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USE OF OSMIA LIGNARIA AS A POLLINATOR OF ALMOND

Project No.: 12-14-5001-558

Cooperator:

USDA/ARS/AR
UMC 53, Utah State Univ.
Logan, Utah 84322

Project Leader: Philip F. Torchio (801)750-2520

Personnel: G. Trostle, M. Klomps, P. Anderson

Project: Tree and Crop Research
Pollination

Objectives: To demonstrate the effectiveness of Osmia lignaria (blue orchard bee) as a pollinator of almonds.

Progress: The most important results obtained from previous research with this native bee species studied in almond orchards are summarized as follows: (1) Bee populations can be force-reared to fly in synchrony with almond bloom; (2) man-made nest materials are readily accepted by nesting bees; (3) both sexes of this bee are highly attracted to almond bloom, and nesting females provision cells with 95-100% almond pollen-nectar resources; (4) the blue orchard bee nests successfully in competition with the honey bee; (5) population sizes have been increased within commercial almond orchard environments; (6) and, the cross-pollination efficacy of this bee on almond is superior to other pollinator species studied.

This research program has also allowed us to study the bionomics of the blue orchard bee and that information has been used in developing practical management techniques. As a consequence, a management program has been developed to maximize increases of populations nesting within orchard environments and, at the same time, assures proper distribution of nesting bees in these orchards.

Plans: Determine best rearing techniques to assure adult bee emergence from natal nest in synchrony with almond bloom by: (1) rearing a population of blue orchard bees in almond orchards during 1981; (2) dividing population of progeny with one subpopulation retained in orchard environments throughout the year and remaining cells reared under laboratory conditions; (3) subdividing laboratory-reared bees (late September) and returning one subpopulation to the orchard environment and transferring remaining population to a constant 4°C temperature cabinet; (4) subdividing that population in 4°C cooler in early December and returning the larger of the subpopulations to almond orchard environments and retaining remaining bees within cooler; (5) monitoring each field subpopulation of bees upon initiation of almond bloom to determine emergence periods and synchrony of emergence with appearance of almond bloom; and, (6) transferring bees from 4°C temperature cabinet to a 26°C temperature cabinet to force-rear bees and determine emergence periods during the time of almond bloom.