

LIMITING FACTORS IN ALFALFA PRODUCTION AND ADAPTATION
IN SOUTHERN CALIFORNIA

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For the purpose of this talk, Southern California embraces the area south of the Tehachapis to the Mexican border and includes the Mojave Desert and Owens Valley to the east of the Sierras. The region is diverse in climate, and crops that can be grown economically. Within the area, alfalfa is grown from elevations up to 5,000 feet in Mono County to below sea level in Imperial County. A little over a quarter of a million acres of alfalfa are grown in the region, over half of which is grown in Imperial Valley. Soils of the region vary from sands to clays but one thing they have in common is salt buildup, if irrigations are not properly managed.

Harvesting and water management are common problems throughout the region. Likewise, aphids and weevils are a constant threat in all areas. Other problems may occur in one or more areas or be specific for a small area. For this reason, I shall break up the region for ease of discussion.

All of San Diego County's alfalfa acreage is grown on sandy to sandy loam soils of the Anza-Borego desert, the San Pasqual Valley near Escondido, or the mountain areas between. Fields are small and pose many managerial problems. Rodents are especially troublesome. In the San Pasqual Valley where most of the acreage exists, no chemicals are used to control weeds or insects. The Egyptian alfalfa weevil usually causes complete loss of the first cutting each year, and a considerable portion of the second. Winter annual weeds produce most of the forage harvested in the first and second cuttings.

In the inland valleys of Riverside and San Bernardino Counties, air pollution or smog damage to alfalfa is the greatest problem. Damage can occur most any time of the year, but is usually highest during the late summer and fall months before the rains come. Yields may be reduced by one third. Gophers and other rodents can be especially destructive in these areas because fields are small and frequently there are many idle or lightly cropped adjacent lands to provide habitat for rodents. Weevils and aphids are constant threats to good production. Bacterial wilt, Phytophthora, Stemphyllium, and Anthracnose are found in fields in this area along with root knot, and lesion nematodes. Varieties of alfalfa tolerant to most of these problems, except rodents, seems to be a possibility for development in the future.

The Southeastern tip of San Luis Obispo and Northeastern tip of Santa Barbara Counties, known as the Cuyama Valley, has many production problems. This area is best adapted to growing semi-dormant to dormant-type alfalfas, but many growers like the non-dormant types. Problems in the Cuyama Valley are weeds - especially dodder, aphids and weevils some years, bacterial wilt, clover root curculio, and on wet years, stem nematode. In an area where the soils are mostly sandy and field cubers are used, soil compaction and harvest management problems are acute.

The high desert area of Los Angeles and San Bernardino Counties comprising the Antelope Valley, Lucerne and Apple Valleys, and the Barstow-Harper Lake area, is a large area with predominately sandy to sandy loam soils but scattered areas of alfalfa production. While management is the key to good alfalfa production there are problems that can be reduced by growing the best varieties of alfalfa. Throughout this region, semi-dormant to dormant varieties should be grown. Resistance to aphids is desirable. Since fields remain in productivity several years, or are taken out and replanted to alfalfa again, resistance to bacterial wilt, Phytophthora and other soil-borne diseases would provide better insurance for productivity. Only occasionally in the wettest spring seasons, does stem nematode show up, and this only in the western Antelope Valley.

Root knot and stubby-root nematodes are severe problems in some parts of the region. Occasionally it is difficult to establish stands due to nematodes. Weeds reduce quality of the first harvest each year when not controlled, and summer annual grasses and dodder are an ever increasing menace.

The Owen's Valley area of Inyo and Mono Counties has fewer problems in alfalfa growing than any of the other areas of the Southern California region. Varieties grown are of the semi-dormant to dormant types. Over-irrigation is rarely a problem and with minimal irrigations, root rots and soil-borne diseases are minimized. Fewer harvests per season, three to five, also mean less crown damage and compaction problems. Longer stand life and replanting alfalfa back in the same fields, make resistance to soil-borne diseases desirable insurance factors in the selection of varieties for this area.

The lower Colorado River desert valleys of Imperial and Riverside Counties produce over two thirds of the alfalfa of the Southern California region. The most non-dormant alfalfa varieties are grown in these areas. Growth is continuous over the whole year with as many as 8 or 9 harvests made. Even during the relatively non-productive winter months, there are some harvests made, and there is considerable grazing of alfalfa fields.

"Summer slump" in the Imperial, Palo Verde and Coachella Valleys is the biggest problem in alfalfa production. Extremely high air and soil temperatures, salinity problems, the need for frequent irrigations causing poor soil aeration, and the occurrence of Rhizoctonia and a high-temperature Phytophthora all contribute to the "summer slump" complex. Stand renovation and reseedling into old stands tend to accentuate seedling disease problems. Aphids, especially the spotted alfalfa aphid and the new blue aphid have created serious problems in the past. The Egyptian alfalfa weevil and the 3-cornered leafhopper and potato leaf hopper have also caused serious problems at times.

In summary and drawing conclusions about the limiting factors of alfalfa production in Southern California, I would have to say that management, good management, is the key to improving alfalfa production. Selection of the right variety for each farm; proper irrigation and cutting management; control of insects, weeds, diseases, and nematodes wherever possible; and the meshing of all of these into sound cultural practices would help alfalfa be the profitable crop that it has the capacity to be.