

Section VI
Biological and Cultural Controls

RELEASES OF STINKBUG PREDATORS FOR SUPPRESSION OF
COLORADO POTATO BEETLE

K. D. Biever and R. L. Chauvin
USDA, ARS, 3706 W. Nob Hill Blvd., Yakima, WA 98902

In a 1987 field cage study, two stinkbug predators of the Colorado potato beetle, Perillus bioculatus and Podisus maculivertris were evaluated for control of high populations of the Colorado potato beetle (CPB). Tests were conducted in 6' x 6' x 6' walk-in cages with 5 treatments and 3 replications. Perillus was evaluated at 3 levels: 20, 30, and 40 early third instars per cage and Podisus at the 30 level. The control was CPB only. Four potato plants were grown in each cage and 15 egg masses of CPB added (potential of 450 larvae/plant). Predators were released following hatch and checked periodically and damage ratings made. Adult beetles were collected and counted to evaluate predation. The releases reduced populations of CPB by ca. 50% but an increase in predator numbers did not increase reduction.

In a 1988 field cage study, Perillus was evaluated at 5 levels cage: 0, 8, 16, 24, and 32. CPB egg masses were placed on the plants and allowed to hatch to provide a CPB population of ca. 400 per cage. Predators (early 3rd stage) were released following CPB hatch. These releases of Perillus reduced population of CPB; the two highest rates of predators provided over 50% reduction in CPB and a significant reduction in feeding damage.

In field plots in 1988, releases of Perillus bioculatus were evaluated at 3 levels against naturally occurring CPB populations. Plots consisted of 48 potato plants and there were 4 replications. Perillus (early 3rd stage) were released at the following rates per plant: 0, 1, and 3. Perillus at 3 per plant, reduced CPB populations over 60% in 2 weeks and over 80% at three weeks following release. Potato yield was increased over 60%.

Field tests were conducted in 1989 with both stinkbug predators and CPB to test the following: (1) Determine what effect the timing of colonization of the overwintering adult CPB has on CPB population dynamics, feeding damage and yield of potatoes and (2) determine the impact the timing of the colonization has on inoculative releases of Perillus and Podisus. Treatments evaluated were: (1) Perillus (3/plant) at plant emergence, (2) Perillus (3/plant) at plant emergence plus 2 more releases at 3 week intervals, (3) Podisus (3/plant) at plant emergence, (4) Podisus (3/plant) at plant emergence plus 2 more releases at 3 week intervals, (5) Perillus (3/plant) at 10 days post emergence, (6) Perillus (3/plant) at 20 days post emergence, (7) CPB only at 10 days post emergence, (8) CPB only at 20 days post emergence, (9) CPB only at plant emergence, and (10) no CPB or predators. All plots except 10 received 6 adult CPB/plant. Plots consisted of 40 potato plants and there were 4 replications. Row cover was used to exclude local CPB adults.

These tests established the following: (1) Delayed colonization of potato by overwintering CPB adults does not reduce damage but in fact caused increased damage, (2) Both predator species can have a reductive impact on CPB populations when released at 3/plant (early 3rd stage) at initiation of egg deposition by CPB and Perillus has the greater effect, and (3) three releases of the predators at 3 week intervals increased this reductive effect.