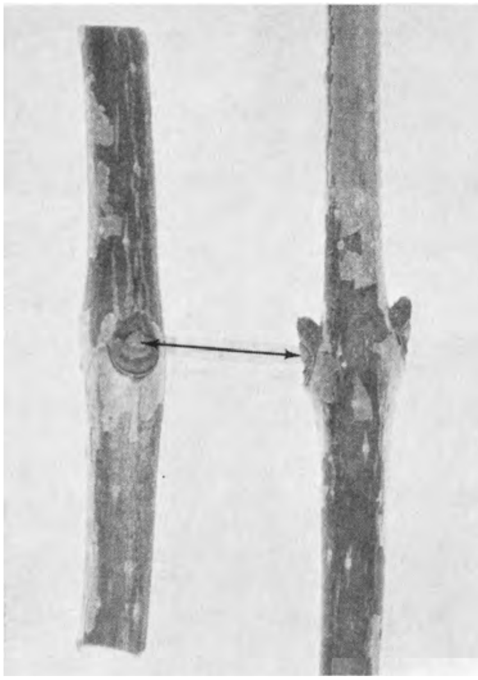


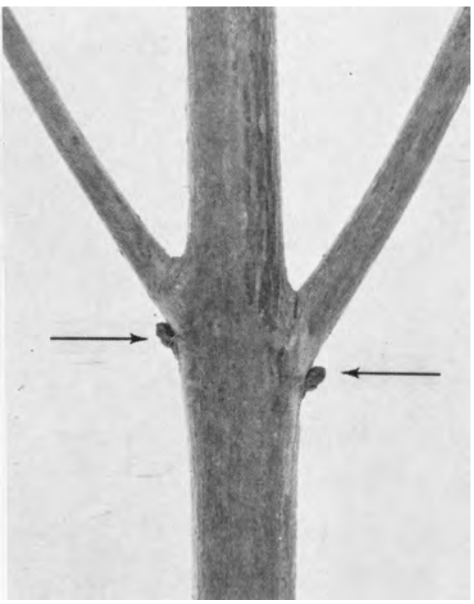
Right—one-year-old shoot showing large primary buds and smaller secondary buds (arrows).

Strong Branch Structure

FOR MODESTO ASH

a simple pruning technique can insure a stronger branch structure for Modesto Ash trees

R. W. HARRIS · L. BALICS



Above—one-year-old shoot showing lateral branches which grew from primary buds. Lower secondary buds indicated by arrows.

MODESTO ASH (*Fraxinus velutina* 'Modesto'), often used as a landscaping tree in California, tends to form sharp-angle attachments between the lateral branches and the main trunk. As the branches and trunk increase in diameter, bark becomes imbedded in these sharp-angle crotches, thus impairing the strength of the attachment of the branch to the trunk. As the tree matures, reaching out to 30 feet high and wide, the weight of each branch creates a tremendous strain at the branch-trunk union. Serious splitting off of branches is occurring with many Modesto Ash trees because of this inherent weakness of the branch-trunk union.

Attempts to influence the angle of attachment of branches to the trunk have been unsuccessful. In one study, the bark on one-year-old trunks was notched above some lateral buds and below others. Some of the cuts through the bark were treated with 1% indoleacetic acid. None of these treatments altered the angle of attachment of shoots growing from these buds.

Investigation revealed that the Modesto Ash has so-called superposed buds; that is, the larger, primary bud is above a smaller secondary bud at each node. The secondary bud seldom grows unless the primary bud or the shoot growing from it is damaged or removed.

In working with these trees, it was observed that the branches forming sharp-angled crotches grew from the primary buds. On removing the lateral branches arising from them, the seondary buds grew, forming almost right-angled crotches with the trunk. Having started

Right—one-year-old shoot with lateral branch with wide angle of attachment which grew from secondary bud after lateral branch from primary bud was cut back. Stub left to show sharp angle of attachment of lateral from primary bud.

Below—four-year-old trunk showing typical sharp angle attachment of lateral branch growing from primary bud.

growth later, the branches from the secondary buds were smaller than those growing from primary buds. Although this somewhat slowed the total growth of the tree, branch structure was strengthened. Branch attachment is stronger where the branches are smaller than the trunk.

Further studies are being made to determine the best pruning pattern to follow but this preliminary report offers nurserymen, landscape horticulturists, and the public one simple solution for averting a dangerous branch structure in the Modesto Ash.

Above—six-year-old tree showing angle of attachment of lateral branches growing from secondary buds after removal of sharp-angled branches from primary buds. Street tree in Modesto.

Unfortunately, nothing can be done to increase the angle of attachment once a limb has formed. On older trees, thinning out some limbs on the main branches, particularly near the ends of the branches, will decrease both the weight of the branches and their wind resistance. The branch attachment also will be strengthened by this practice since the branch will grow more slowly in relation to the trunk.

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DIATOMACEOUS EARTH CONTROLS INSECTS IN WHEAT SEED

Diatomaceous earth (silicified remains of microscopic algae) was effective in protecting grain seeds against insects in recent tests, and it was concluded that more extensive trials should be undertaken.

These laboratory tests were made in a study to determine the relative effectiveness of dosages of diatomaceous earth proportional to 4, 6, and 8 pounds per ton of grain in preventing or controlling insect infestations in wheat seed. Effectiveness of treatments was tested against the rice weevil, *Sitophilus oryzae* (L.), the granary weevil, *Sitophilus granarius* (L.), the lesser grain borer, *Rhyzopertha dominica* (F.), the confused flour beetle, *Tribolium confusum* Duv., the saw-toothed grain beetle, *Oryzaephilus surinamensis* (L.), and the flat grain beetle, *Cryptolestes pusillus* (Schönh.).

Tests were made under constant conditions of 80° ± 1° F. and 60% ± 5% relative humidity. Untreated control samples of wheat were completely riddled by the end of 6 months after initial exposure to insects. Four pounds of diatomaceous earth per ton of grain prevented infestations for six months, and 6 pounds per ton lasted 9 months. The 8-pounds-per-ton treatment was still effective when the experiment was terminated 12 months after treatment of grain and initial exposure to insects.—*R. C. Strong, Associate Entomologist, University of California, Riverside.*

GUIDES TO NITROGEN FERTILIZATION OF SUGAR BEETS

Sugar beets, as a crop, require large amounts of nitrogen to produce high yields of roots. If grower and processor are to receive a high return for the crop, a high sugar content must also be obtained. Rapid growth and high sugar content are not compatible, however, since growth must be reduced by low night temperatures and a gradual depletion of available nitrogen before sugar accumulation takes place. As a consequence, the estimation of the nitrogen fertilization requirements of sugar beets is a key point in crop management.

Since soil analysis procedures have not proved adequate for estimating nitrogen needs, plant analysis procedures involving the nitrate content of leaf petioles have been developed. With soils low in residual nitrogen, these plant analysis procedures will accurately predict the occurrence of nitrogen deficiency and fertilization can be controlled to provide an optimum period of 40 to 60 days of deficiency just before harvest. However, with soils of high residual fertility, the crop may continue to receive 80 to 90% of the nitrogen needed for maximum root growth while appearing deficient visually and by tissue analysis. Under these conditions the optimum length of the deficiency may involve as much as the last 90 to 150 days of the growing season.

Current research is aimed at developing tools to evaluate the degree of nitrogen deficiency. Three aspects of the problem are being attacked: (1) new tissue analysis procedures involving other plant tissues and other forms of nitrogen are being investigated; (2) pot studies are being conducted to evaluate the responses of sugar beets to intermediate levels of nitrogen and to determine how these responses are influenced by climate; and (3) a statewide series of field trials is being conducted to inventory the types of nitrogen responses now being obtained and to assess the utility of various plant analysis procedures.—*R. S. Loomis and F. J. Hills, Department of Agronomy, University of California, Davis, and Albert Ulrich, Department of Soils and Plant Nutrition, U.C., Berkeley.*

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