Spray Thinning Newtown Apples

properly timed and applied, spray treatment satisfactorily thinned fruit for size and yield in trials near Watsonville

K. Uriu, O. Lilleland, and E. C. Koch

Commercial size spray thinning trials with naphthylacetamide—Amid Thin—in 1956 and 1957 indicated that the material can satisfactorily thin Newtown apples, does not injure foliage, reduces hand thinning costs and can result in a better return bloom the following year.

In 1956 a total of nine plots of 60–100 mature apple trees in the Watsonville area were spray thinned with naphthylacetamide. Spray concentrations ranged from 25 ppm—parts per million—to 60 ppm and were applied with an air blast sprayer at about 70% petal fall, when most of the petals from 70% of the flowers had fallen off.

Blossom Clusters

Before the spray was applied, five limbs per tree were selected at random, tagged and a count made of the flower clusters. Each count limb had approximately 100 blossom clusters. About 15 trees were counted in each plot, making a total of some 7,500 blossom clusters on which to base the data.

After fruit set and just before hand thinning a count of the fruits on each tagged limb was made to determine the degree of thinning accomplished by the spray. After hand thinning, another count—on the same limbs—determined how much fruit was removed by hand thinning. Results were expressed as total number of fruits per 100 blossoming clusters.

In 1957 some of the test plots were resprayed with the same spray concentrations used in 1956.

Generally, the most satisfactory thinning was obtained when the spray was applied at about 70% petal fall. However, adequate thinning was accomplished when the spray was applied within the period of 50% to 90% petal fall, which may be about a week in the Watsonville area. If the spray is applied much later the amount of thinning benefit becomes less and may result in a smaller gain in fruit size at harvest. A very late spray, especially a double spray after complete petal fall, tends to produce some pygmy apples—fruit the size of a cherry—although the amount of pygmies may not be of commercial significance.

Some thinning was accomplished with all the spray concentrations but the higher the concentrations the more the thinning. A 25 ppm spray reduced the set about 25% compared to the nonsprayed trees and a 40 ppm or a 50 ppm spray reduced the set about 40%.

A tabulation was made of the number of fruits—one, two, three, or more—on each setting spur. In all the sprayed plots more fruits set as single apples—and fewer doubles and triples—than in the nonsprayed plots. Also, the normal fruit drop on the sprayed trees was complete before hand thinning was started.

Effect of Naphthylacetamide Spray on Fruit Set

Orchard	Spray ppm	No. of fruits set per 100 blossoming clusters	Reduction in set due to spray %
A	none	109	
	25	83	24
	none	98	
	40	54	45
	60	46	53
B	none	97	
	25	72	26
	50	64	34

Fruit Left on Count Limbs by Spray and by Hand Thinning

Orchard	Spray ppm	No. fruits per 100 blossoming clusters	
		Before hand thinning	After hand thinning
B	50	64	52
	25	72	56
	none	97	62
C (young trees)	25	43	31
	none	74	47

Supplemental Thinning

One of the most important aspects in spray thinning is the degree of supplemental hand thinning done after spraying. If the spray thinning is effective, very little—if any—hand thinning may be necessary for maximum production.

Supplemental hand thinning in the 25 ppm and the 50 ppm plots in orchard *B*—as shown in the table in this column—may have been more than necessary, assuming that 62 fruits per 100 blossoming clusters in the nonsprayed plot was the desirable amount to leave after hand thinning. The 25 ppm plot definitely needed hand thinning but the 50 ppm plot might have been satisfactory without hand thinning or with only a very light thinning.

In the young orchard *C*—in the same table—the 25 ppm spray had done satisfactory thinning and hand thinning was not necessary. The customary habit of some fruit thinners to leave only one apple per spur must frequently be

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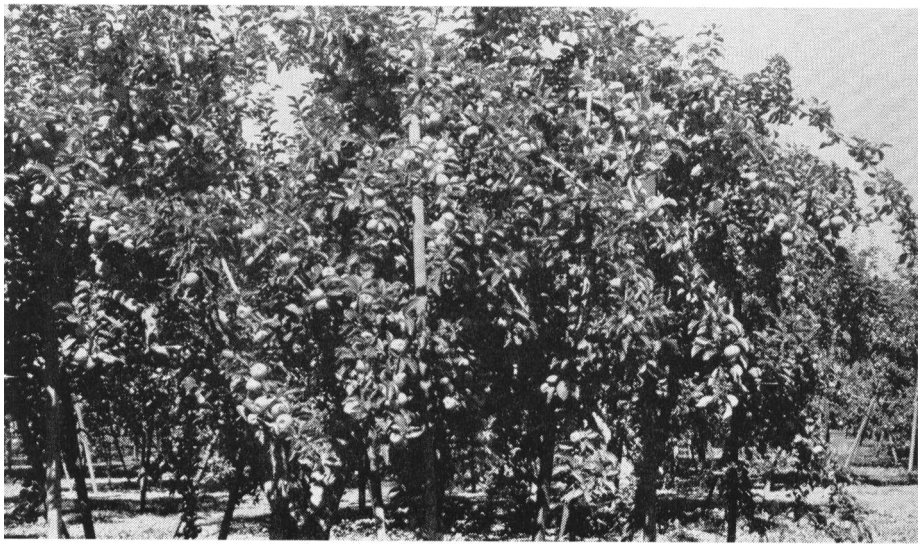
Spray thinned Newtown apple trees in an orchard near Watsonville produced a good crop and excellent fruit size.



Pelleted Alfalfa Hay

baled and pelleted alfalfa hay in comparative trial with beef steers

N. R. Ittner, J. H. Meyer, and G. P. Lofgreen

Pelleting alfalfa hay for livestock reduces the bulk and transforms the hay into a free flowing form like grain and cuts labor requirements for handling.

The chief disadvantages of pelleting are the high costs of grinding and pelleting. However, some pelleted hays are being used by cattle feeders as a range supplement, and by some sheep feeders in lamb fattening.

A preliminary study on the feeding of pelleted hay to steers was made at the Imperial Valley Field Station during the winter of 1956–1957. The test compared baled alfalfa hay to the same hay fed as pellets. Alfalfa taken from the same field was ground through a $\frac{3}{64}$″ screen and then pressured into pellets $\frac{13}{64}$″ in diameter. Chemical analyses of the hay and the pellets showed that they were essentially the same in composition. Pelleted alfalfa hay contained 21.0% protein and 7.7% lignin while the baled alfalfa contained 20.7% protein and 8.0% lignin. The estimated TDN—total digestible nutrient—value of the two forms of the hay, as made from the lignin analysis, was 60% for the pellets and 59% for the long alfalfa hay.

Two lots of three steers each were fed —free choice—both forms of alfalfa hay.

Comparative Trial
Two Lots of Six Hereford Steers Each Fed the Same Alfalfa Hay, Long and Pelleted, for 167 Days*

	Alfalfa hay	Alfalfa pellets
Av. initial weight	636	640
Av. final weight	935	1,002
Av. daily gain	1.80	2.17
Av. daily feed		
Barley	1.81	1.81
Alfalfa hay	14.02	...
Alfalfa pellets	...	17.08
Oat hay	1.76	1.59
Total	17.59	20.48
Feed/100 lbs. gain		
Barley	101	84
Alfalfa hay	781	...
Alfalfa pellets	...	788
Oat hay	98	73
Total	980	945
Dressing percent	58.7	59.8
% Carcass fat	26.4	25.7
Grade	5 Choice 1 Good	6 Choice

* All feed is on a dry basis.

In addition, each steer received two pounds of barley and two pounds of long oat hay daily. The experiment was conducted for a period of 167 days. The animals were weighed every month after an overnight stand without feed or water.

Differences were noted in the response of the animals to the two types of rations. The steers fed the alfalfa pellets gained 0.37 of a pound more per head per day than did the steers fed the alfalfa hay. This difference was statistically significant. Apparently, the main reason for the increased daily gain was the increased consumption of alfalfa fed as a pellet. Here the steers consumed approximately three pounds more hay per head per day. However, only small differences can be noted in the efficiency of feed utilization.

Carcass data indicate very little difference between lots of steers. Dressing per cent, carcass fat—calculated from the fat content of the 9th, 10th, and 11th rib —and carcass grade did show that all animals were in excellent slaughter condition.

Aside from the main purpose of the experiment, an example is also given that animals fed high quality roughages can be fattened with a minimum quantity of grain. However, emphasis must be given to the high quality of the alfalfa used.

This experiment and others show that cattle and sheep make greater gains if fed a pelleted high roughage ration. Apparently in this experiment, the increase in gain was due to the increased food consumption. This does not mean that all rations in the pellet form when fed to cattle would increase gains. Higher levels of concentrate feeding have not been tested.

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APPLES

Continued from preceding page

changed to leaving two—where possible —on the spray thinned trees if over hand thinning is to be avoided.

Time records of hand thinning labor kept by a number of growers showed that in 1956 hand thinning costs were reduced 35%–50% in the 40 ppm and 50 ppm sprayed plots.

Several tons of fruit from each plot were run over a commercial apple grader to obtain distribution of sizes.

Spray thinning definitely shifted the distribution toward larger sizes. Spray thinning reduced the percentage of ciders —2¼″ and less—and increased the percentage of fruits larger than 2⅝″.

Spray thinning evaluations should be made over a two-year period, at least. If any decrease in tonnage occurs the first year, it may be more than offset by the increased return bloom and subsequent better tonnage the second year. Return bloom counts in these tests showed that the bloom in 1957 on the check trees was lighter than in 1956. On the other hand, the sprayed trees came back with a good bloom in 1957 and had about 30% more flowers than the check trees.

Trials thus far indicate—in a heavy blooming mature orchard in the Watsonville area—that naphthylacetamide at 40 ppm or 50 ppm applied at 70% petal fall can satisfactorily thin Newtown apples. On young trees and trees of low vigor a lesser concentration is advisable.

Spray thinning—when correctly applied and followed by a judicious hand thinning—has resulted in appreciably larger fruit sizes, approximately equal total yields, and greater monetary returns.

Grader Results of a Heavy Crop Orchard, 1956

Treatment	Per cent of total weight			
	2¼″ and less	2¼″ to 2⅝″	2⅝″ to 3″	over 3″
60 ppm. No hand thinning	8	48	40	4
40 ppm. No hand thinning	12	53	33	2
Check. Hand thinned	19	56	24	1
40 ppm plus hand thinning	8	47	40	5

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