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UNIVERSITY OF CALIFORNIA

COUNTY OF FRESNO
FARM AND HOME ADVISORS OFFICE

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PRODUCING ALFALFA HAY IN A WATER-SHORT YEAR

Drought Management Seminar
May 10, 1988

Present evidence points to a severe water shortage for irrigation of crops in the San Joaquin Valley during the 1988 season. Some districts and growers will feel the pinch of drought more than others. This newsletter is intended to assist haygrowers in making water use plans. The demand for alfalfa hay looks strong for 1988. To obtain maximum yields from limited available water supplies, some changes may be required in your normal management practices. If you wish to discuss the alternatives related to your own crops, give us a call.

Among crops grown in Fresno County, alfalfa hay is second only to rice in water use per acre. Established alfalfa stands in this area will use about 4.5 acre feet of total water to produce 8.5 to 12 tons of hay. Established alfalfa plants require water earlier in the growing season than do annual crop plants. When temperature conditions are right for shoot growth in the spring there will be a relatively high demand for water by alfalfa plants with extensive root systems. This requirement is relative to the amount of leafy shoot growth covering the ground, because of transpiration from exposure to the sun's radiation.

Producing Most Hay/Amount of Water

If your goal is to produce the most hay from a very limited water supply here are some management suggestions to consider. We know that alfalfa dry matter accumulation (hay yield) per amount of water used is greatest when moisture is readily available to the plant. Water is preferentially taken up by roots from soil layers where the soil water is readily available, however, water is continually withdrawn from drier soil layers providing roots are in the area. Water extracted from drier soil is used less efficiently in dry matter production by the plant. Therefore, it makes sense to fill the effective root zone with water in early spring and keep the effective root zone near field capacity throughout the growing season.

Dry matter accumulation is relative to the amount of food manufactured through photosynthesis, and this increases with the amount of leafy shoot growth. Therefore, if you wish to maximize water use efficiency and hay yields you would allow the plants to grow until about 50% bloom stage before harvesting. This will result in greater yields of somewhat lower quality feed. This practice will also lengthen the stand of life of alfalfa plants.

After the last available irrigation water is applied harvest would be made at about 50% bloom or as soon as the shoot growth obviously stops, whichever comes first. If this growth is not enough to merit a hay harvest, then sheep could be used to remove the top growth. Mature tap roots of alfalfa will go dormant in the dry soil. Although, small root hairs will slough off, a good stand of alfalfa will survive a one-season drought if water is applied the next winter and spring.

Alfalfa weevil and blue alfalfa aphid populations can cause economic damage to spring cuttings of alfalfa. To maximize hay yields for the amount of water used, growers will need to assess populations of these insects during the first two cuttings and protect hay fields from economic damage.

Summary

To produce the most tonage of alfalfa hay with a limited amount of water available some management practices will need to be changed in Fresno County. These practices will help to maximize yields under the water limitations, but growers can expect reduced hay yields if compared to using 4.5 acre feet or more. Our suggestions for using a restricted water supply for one year include the following:

1. Irrigate in the spring and maintain high water availability in the effective root zone until your irrigation water supply is used.

2. Allow hay to grow longer than normal (50% bloom stage instead of 10% bloom) before harvesting.

3. Take the last harvest or graze when shoot growth obviously stops from lack of water.

4. Protect first two cuttings against economic damage by alfalfa weevil and blue alfalfa aphid.

Fields which are forced into dormancy by drought during this season, but are intended for 1989 production, should be irrigated as soon as water is available to fill the root reservoir. This will allow root hairs and nitrogen fixing nodules an opportunity to become established early in the spring of 1989. Hopefully, a substantial increase in winter and spring precipitation and snowpack awaits us in 1988-89.

Sincerely,

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