Conclusions

- Cereal straw can be fed as a major portion of a growing ration with little if any energy available for production (NE_g).
- Better growth can be obtained when cottonseed meal rather than urea is used as a nitrogen source to supplement straw.
- A least-cost program will result in a least-cost ration for a given set of specifications and feed prices. However, the least-cost ration does not ensure least-cost gain.
- More work is necessary on feeding cereal straws, especially on factors affecting intake and net energy values.
- No carryover effects due to feeding straws were evident during a fattening phase.
- Although straws may be low cost, the inclusion of them in a ration for production may not be least cost.

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Chemical defoliation of fruit trees

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Trees in most mature peach, nectarine, and plum orchards in the southern San Joaquin Valley cease growth by early to mid-October. Because the foliage often persists on the trees for another three to five weeks and interferes with the pruner's vision, it is impractical to start annual pruning immediately. Thus, any means of stimulating defoliation in mid-October that would allow an earlier start on pruning could become an important factor for progressive farm labor managers. Under normal conditions, many farm laborers are idle from mid-October through mid-November, because harvest of most other crops is nearly completed. The availability of defoliated trees by mid-October would provide work when the unemployment rate is high and would extend the period over which dormant pruning could be accomplished.

Chemical defoliation tests were conducted in 1972, 1973, and 1974 in Tulare and Fresno counties. Defoliants that looked promising in fruit-tree nursery-stock defoliation tests and those used commercially on cotton, alfalfa seed, and sorghum were selected.

In late October of 1972, ethephon, biuret, zinc sulfate, paraquat, sodium chlorate, Folex, and zinc sulfate plus oil were applied as dilute sprays on plum and nectarine trees. Within one week, plum trees sprayed with ethephon, biuret, and sodium chlorate were almost completely defoliated. Nectarine trees were not defoliated as readily, but the same three materials caused greater response than the other compounds tested.

All treatments were evaluated in the following spring for their residual effect on fruiting wood, flower buds, and shoot development. Blooming of flower buds was delayed two to three days by the biuret treatments and three to five days by the ethephon treatments. There were no adverse effects on crop set. Results of trials in 1973 and 1974 to delay flower opening, and thus provide better bloom overlap between early blooming Red Beaut plums and later blooming pollinators, were inconclusive. However, indications were that a short delay in Red Beaut blooming period did not influence the amount of fruit set. Sodium chlorate treatments resulted in excessive killing of flower buds.

In 1973, D-WK (DuPont-WK surfactant, active ingredient dodecyl ether of polyethylene glycol) was added to the test chemicals; other compounds found to be less promising in the 1972 trials were eliminated from further testing. D-WK and ethephon were used alone, and D-WK was also combined individually with ethephon, zinc sulfate, and sodium chlorate.

After eight days, both plum and nectarine trees were extensively defoliated; the more effective treatments were D-WK, alone and in combination with zinc sulfate. Flower bud evaluations the following spring showed no difference in bloom density or crop set between trees receiving these treatments and control trees. Trees treated with ethephon were again delayed in bloom, and those treated with sodium chlorate sustained flower bud injury.

In 1974, treatments on nectarine and peach trees included D-WK at ½ and 1 percent by volume, zinc sulfate at 10 pounds per 100 gallons of water, and zinc sulfate at 5 pounds per 100 gallons of water plus D-WK at ¼ percent. A fifth treatment of ethylene glycol from commercial antifreeze was also included. Five days after spray application, all treatments were rated before and after passes were made through the test blocks with a commercial dilute sprayer using only the air fan. D-WK at 1 percent, zinc sulfate at 10 pounds, and zinc sulfate at 5 pounds plus D-WK at ¼ percent induced good defoliation (see table). No adverse effects attributable to treatments were noted the following season.

During the three years of tests, it became apparent that all defoliants had less effect when applied later than mid-October. This is probably a result of lower activity and uptake by the leaves and trees. A good example is Armking nectarine, which grows later into the season than Independence; the former was more easily defoliated than the latter (see table).

Although D-WK was effective in these tests, the chemical is not registered for use as a defoliant on fruit trees. Zinc sulfate, often used in fall nutrient sprays, provides defoliation but has sometimes caused gumming of lower fruit wood on peaches and nectarines.

DEFOLIATION OF TWO NECTARINE VARIETIES FROM CHEMICAL SPRAYS*

Treatment	Percent defoliation			
	Armking		Independence	
	Before blow	After blow	Before blow	After blow
D-WK, 1%	96†	100	27	90
D-WK, ½%	53	98	12	57
Zinc sulfate, 10 lb/100 gal water	82	99	27	65
Zinc sulfate, 5 lb/100 gal water, + D-WK, ¼%	80	99	12	60
Ethylene glycol, 1%	5	20	1	8
Check	0	5	0	5

* Applied October 17, 1974; rated October 22, 1974, before and after passes through test blocks with commercial sprayer using air fan only.

† Average of three replications.

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