

# Nitrogen Sprays

## tests reported with fertilizer containing 44% organic nitrogen

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**The use of a spray** to supply nitrogen to the aboveground parts of trees was re-examined in 1950 because of the results obtained by various investigators in other states.

Trials in 1944 with urea on peaches, apricots and Japanese plums did not prove successful. No response was obtained on any of these, even with very deficient peaches where up to six applications at the rate of five pounds of commercially prepared material—Nugreen—containing 44% organic nitrogen per 100 gallons of water were made. These trials all received their first spray in May, when abundant foliage was present. Results on apples tested at Cornell indicated that earlier timing was desirable.

In 1950 plots of sweet cherry, apricot, peach, almond, and apple were laid out, sprayed, and the results observed. Observations were made also on fig and walnut trees sprayed on the initiative of cooperating growers.

Each of the stone fruits and the apples dealt with last year were sprayed at about petal fall, and subsequently at different times for the different species.

The sweet cherries received a second spray on some trees; the other stone fruits up to three applications. All were made at the standard rate of five pounds per 100 gallons. There were no rains sufficient to carry any into the soil even for the earliest blooming sort, the almond. Leaf samples were taken at intervals, washed and analysed for total nitrogen.

The apples behaved in the same manner reported by several men in other sta-

tions. A marked deepening in the color of the leaves followed spraying. Since this was the first season of trial and the fruit buds were already formed, blossoming was not affected. The trees were thinned to about the same crop. There was no delay in maturity on either the Gravensteins or Golden Delicious used in these trials. Gravensteins were sprayed in three orchards and Golden Delicious in one. There was much less response in color in the latter variety, side by side with the first.

The stone fruits all failed to respond. No effect could be seen on any of them except that there was slight tip burn on the almond after the second spray. The necrotic tissue separated cleanly from the remaining healthy tissue after about a month. The remainder of these injured leaves stayed on the trees and could be identified by the truncated ends throughout the season.

Figs of the Kadota, Calimyrna and Adriatic varieties at Merced were sprayed and showed visible benefit in leaf color and in the rapidity of recovery from a spring freeze.

Walnuts at Linden sprayed with 10 pounds of a 44% organic nitrogen preparation per 100 gallons, soon after shedding of pollen, were severely injured. The young leaves and growing terminals were burned and every nut shed.

Olives in Tehama County in tests initiated by the farm advisor showed a marked response to the spray in amount and size of fruit on limbs both girdled and sprayed, compared with those only

girdled. Ungirdled limbs produced much less and smaller fruit whether sprayed or not, and there was no improvement in either character by spraying. There may have been a slightly adverse effect.

The peach, the apricot, the apple, and the almond—but not the sweet cherry—will absorb zinc from foliage sprays in sufficient amount to correct deficiency symptoms. The walnut does not absorb zinc readily. There is no correlation between the ability of a species to absorb zinc and its ability to absorb urea. The factors which control the absorption of materials sprayed on the foliage should be investigated.

The results obtained here with stone fruits check the reports of investigators working with peaches in New York, Maryland and Georgia in the eastern section of the United States. It would appear that application of urea as a spray has a place as a supplement to or as a replacement for the standard method of soil application for apples. It has been shown by workers at Cornell and elsewhere to be a more efficient method of use, pound for pound of actual nitrogen, and the response is much more rapid than application to soil. Since it can be included with other materials which will be sprayed in any case, cost of application is negligible. It should be possible to regulate the nitrogen status of the tree more accurately than is possible by soil applications alone.

The use of a 44% organic nitrogen preparation as a spray seems to have some possibilities for figs, olives and walnuts, although these trees should receive more attention before recommendations as to practice can be given. There seems to be little place for it in the orchards of stone fruits of the species tried to this time.

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## PLANTER

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Another method of controlling the plant competition would be the removal of the seeds or plants of the resident annuals from the surface soil by means of scraper blades at the time of seeding the perennial species.

The new range planter was developed by the Divisions of Agronomy and of Agricultural Engineering to scrape away the unwanted plants, drill the seed of the perennials into the ground, and apply fertilizer to stimulate early seedling growth.

The experimental planter was a two-

row machine with scraper blades mounted to clear one-foot wide strips ahead of the double-disc furrow openers of the drill. Fertilizer hoppers were mounted on the unit to feed into the furrows. Drag chains behind the openers covered the seed lightly.

The drill, which had a fluted-wheel type of feed, was adjusted to meter out 10 pounds of rice hulls per acre. This was done so different rates of seed per acre or different mixtures could be applied without requiring calibration for each grass and legume species or mixture.

Experimental seeding rates were low. A mixture made up of one half pound Harding grass, one half pound Subclover,

one half pound nodding stipa, one quarter pound Rose clover, and one quarter pound alfalfa mixed thoroughly with 10 pounds of rice hulls to seed an acre, gave—by count—an average of about 15 seeds per linear foot of row. This mixture would cost about \$1.90 per acre.

The efficiency of the planter in scraping the area clean and drilling the seed into the ground depends a great deal on the type of soil and the weight and strength of the machine. On the hardest and most compacted soils the disc furrow openers of the light experimental planter could do little more than form shallow grooves in which the seed and fertilizer

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