UNIVERSITY of CALIFORNIA COOPERATIVE EXTENSION FRESNO COUNTY

SEED CROP NOTES

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ALFALFA SEED POLLINATION--A TEAM EFFORT

Few crops involve as many production variables as alfalfa seed. Of these variables, pollination is probably the most complex. For this job we rely on insects, usually honey bees, to trip the bloom and transfer pollen from flowers of one plant to those of another plant. Self pollination of alfalfa flowers results in fewer seeds and inferior quality of the resulting forage plants.

In addition to the cooperation of honey bees, pollination of alfalfa seed crops relies upon the successful cooperative efforts of at least five individuals. Growers, beekeepers, pest control advisors, pesticide applicators and irrigators must compliment each others efforts to accomplish the pollinating job. We have the tools and knowledge of techniques required to successfully pollinate seed crops in a manner profitable to all members of this team, and certainly the concept of a profit for every business segment is of real importance in this continuing business.

A team effort which relies upon the actions of five people can consistently succeed only by design, and not by accident. Clear communications, acceptance of defined responsibilities, proper timing, and a thorough knowledge of conditions and available tools are needed for a successful pollination team effort.

Clearly written contracts between beekeepers and growers is a good place to begin communications by defining responsibilities. Contracts usually insure better pollination services and should be initiated by the seed grower far in advance of the pollination season. Some points to include in pollination contracts are:

1. Number and strength of colonies required.

A minimum of three colonies per acre, each with at least 800 square inches of brood covered with adult bees, and an actively laying queen in a two-story colony is frequently used. The pollen needs of such colonies are greater than those with less brood, therefore, more bees will become pollen collectors. More than three colonies per acre can be helpful if the crop must be set quickly or if severe competitive bloom exists. Colony strength certification inspections can be requested by beekeepers or growers at cost from county agricultural commissioners in California.

2. When bees are to be moved into and out of fields.

First colonies should normally be moved in when the alfalfa field condition is between 1/3 and 1/2 bloom. This condition is reached in the San Joaquin Valley about

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45 days after a mid-April clip-back of plants. The full compliment of colonies should be moved into the field within 7 days after reaching the 1/2 bloom stage. If the field begins to look like a flower garden there are not enough bees per acre. This can be brought on by strong competitive bloom in the area, insecticide damage or repellency to bees, or complete field irrigation may have made the alfalfa bloom and nectar less attractive to bees than other plants in the area.

3. Description of distribution pattern in or around the fields.

The most effective pollination activity occurs within a 100-yard radius of the colony. Decisions concerning colony placement should also involve the insecticides to be used during the season, accessability of colonies for moving and working, size of the field, and potential insecticide applications to adjacent crops. When bees are placed in the field, 1/10-mile intervals between bee drives is normal with groups of 12 to 18 colonies at each location.

4. Procedures to be followed when pesticides are to be applied.

Control of lygus, aphids, stinkbugs, mites and some lepidoptera larva is often required to produce a profitable seed crop. The pest control advisor, pesticide applicator, grower and beekeeper need to fully understand what each of them is to do in the insect control program to remove the target pests with a minimum of damage to the pollinators.

Proper notice needs to be given beekeepers at least 48 hours before pesticides harmful to bees will be used. If extra movement of colonies in and out of fields may be required, compensation for this needs to be agreed upon and included in the pollination contract. Alternate colony locations within a few miles can be helpful if colony rotation is practiced.

5. Maintenance of bee colonies in proper condition for pollination.

Bees gather pollen to feed their brood. Three weeks is the normal development period required from egg to adult bee. So, an actively laying queen ("queen right colony") is needed for the long alfalfa seed pollination period. During a heavy nectar flow from alfalfa or nearby crops, beekeepers must add more "supers" of open frames. Without open area for egg laying the colony becomes "honey bound" and field activity of the bees will suffer. An extra "super" to provide hive space may also encourage bees to enter the colony earlier on warm nights, which could help to avoid some bee kills.

It is sometimes helpful to provide a second entrance above the ground level to colonies inside seed fields to make it easier to enter and leave without plant or water interference. A fresh water source needs to be available to bees. Responsibility for supplying adequate water should be established in the pollination contract.

6. Rental fee and payment procedure.

Be certain to include these in the pollination contract.

Pest Control Advisor

Pest control advisors play two major roles in the seed production program. They are responsible for keeping the crop protected from harmful insects, while at the same time protecting the pollinators.

A judgment error in either of these two responsibilities can severely reduce the seed production. Growers should select pest control advisors who will properly assess insect populations by number and stage of development throughout the season. This advisor needs to be knowledgeable concerning the registered chemicals available and their effects on target insects as well as their effects on bees. Growers and pest control advisors both should strive to use the least amounts of pesticides required to maintain effective control of harmful insects with a minimum of bee damage.

Pesticide Applicator

The applicator of pesticides for seed alfalfa is responsible for application of chemicals according to their written labels and in accordance with special instructions from pest control advisors and growers. These special instructions should include airplane flight patterns, amounts of chemical active ingredient per acre, gallons of diluent per acre, locations of bee colonies to avoid or treat with different chemicals, night application start and stop time limits, and inspection of fields for bee activity just before flying. The applicator also needs to avoid killing bees in colonies of adjacent fields which can be in a flight or drift pattern.

Irrigators

With all the good and conscientious efforts of beekeepers, pest control advisors and pesticide applicators, still, the irrigator holds a trump card in the proper timing and amounts of water applied during the bloom period. Many seed crops have suffered yield losses from lack of water in the summer months and some have set poor seed yields due to too much water and vegetative growth. Growers need to work closely with irrigators to insure proper water control in each seed field.

Where the moisture content of the soil and plants is high, the sugar content of the nectar is normally low; drier soils and plants usually supply nectar with a higher sugar content. Honey bees prefer plants in moderately dry soil due to the higher sugar concentration in the nectar. Alfalfa flowers of drier plants seem easier to trip, possibly due to increased bee visitations.

Plant Bloom Competition

Alfalfa is not an abundant pollen producer. Where several kinds of flowering plants grow, less alfalfa pollen is collected by bees. Seed growers should plan cropping patterns to minimize competitive bloom effects. The major competitors for honey bee visitation in seed growing areas of California are safflower, milo, corn, cotton, mustard, melons, clover, morning glory, sunflower and asparagus. If these crops or weeds are within two miles of your bee colonies, insect control programs in those fields can severely affect your bees. Such applications should be made at night with short-residual materials which preferably would dissipate before bees return the following day.

A mass exodus of pollinators from an alfalfa seed field to a safflower or milo field can severely reduce the effectiveness of the pollination team's effort. Adjustment of clip back dates in the seed field may help avoid direct bloom competition of adjacent fields.

Summary

Seed production is an interesting challenge to all who are involved. We are fortunate in California to have the climate, tools, knowledge and experienced people

needed to fit the pollination puzzle together. Success in doing this will come only by design, born of mutual need and respect of growers, beekeepers, pest control advisors and pesticide applicators. Clear communications and acceptance of well-defined responsibilities is needed for this cooperative effort. Pollination in commercial seed alfalfa production is no accident. It's a team effort.

CERTIFIED ALFALFA SEED COUNCIL MEETING SCHEDULED

The annual meeting of the Certified Alfalfa Seed Council, Inc. will be held Friday, June 16, at the Holiday Inn, Fresno Airport.

The annual meeting will begin at 1:30 p.m. in the Mauna Loa Room, and will feature a report of past year's activities by the Council and the election of new directors and alternate directors from both the producers and seed trade areas. All seed growers and processors are invited to attend.

CERTIFIED SEED NOTES

See your enclosed copy.

Sincerely,

Bob Sheesley

Bob Sheesley
Farm Advisor

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