

# Abscission

## chemical control of shedding or dropping of plant parts

W. S. Stewart

*The following report is a condensation of a paper presented before the 17th Annual Winter Meeting of the Western Society of Naturalists.*

**Abscission**—the shedding or dropping of plant parts such as leaves and fruit—can be delayed or hastened by chemical treatment. From the grower's point of view, the control of this drop is of extreme importance.

The practical effective delay of abscission by chemical means was discovered about 10 years ago. The plant growth regulators available at that time were of the indole or naphthalene type—such as indole-acetic acid, naphthalene-acetic acid and naphthalene acetamide.

### Application

To reduce the drop of apples and pears growth regulators usually are applied as a water spray three weeks to 10 days before anticipated drop. Earlier applications are less effective, while those made after drop has begun are of little value.

Minute amounts are required and spray concentrations of 10 parts of chemical per million parts of water are considered standard. The regulators also may be applied in dust form although results with this type of application are not successful in the arid northwest.

For fruit drop control the maximum distance possible between the tissue re-

effectively delays preharvest drop of Winesap and Stayman-Winesap apples. It is so effective on these two varieties that it may be applied more than three weeks in advance of the anticipated drop, allowing apple growers to combine the 2,4-D with the final spray for codling moth control.

Preharvest drop of pears also may be delayed with plant growth regulators.

Apples and pears which have been prevented from dropping should be picked as nearly as possible during the normal harvest period, otherwise they will continue to ripen on the tree and will have a decreased storage life when finally harvested.

Preharvest fruit drop on citrus and the leaf drop which often follows an oil spray for pest control is under study at the Citrus Experiment Station.

By delaying abscission layer formation, 2,4-D sprays may actually be used on citrus to store citrus fruit on the trees since these fruits do not break down on ripening as fast as apples and pears.

Other benefits derived from delaying abscission of citrus fruits are the reduction of fruit-stem die-back and the decrease of black button formation during storage.

In oranges it was found that 2,4-D prevented flower abscission for several months but did not ultimately increase fruit-set since only the usual small percentage of mature fruits developed from these flowers.

Fruit-set of tomatoes may be induced by the use of plant growth regulators. These chemicals seem to function—at least in part—in this case by preventing abscission of the flowers. After treatment, the ovary may enlarge even without pollination. This treatment has come into commercial use in hothouse-grown tomatoes where it is possible to treat individual flower clusters.

These sprays may cause injurious leaf formations on tomatoes and have not come into commercial field use because of the difficulty of treating only blossom clusters and not the leaves.

Probably the most widespread use of abscission-hastening chemicals is to accelerate defoliation.

### Cyanide Compound

The most generally used defoliant are cyanide compounds such as cyanide and sodium acid cyanide. Cotton, potatoes, peppers, tomatoes, ramie, and soybeans are among crops commercially defoliated.

Defoliation facilitates harvesting the crop and may be desirable—as with potatoes—to reduce the entrance of rotting organisms.

In practice, defoliants may be applied in dust or spray form.

Among the advantages claimed for chemical defoliation of cotton are: hastens maturity, eliminates boll-rot, reduces rain loss, speeds hand and mechanical picking, improves grade by eliminating trash, allows pickers to start earlier in the morning and permits earlier fall cover crop planting.

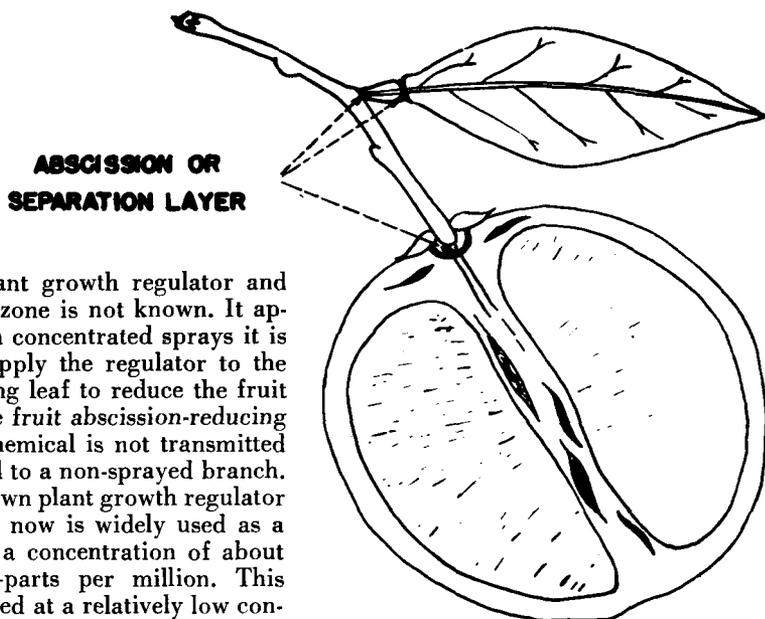
On cotton the cyanamid is usually applied 25 to 30 days after *cut out*—the time at which the last bolls are set that will make seed. The length of time between application and leaf drop varies from five to 10 days depending on weather conditions and the condition of the plant.

Since heavy foliage can be controlled by defoliation, growers may increase the amounts of fertilization and irrigation water used and thereby increase acre yields.

Plant growth regulators must be applied cautiously, as excessive amounts of defoliant are known to produce such a sudden cell-shock that all cellular activity is abruptly stopped before the abscission layer is formed. No defoliation will occur under this condition and the leaf will cling to the plant and be a source of leaf trash during harvesting.

Uniform distribution of the defoliant

Continued on page 15



ceiving the plant growth regulator and the abscission zone is not known. It appears that with concentrated sprays it is necessary to apply the regulator to the third subtending leaf to reduce the fruit abscission. The fruit abscission-reducing effect of the chemical is not transmitted from a sprayed to a non-sprayed branch.

The best known plant growth regulator is 2,4-D which now is widely used as a weed killer at a concentration of about 1,000 p.p.m.—parts per million. This chemical, applied at a relatively low concentration—between five and 10 p.p.m.—

# Swine Production

## development of bacon-type hog considered by California growers

E. H. Hughes

Before World War II there was an inclination on the part of all producers of swine in California—purebred breeders, the commercial hogmen and the garbage feeders—to settle on a uniform type.

During the war, when fats were needed and pork tonnage was desired, there was a tendency among pork producers to market their hogs at heavier weights and, in some instances at least, to select for the wider, thicker kind of hogs.

Toward the end of the war and shortly after V-E day those people who were looking toward the future called attention to the fact that lard had many competitors and that there would soon be surpluses of this produce. In other words, they were saying that we should market our hogs at lighter weights and that we should be careful not to select brood sows that are too short and thick and heavy in the jowl. Some producers heeded the warning while others did not.

In California most producers have what might be called the middle-of-the-road type which is a brood sow with some length and width, strong legs and depth of side and with indications of superior udder development.

The progressive hogmen, including the purebred breeders and commercial producers alike have been selecting boars that show masculinity, ruggedness, without too much coarseness, yet having considerable depth and fulness of ham, medium width of back and loin, with deep sides and without too much jowl.

The offspring of such animals, if properly nourished, should grow rapidly and be ready for market at ages that will vary from six to nine months of age, weighing from 190 to 230 pounds. These fat hogs should yield from 75% to 79% if killed "shipper style."

Such market hogs, if they are of the proper type, should provide hams of the

proper weight, bellies that are thick enough and have considerable lean with the fat. The pork loin should be excellent and the shoulders, when properly processed, should meet the demands of the consumer. The carcasses from such pigs should have a back fat of about 1 $\frac{5}{8}$  inches in thickness.

There is some discussion among producers and others on the Pacific Coast about attempting to produce a bacon-type hog.

Generally speaking, bacon hogs are more expensive to produce than the so-called meat-type hog. More protein is required in the diet to produce bacon hogs.

### Possible Development

There has been some discussion as to whether new breeds should be brought in or whether the breeds now here might, by selection, be developed into a type of hog suitable both for the producer and consumer.

Excessively fat hogs are not needed, nor are hogs with heavy jowls. What is needed, are hogs that will provide carcasses with a relatively high percentage of muscle to fat and yet of a kind which will yield a high percentage of fat when slaughtered.

*E. H. Hughes is Professor of Animal Husbandry and Animal Husbandman in the Experiment Station, Davis.*

Wood pocket lesion on semidense Lisbon branch.



### LEMON

Continued from page 12

healthy lemon scions indicates either the presence of a virus or a toxin in the diseased tree affecting the growth of the scion. Further evidence is needed to determine the exact nature of this disease.

All known cases of wood pocket can be traced back to a semidense strain of Lisbon lemon in one orchard near Corona. Considerable numbers of this strain were distributed before it was known to carry wood pocket.

It is highly important that any further propagation of trees from this semidense strain of Lisbon lemon be avoided. It is also important that, unless and until this disease is proven not to be due to a virus, none of these trees be topworked with any citrus that would be used for seed purposes, and that no growth from the rootstock of any diseased tree be used for seed purposes. So far as we know, this disease spreads only through buds, scions or seeds and does not spread from tree to tree in the orchard, but the possibility of its spread by some other means must not be overlooked.

Because it is impossible to locate and eradicate all lemons affected by wood pocket, it is advised that growers control the disease by avoiding further propaga-

tion of this semidense strain of Lisbon and by removing diseased trees as soon as they become unprofitable.

*H. S. Fawcett is Professor of Plant Pathology, Emeritus, and Plant Pathologist in the Experiment Station, Riverside.*

*E. C. Calavan is Assistant Plant Pathologist in the Experiment Station, Riverside.*

### ABSCISSION

Continued from page 6

is essential since the chemical affects only the leaves on which it is applied and not the plant as a whole.

Abscission-hastening compounds also are effective in blossom thinning of fruit trees. While this work still is largely experimental, research has shown that results are best when the center blossom is open and pollenized, and then sprayed before the remainder of the cluster is pollenized.

Blossom-thinned trees appear to bear a higher proportion of marketable size fruit than do nonthinned trees. Blossom thinning in apples promotes annual bearing in biennial varieties. Occasionally severe foliage injury has occurred but no serious after effects have been noted.

*W. S. Stewart is Associate Plant Physiologist in the Experiment Station, Riverside.*