

Evaluating Leafcutter Bees for Alfalfa Pollination in the Central San Joaquin Valley

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Leafcutter bees have now been used successfully for the third year in the Central San Joaquin Valley. What began in 1989 with one seed grower and a single field grew to six cooperators and more than two thousand acres in 1991. Data has been collected each year in order to develop recommendations regarding management of seed fields and leafcutter bees for increased seed production.

Incubation proceeded without difficulty using several different grower-managed systems. Bees were incubated as loose cells or in nesting material with equal success. Incubating loose cells puts the bees on a more uniform cycle throughout the first generation - they emerge in a very short period and the population begins to decline fairly abruptly. When bees are incubated in either wood or polystyrene nesting material, there is a more gradual emergence of bees following incubation and the cycles between generations are more staggered. In order to avoid the distinct periods of activity and inactivity brought about by population cycling, growers might operate several incubators to stagger release dates and provide more opportunity to adjust to inclement Spring weather. For California, the loose cell system is recommended over a solid system due to the improved ability to control sanitation and prolong the period before Chalkbrood infests bee populations in this area.

Bees were released into seed fields beginning on May 7, 1991 and continuing through June 15. Planning to release bees when fields are in 35-50% bloom is recommended to provide adequate bloom at the time of emergence, more consistent and warmer temperatures, and fewer problems with third generation emergence late in the season.

Various shelter designs are being evaluated for Central Valley conditions. It is important that the shelter provide protection from direct sun, adequate ventilation to prevent the buildup of heat, and be of a size and mobility suitable to the individual grower's location. Due to the extreme susceptibility of these bees to pesticides, it is important that the bees be moved before pesticides are applied. The grower may choose to move the nesting material and leave the shelters in the field during a pesticide application, or the entire shelter may be moved.

In California, leafcutter bees typically complete a second generation and have a partial third generation. Research is being conducted to work out new management schemes to recover as many bees as possible in hopes of using them again in other areas or in subsequent years. Second generation bees were of higher quality than the bees that were originally purchased with an 80-90% live count in California compared to percentages in the NW of about 50%.

Leafcutter bees compliment honey bees in the pollination process and maximize pollination by working under different environmental conditions or working different parts of the plant. Based on the past two years experience, pollinating with 2 gallons of leafcutters per acre in combination with honey bees is recommended. Using this strategy, in 1991, growers saw yields increase by 225-300 lbs./acre over areas pollinated by honey bees alone. The estimated cost of pollination with leafcutters is being calculated for California, but \$150-200/acre is commonly quoted in the Northwest. At that cost, the grower can easily pay for the cost of pollination with leafcutters, but must still ask whether the increased level of management that they require will fit into their farming system.