Effect of Certain Spray Materials on Thinning in 'Jonagold' Apple

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Introduction

With the possible elimination of certain chemical products for fruit thinning, such as carbaryl (Sevin), growers will be faced with the necessity to find effective alternatives for thinning commercial apple crops (primarily Jonagold in western Washington). Beginning in 1999, chemical thinning trials were initiated to develop an effective thinning method to replace current materials being phased out. The site for the trials is the Jonagold test block at WSU-Mt. Vernon. Additional trials of other cultivars (Gala, Jonamac, Gravenstein) were suggested in cooperating commercial orchards in Skagit County, but were eliminated due to lack of funds. Treatments in the trials were agreed upon jointly with the growers' board and the researcher, in consultation with Dr. Kathleen Willemsen, thinning specialist at WSU-Wenatchee. Funds covered plot layout, treatment applications, extensive data collection, computer analysis and reporting of the experimental studies.

Anticipated Benefits and Information Transfer:

Thinning commercial apples to reduce labor and encourage optimum fruit size for market is a crucial aspect of profitable apple production. The potential loss of current products makes a trial of the new materials important for the continuation of an effective spray thinning program. Results of research will be presented to growers and the general public, in annual reports and at meetings and field days.

Methods:

A replicated trial of several materials now available for thinning was set up in the Jonagold test block. Treatments in the Jonagold block were as shown in Table 1, below:

Table 1. Materials and treatments for apple thinning applied Spring 2001

Tmt.	Material	Rate	Timing
1	NAA 200 + Sevin XLP Plus	1 oz/gal + 1 pt/gal	Fruitlets 8-10 mm (5/23/01)
2	NAA 200	4 oz/gal	Fruitlets 8-10 mm (5/23/01)
3	NAA 200 + Sevin XLP Plus	1 oz/100 gal + 1 pt/100 gal	Petal fall (5/17/01)
4	NAA 200	2.5 oz/100 gal	Petal fall (5/17/01)
5	NAA 200	2.5 oz/100 gal	Fruitlets 8-10 mm (5/23/01)
6	NAA 200	2.5 oz/gal	Fruitlets 15-20 mm (6/7/01)
7	Ethrel + NAA 200	1 pt/100 gal+ 2.5 oz/100 gal	Fruitlets 15-20 mm (6/7/01)
8	Water control		Petal fall (5/17/01)

Treatments were replicated 4 times on 10 trees per replication, for a total of 360 trees. The date, time, temperature (average temperature during time of application), and wind conditions (average wind speed/wind direction) when sprays were applied, and the recorded precipitation the week of

application, are shown in Table 2, below. The data were taken from records of the on-site weather station (PAWS).

Table 2: Weather conditions

Date	Time	Wind MPH[1]	Temp. F[1]	Avg. Temp. F[2]	Precip. In.[3]
5/17/01 (T3, T4, T8)	5:30 - 8.00 A.M.	0	48	56	0
5/23/01 (T1, T2, T5)	1:30 – 4:30 P.M.	2 – 6	76	57	.13
6/7/01) (T6, T7)	7:00 – 9:00 A.M.	0	57	54	2.32

[1]At time of application
[2]Average temperature for 5 days following application
[3]Total precipitation for 5 days following application

Before applying the sprays, flower clusters were counted on April 11 at pre-pink (stage 3-4) and the counted area of each tree was marked. Application of the materials were made to simulate an air blast sprayer, using a backpack air blast, at a rate of 200 gal./acre based on actual Tree Row Volume. Spray was directed to deliver 80% of the spray to the upper 2/3 of the trees, or in the case of smaller, young trees a distribution of 66% of the spray to the upper half of the trees. Water controls were hand thinned about 8 weeks after full bloom. On July 17 the total number of fruits in the marked areas was counted.

Results:

The results of the thinning trial are shown in Table 3, below.

Table 3. Per cent of fruit retained after thinning application.

Tmt	Material/Rate	Timing	% Fruit Retained[1]
5	NAA 200 @ 2.5 oz/100gal	fruitlets 8-10mm	d 7.9
4	NAA 200 @ 2.5 oz/100gal	petal fall	dc 8.0
3	NAA 200 @ 1 oz/100gal + Sevin XLP Plus @ 1pt/100 gal	petal fall	bdc 8.0
2	NAA 200	fruitlets 8-10mm	bdac 8.5
1	NAA 200 @ 1oz./gal. + Sevin XLPPlus @ 1 pt./gal	Fruitlets 8-10 mm	bac 10.0
7	Ethrel @ 1 pt/100 gal + NAA 200 @ 2.5 oz./gal.	Fruitlets 15-20 mm	ba 10.0
6	NAA 200 @ 2.5 oz/100gal	Fruitlets 15-20 mm	a 11.0

[1]Percent fruit retained=number of fruit counted/number of clusters counted x5