AGRICULTURAL EXTENSION SERVICE UNIVERSITY OF CALIFORNIA

SEED CROP NOTES

December 22, 1976

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CALIFORNIA ALFALFA SEED PRODUCTION SYMPOSIUMS

Mark your calendar now for attending the second Alfalfa Seed Production Symposium, Tuesday, March 1, at the Sheraton Inn in Fresno. The program is intended for seed growers, beekeepers, pest control advisors, seed harvest people, seedsmen, bankers, irrigation foremen, pesticide applicators, researchers, educators, and sales people interested in production of alfalfa seed. A similar program will be presented in Holtville on March 3 at the country club. Mark your calendar now, programs and pre-registration forms will be ready in January. A fine group of topics are scheduled for both symposiums.

PRODUCING ALFALFA SEED IN A WATER-SHORT YEAR

Present evidence points to a severe water shortage for irrigation of crops in the San Joaquin Valley during the 1977 season. In anticipation of this possibility, there are some management decisions to be made concerning alfalfa seed production which can result in the most profitable use of available water. In the following discussion, I will review some of the alternatives for a water-short seed production program, including some suggested changes from normal management practices in Fresno County.

Weeds and Volunteers - Weeds and volunteer alfalfa plants utilize water. Preemergence herbicides can be used in the winter months to prevent weeds and volunteer plants. Early spring cultivation and postemergence herbicides can be used to eliminate weeds which escape earlier control.

Thinning Stands - Solid plant stands in seed fields utilize more water and produce less seed than stands with properly spaced plant clumps. In general, highest seed yields on fine textured clay soils, which crack when drying, have come from 30" row plantings with 12-inch spaces between 6-inch clumps of plants. On deep, well-drained, clay-loam textured soils, 40" row plantings with the same "in-row" plant clump spacing mentioned above has been most productive. Blocking of established stands or thinning of new stands can be done with sharp cutting shovels or by welding together the ends of cultivating knives set to the desired blocking distance. Thinning of new stands should be done when seedlings are in the two- to four-leaf stage, but only if stands are uniform with a minimum of four to seven plants per foot. By spacing plants within the row, more light is intercepted and bud regrowth is less inhibited. Research indicates that less vigorously growing alfalfa, with high root carbohydrate reserves, produce more racemes, flowers, pods, and seeds than plants with low root reserves under comparable soil moisture conditions.

Clip-Back - (Suggest a change to earlier March 15th date.) - When ample water is available, best seed yields have resulted in fields clipped between April 1 and 20. These dates bring fields into good bloom in late May and early June. Adherence to this clip-back schedule has assisted in reducing chalcid fly populations by eliminating early developing seed pods suitable for egg deposition by over-wintering chalcid.

Unfortunately, the growth which is removed

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in April uses part of the water supply and doesn't contribute directly to seed production. In face of a water shortage, it seems logical to push the clip-back date up to March 15th to conserve water, even though we can anticipate a slight increase in chalcid damage by doing so. This early clip-back schedule will result in a need for pollination by May 10th-20th in western Fresno County. Honey bees should be leaving citrus groves by early May in this area, and temperatures are ideal for honey bee activity during May and June.

A March 15th clip-back program has certain advantages and disadvantages. Among the advantages will be the following:

1. Better seed yield with limited water supply.
2. Lower insecticide costs and fewer applications of insecticides due to earlier crop harvest, avoiding late season lygus bug population.
3. Less likely to suffer rain damage before harvest.
4. Convenient and less expensive for beekeepers to move directly from citrus locations to alfalfa seed fields.

Among the disadvantages will be:

1. Slight increase in chalcid damaged seed is anticipated.
2. Much reduced hay yield or grazing revenue in the spring.
3. Less time for mechanical control of spring weeds and volunteer alfalfa.

Water Management - In general, highest seed yields are obtained when irrigation practices prevent severe plant stress and promote slow, continuous growth through the entire production period without excessive stimulation of vegetative growth.

Deep soil moisture applied in the winter and early spring can partially offset summer irrigation requirements on deeply rooted stands in clay-loam and lighter textured soils. However, enough moisture must be supplied in the late spring and summer to maintain growth and avoid detrimental effects of severe moisture stress in the upper root zone. Growth and blooming stop under severe moisture stress. The effect of severe drought during the bloom period is to stop photosynthesis, which is needed to produce the substances required for developing and filling seed.

Time of application, total seasonal water available, and the proportion of the total water applied as a preirrigation affect the response of alfalfa to irrigation practices. If growers have only 2 acre feet of water available for the crop year in 1977 and we get some winter rainfall, I suggest not irrigating old stands in the spring until after the suggested mid March clip-back. Seedling stands, of course, need more frequent light irrigations to maintain moisture in the root zone and slightly below roots to promote root extension.

Panoche Clay-Loam Soils and Deep Roots - Irrigation of established stands on Panoche clay-loam soils or on deep soils of lighter texture, with only two feet of available water for the season can most productively be done with a deep spring (post clip-back) irrigation followed by three crop irrigations timed so as to prevent serious plant moisture stress. In western Fresno County, if the deep irrigation is applied by March 20 on clay-loam soils, a typical irrigation schedule might be March 20, May 1, May 25 and June 15. This program is not expected to produce as much seed as one designed with 2.5 or 3 feet of water or more. After harvest, it will be necessary to irrigate continuing fields. It normally takes about .4 feet of water to rot chalcid-bearing seed and keep plants alive until fall rains come.

Merced Clay Soils and Shallow Roots - Irrigation of established stands on heavy clay soils (such as Merced Clay) with shallow rooted plants requires a different approach. If the root zone is too shallow to store much water, or if water penetration is poor, the grower will need to apply more frequent crop irrigations during the growing season.

Field experiments on Merced Clay soil during 1975 in Fresno County gave yields of over 700 lbs./acre with less than two feet of water. Judging from those experiments, a possible irrigation schedule using about two feet of water might be March 20, April 11, May 1, May 20 and June 10. If enough water is available and the amount of bloom justifies it, a sixth irrigation on June 30 will pay great dividends. In such a bloom

situation in 1975, we obtained 210 lbs/acre more seed with a July 2 irrigation termination than with a June 25 termination date on Merced Clay soil near San Joaquin.

SUMMARY

To produce alfalfa seed with only two acre feet of water per acre available during 1977, Fresno County growers will need to change several management practices, and can expect reduced yields if compared to using three acre feet or more. My suggestions for using such a restricted water supply for one year include the following:

1. Control weeds and volunteer alfalfa early to conserve water.
2. Thin seedling and established stands if you have solid plant populations within the row. (6" plant clumps x 12" out is suggested).
3. Clip-back near March 15th to conserve moisture and take advantage of early plant growth for developing of bloom and early pollination. Lay-by should be as close to March 15th as possible.
4. Do not irrigate established stands until after clip-back in March. Crop season irrigations should then be spaced out enough to allow continuous plant and bloom development on the first regrowth and for as long as water is available to encourage bloom development and seed filling. Fields intended for 1978 production will also need a post-harvest irrigation.

If this program is followed for more than one year on most western Fresno County soils, a salt accumulation in the surface can be expected if well water is used. Hopefully, a substantial increase in winter and spring precipitation and snowpack awaits us in 1977.

Sincerely,

Bob Sheesley

Bob Sheesley
Farm Advisor

Enclosure (1)

OUR NEW PHONE NUMBER IS: 453-5931