SUGGESTIONS FOR THE USE OF APOGEE™ FOR VEGETATIVE GROWTH CONTROL AND FOR SHOOT FIRE BLIGHT SUPPRESSION

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Introduction

There are many factors that affect the vegetative vigor of fruit trees. Many of these are fixed at planting time while others are under the control of the grower to a greater or lesser extent. Some of these factors are soil type, variety, strain, rootstock, nutrition, training system, dormant and summer pruning, crop load and availability of water. Some of these may or may not be under grower control. However, the degree of control varies and may fluctuate not only from season to season but also during the season. Excessive vigor is deleterious in several ways including reduction in fruit quality, reduction in fruit quantity and an increase in pruning expenses. In addition, excessive vigor can directly and indirectly result in both an increased level of diseases and pests or an increased use of pesticides to control these pests. On the other hand, orchards that have a good balance between vegetative growth and fruit production can have minimal production costs per unit of fruit. However, prior to the arrival of Apogee®, growers have not had a rapid, easily used technique to reduce excessive vigor in trees.

Apogee® Research

The growth regulator Apogee™ became available for commercial use in 2000. This material has the ability to inhibit the production of active forms of gibberillic acid. Some other growth regulators can also interfere with this process but none have been labeled for food crops. Extensive research has been done on Apogee™ by several eastern pomologists including: Duane Greene, Univ. of Mass., Terrence Robinson, Cornell University, NY, Steve Miller, USDA Lab in WV, Ross Byers at VPI & SU in VA, Dick Unrath at North Carolina State University, and the author. These researchers have met annually to assess results and plan further research. It soon became obvious that several factors influenced the ability of Apogee® to control vegetative growth. One of these appeared to be the latitude of the orchard or the length of growing season of the orchard. Early in the research it appeared that more northern areas with a shorter season may need one or two sprays while more southern areas, with a longer growing season, may need lower rates but may need up to 8 or 10 applications. One overriding fact became obvious from the Apogee® research. That is, where sufficient material was applied in an appropriate manner for a long enough period, growth control was nearly assured. This is in contrast to the use of many other PGRs that can be quite variable in their response.

Benefits of Apogee® Use

The benefits that may be accrued from the use of Apogee™ include the following:

1) increased fruit color due to better light penetration of the more open canopy
2) increased productivity due to higher vigor buds inside the tree canopy
3) reduced pruning costs due to reduced shoot growth
4) reduced disease and insect control costs due to a reduced tree row volume
5) reduced fire blight in shoots due to shorter period of terminal growth
6) reduced disease control costs due to due to shorter period of terminal growth

7) reduced insect control due to shorter period of terminal growth

Some of these benefits have been documented through research and others may be only the opinion of experienced pomologists.

Pennsylvania Apogee® Recommendations

Recommendations for the use of Apogee™ vary depending on all the variables mentioned earlier, especially the latitude, inherent vigor in the block, variety, crop load and amount of rainfall. Under south central PA conditions it appears that the rates and timing shown in Table 1 should be adequate to result in good vigor control. In situations where there is abundant rainfall during the summer, especially where the crop is light, applications in July may be needed to give season long control. Fresh market growers that may accrue both reduced pruning costs and increased income from enhanced fruit quality may be the most likely to use Apogee®. Fresh market orchard blocks that have high yields per acre and that have a fruit quality problem that Apogee® may impact will likely be the orchards where Apogee® will be used first. On the other hand, processing apple growers that will not see an increase in income based on enhanced fruit quality may be more hesitant to use Apogee®. Of course, both fresh market and processing orchards may gain the disease and insect control benefits alluded to earlier.

Table 1. Suggested rate and timing scenarios to control excessive shoot growth in apples with Apogee®.

	Application timing and rate (rate in oz. per 100 gallons)[z]				
Tree vigor level	1-3 inches of terminal growth	+10-14 days	+10-14 days	+10-14 days	+10-14 days
Medium 1	5	3	3		
Medium 2	5	4	4		
High 1	6	5	4		
High 2	6	5	4	3	
Very high 1	7	4	5	4	
Very high 2	7	6	5	4	3
Crop loss 1	8	6	5	4	3
Crop loss 2	8	7	6	5	4

[z] To calculate the amount to apply per acre multiply these rates by the tree row volume of that orchard.

The per acre rate for an orchard with a 300 gallon tree row volume would vary from about 1/2 to 1 1/2 pounds per acre based on these dilute rates in oz. per 100 gallons.

Suppression of Shoot Fire Blight

Several researchers (Hickey in PA, Yoder in VA and Jones in MI) have successfully demonstrated a reduction in the incidence and/or severity of shoot fire blight. Although there has been some difference of opinion on the rate necessary to give good control it appears that two sprays at 6.0 oz/100 gallons, dilute equivalent, applied at the per acre rate based on the tree volume should give a significant reduction in the incidence and severity of fire blight in shoots. It appears that Apogee® needs to be applied 7-10 days ahead of the fire blight infection to be effective. Details to be worked out include the length of time that Apogee® reduces fire blight infections. Apogee™ does not appear to be effective on blossom blight control since this type of blight normally occurs prior to the application of Apogee®.