.18	2 Weeks	85 b	0.6 c	7 b
3	Apogee	0.18	3 Weeks	88 ab	0.3 c	5 b
4	Apogee	0.18	Weekly	89 ab	0.7 c	6 b
5	Apogee	0.24	2 Weeks	83 ab	0.8 c	6 b
6	Apogee	0.24	3 Weeks	86 b	0.4 c	4 b
7	Apogee	0.24	Weekly	89 ab	0.8 c	7 b
8	Apogee	0.30	2 Weeks	86 b	0.6 c	5 b
9	Apogee	0.30	3 Weeks	88 ab	0.5 c	7 b
10	Apogee	0.30	Weekly	88 ab	0.6 c	6 b
11	Apogee	0.36	2 Weeks	83 b	0.7 c	5 b
12	Apogee	0.36	3 Weeks	89 ab	0.7 c	7 b
13	Apogee	0.36	Weekly	84 b	0.4 c	6 b
14	No	Runners	Removed	100 a	5.0 a	18 a

^z Means within a column followed by the same letter are not significantly different at the 0.05 level of probability. Means were separated using SNK mean separation technique at the 0.05 level of probability.