ALFALFA IN THE NORTHERN SACRAMENTO VALLEY

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Alfalfa culture in the Northern Sacramento Valley has changed dramatically over the past 20 to 30 years. Surprisingly, yields from top commercial fields have not improved all that much despite the indications from company and University variety tests that the potential for yield has increased, if anything top commercial yields were higher 30 years ago. What has changed is the type of soil that alfalfa is grown on and the "quality" of the hay that is produced. The hay "quality" is better, but the soil problems are greater.

Let's look at some of the innovative techniques that allow us to overcome former problems and let us profitably grow alfalfa under conditions formerly thought impossible.

Soil Fertility--Twenty or thirty years ago alfalfa stands generally showed the effects of low soil availability of phosphorus (P) and potassium (K). In response to plant symptoms, some growers applied 40 or 50 lbs. P_2O_5 or K_2O to established stands yearly. The degree of response was disappointing. Most growers, feeling that they did not receive a return on their money, did not supplement the inadequate soil levels with commercial fertilizer.

Studies involving local soils established the lack of movement of surface-applied phosphorus and potassium, through the 3" surface soil layer to the zone of summer root activity. Now banding or plowdown of preplant fertilizers and soil testing prior to planting has become an accepted practice. Gross amounts of supplements are often applied to meet the needs of an alfalfa stand expected to be productive for 5 years. A program might include sources of phosphorus, potassium and sulfur, as well as sugarbeet lime, to correct acidity problems.

Soil Structures--Well-drained soils in the area are generally devoted to orchard crops or crops other than alfalfa with higher income potential. Alfalfa as a rotation appears to have cash flow benefits for some growers who look to other crops for higher income on the well-drained soils.

Soils that develop perched water tables, have massive structure or have a high percentage of clay have become the major alfalfa soils. Many of these soils were formerly thought to be useful only in the production of rice or irrigated pasture.

Varieties--Rainfall, rather than temperature, has dictated the dormancy characteristics of alfalfa varieties grown in the area. Alfalfa that needs harvesting prior to April 15 to achieve low fiber level hay, increases the risk of rain damage. Alfalfa that grows in mid-winter is subjected to a complex of root disease conditions that can cause severe plant loss. Leaf loss of the less dormant can be severe, creating leaf-to-stem ratios of 2-3 rather than the normal 3-2 expected of a more dormant plant's first cut.

Adaptive practices–Bedding of alfalfa for surface drainage is a common practice for the area. The type ranges from corrugations which are 3" grooves about 28" apart used within the border-check with flood irrigations, to 40-60" beds with 5-8" deep furrows. Stub borders 30' to 60' apart are used to guide the irrigation water into the furrows which start 30-50' from the ditch or pipeline outlet.

Some growers with alfalfa growing in poorly drained soils, disliking the idea of either the corrugated or bedded field surface, have chosen to apply nitrogen (N) with some sulfate sulfur to "start" the field after harvest. The 20-30 lbs. of N per acre is applied with or prior to the first irrigation. While the reaction to this practice by onlookers is often negative, once the grower commits to an unmodified field surface there is little choice. A relatively lengthy period of supersaturated soil in the summer causes a loss of fine feeder roots which possess the nitrogen producing nodules. This prevents vigorous recovery of the plants from cutting and increases the propensity for scald from that irrigation. Sulfur is quite vulnerable to loss when soils are supersaturated. The small amount of sulfur appears to increase the vigor of the plants recovering from the irrigation.

Bedding is not advisable when soils have been found to have sodium or alkalinity excesses. In addition, some of the soils that have poor internal drainage do not sub-irrigate well. Consequently, beds are not wetted to the center. Corrugations with nitrogen supplementations are more appropriate. Often the soil structure and water infiltration rates improve greatly enough after the second summer because of the extensive root development of the plants that the supersaturated soil conditions no longer exist to the initial degree. Growers term this as the "field opened up".

Fall plantings are much more desirable from a root development standpoint. Mid-September to early October are the most desirable; however, only a small percentage of the growers start their fields in September. Many gamble on the fall rains to initiate germination. Often this practice requires a second seeding in the spring. Growers have found the no-till drill useful for the purpose. Seed dealers and Farm Advisors are the only ones that profit from the late plantings. Seed dealers sell more seed and Farm Advisors have more problems to find solutions for.