Behavior of Alfalfa Varieties in the Valley of Mexico

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IRRIGATED alfalfa is the most important forage crop for the dairy industry of Mexico. About 136,000 acres of alfalfa are scattered throughout the Republic, with the heaviest concentration of alfalfa fields occurring within numerous milksheds such as the one surrounding Mexico City in the heart of the Valley of Mexico. Alfalfa is utilized very intensively. It is either grazed or cut and fed green from 8 to 12 times a year, depending upon the area. Very little alfalfa hay or silage is made. Because of the importance of alfalfa, one of the objectives of the joint forage program of the Secretaría de Agricultura y Ganadería and The Rockefeller Foundation has been to determine the best adapted varieties. Considerable emphasis has been given to variety testing in the Valley of Mexico.

Geographically the Valley of Mexico is in the tropics, but because of the high elevation of approximately 7,600 feet the climate is temperate. Seasons, however, do prevail. During the summer the temperature averages 63.8°F and during the winter it averages 57.1°F. Frosts of short duration are common at this altitude during the wintertime, and the nights are quite cool. The rainy season occurs approximately from June through October, and the remainder of the year is dry. During the rainy season, irrigation is not normally necessary for alfalfa, but during the dry season it is essential if production is to be maintained.

MATERIALS AND METHODS

A replicated alfalfa variety trial was established at the Experimental Station in Chapingo, Mexico, in the summer of 1952 to determine the comparative behavior of eleven alfalfa varieties. The trial was established on a soil of high fertility at a seeding rate of about 25 pounds per acre. The test consisted of two popular Mexican varieties called Oaxaca and Apaseo; Valenciana, a variety from Spain; and eight varieties from the United States representing both the non-hardy and winter-hardy types. The non-hardy varieties were California Common, Hairy Peruvian, Southwest Common, Arizona Chilean, African, and Caliverde. The winter-hardy varieties were Ranger and Kansas Common. The varieties African, Hairy Peruvian, Valenciana, Apaseo, and Oaxaca are commonly grown at the present time in the Valley of Mexico. The dimensions of the individual plots were 2.5 by 10 meters, from which a swath 1 by 10 meters was harvested with a power mower in order to determine yield. During the first harvest year, all varieties were cut six times and yields recorded in green weight. During the second harvest year, all varieties were cut eight times except Ranger and Kansas Common, which were cut only seven times because of lack of production during the winter. Facilities were available during the second year to permit the handling of moisture samples and expression of yields on a 12% moisture basis. Besides yield, data such as recovery after cutting, height at cutting, maturity, survival, and susceptibility to disease were recorded.

RESULTS AND DISCUSSION

Forage yields.—Forage yields, by cuttings, are presented in tables 1 and 2. In the first harvest year, 1952-53, there were no significant differences between the varieties for total season yield at the 5% level of probability although yields ranged from 37.31 to 46.70 tons of green alfalfa per acre. In the second year, there were significant differences between the varieties for total season yield.

Apaseo and Valenciana were the two highest yielding varieties in both years. In the second year, the non-hardy varieties produced significantly more forage than the winter-hardy varieties—Ranger and Kansas Common. The non-hardy varieties Arizona Chilean, African, and Southwest Common yielded more than Arizona Chilean, African, and Southwest Common in the second year. Although these differences were not significant at the 5% level of probability.

The analyses of variance revealed that there were significant varieties × cuts was highly significant at the 5% level of probability. This indicated that the varieties performed differently at the different cuts. Figure 1 graphically illustrates the seasonal distribution of forage production of some representative varieties during the second harvest year. There was a general tendency for production of alfalfa to decline during the winter, primarily because of low temperatures. Ranger and Kansas Common yielded less forage during winter and therefore produced very little during this time of the year. Consequently no