M. V. BRADLEY and J. C. CRANE

Adverse effect of gibberellin on Bud Development in some stone-fruit plants

Gibberellin stimulates flowering of many plants, under appropriate conditions, but certain concentrations of gibberellin sprayed on branches of some stone-fruit trees at full bloom or at the beginning of pit-hardening retarded development of flower buds. At higher concentrations, vegetative buds as well as flower buds were inhibited. The year following the spray applications, those branches that had received the higher dosages were devoid of flowers or leaves except, in some cases at the tips of the long shoots, on regions which had apparently developed after gibberellin treatment. The terminal buds on the new growth were relatively immune to the adverse effects of gibberellin, while the lateral buds suffered such severe growth inhibition that recovery was impossible. That gibberellin did not inhibit growth in general was evidenced by the excessive length and diameter growth of stems and petioles while lateral bud growth was restricted. The higher the dosages, the more extreme the stem and petiole growth and greater the blocking of bud development.

From study of sections of buds collected five months after treatment, the basic effect of gibberellin was concluded to be inhibition of cell division in bud apices. The normal assortment of bud scales and leaf primordia therefore were not formed in vegetative buds and those that had begun development eventually disintegrated. In buds which normally would have been flower buds, not only was bud scale formation restricted but primordial flower organs had never begun to develop.

Variation in sensitivity to gibberellin concentrations appeared among the five species of stone fruits studied. In the Fay Elberta peach, two applications a week apart of a 500 milligrams per liter—mg/l—concentration had no effect on vegetative or flower buds. In the Royal apricot, Jordanola almond, and President plum, two applications of 50 mg/l completely inhibited flower bud development, and two applications of 250 mg/l concentration were required to inhibit vegetative buds. The Bing cherry was intermediate in its response.

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APHIDS

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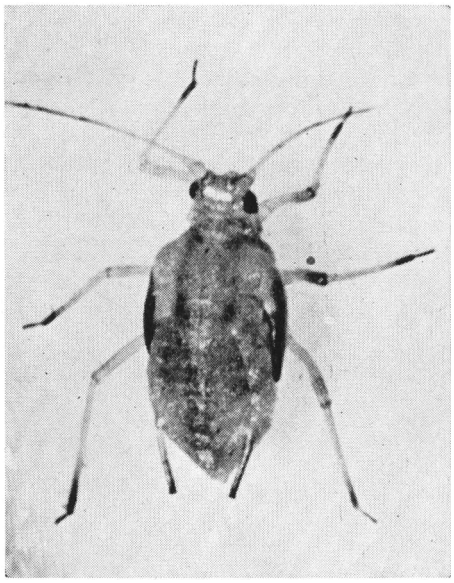
plant recovery and minor damage to the seed crop. The average ratio of beetles to green peach aphids was 1:5 in light infestation and 1:12 for bean aphids. When the mean ratio of beetles was 1:9 for green peach aphids and 1:23 for bean aphids, or 1:32 for both species, the beet plants suffered moderate-to-severe damage.

When the first two ratio counts were made—in April—the beetles were preponderantly in their larval stage. The increase in numbers of aphids observed in the fourth count—on May 13—was related to a maturing of the beetle population. On May 13, adult beetles were more abundant than the larvae, which are known to be more effective in controlling aphids.

These preliminary studies indicate that the ratios of ladybird beetles to aphids should be high when beet plants begin to bolt during April and May, in order to prevent extensive crop damage by aphids.

Aphid Flights

Five aphid traps were operated in the untreated part of the field under observation, to determine the duration and intensity of the major flights of the two species of aphids during the growth period of the beet seed crop. The traps were enamelware pans filled with a dilute aqueous solution made yellow by potassium chromate—yellow is attractive to aphids—and were sunk to half-depth in the soil, at intervals along central untreated plant rows. Trapped aphids were collected at weekly intervals and the numbers of each species were totalled for the five traps.



An adult green peach aphid.

The migratory flights of the aphids began during the latter part of October and ceased during the winter months. The incoming winged aphids established colonies throughout the beet field. Flights were resumed in March and continued until the end of June.

Green peach and bean aphid flights nearly coincided in duration and periods of peak migration. During the fall flight period, the green peach aphids were more abundant except in October. In the spring flights, winged forms of both aphid species were almost equally abundant. However, there was a noticeable preponderance of bean aphids in May. The heaviest flights of both species occurred after the populations of wingless aphids on the host leaves had begun to decline. The several peaks in the flights suggest that there may have been 5–6 generations of both species of aphids within the growth period of the seed beets planted in September.

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