As early as 1923 the stem nematode, Diodylenchus dipsec (Kühn) Filipjev, was reported to occur on alfalfa in California (12). To date the parasite is found in several alfalfa producing areas of the state, especially in coastal regions, the Antelope Valley, and certain parts of the Central Valley. Frequently, great destruction is observed in fields on dairy farms where alfalfa has been grown repeatedly on the same land, thus favoring the build-up of large populations. In stem nematode-infested fields, if alfalfa is grown after alfalfa, the seedlings may become damaged. If alfalfa follows another crop, the damage generally appears in the second year in the form of barren patches which may increase in size in succeeding years. The alfalfa stand on entire fields may be destroyed. Stem nematode attack of seedling plants results in swelling of the cotyledonary node. The subsequently-developing leaves have swollen and stunted petioles. Susceptible seedlings seldom recover under field conditions. Infested older plants show swollen stems, buds, and petioles, as well as distorted leaves and petioles. The surface of the swollen plant parts is rough and frequently shows brown discoloration. Heavily-infested stems are brittle and break off easily. The color of the foliage tends to become yellowish-green.

Lahontan is a stem nematode-resistant variety of alfalfa which has been grown successfully in infested fields. However in the absence of the parasite it yields less than Caliverde, a variety bred for California conditions. A stem nematode-resistant variety adapted for California conditions would be valuable. More knowledge concerning possible sources of resistance and the inheritance of resistance is desirable before undertaking such a breeding program. Previous studies on the inheritance of resistance suggested a multifactorial system (3, 10).

The purpose of the present investigation was to find alfalfas possessing a high degree of resistance to the stem nematode, and to evaluate them as to their suitability as sources of resistance in a breeding program. Hence, alfalfas of various origins were tested for their resistance to the stem nematode, and the inheritance of this resistance was studied.

LITERATURE REVIEW

Since the stem nematode has been causing damage to numerous important crop plants, inheritance studies and breeding programs have been carried out in plants other than alfalfa. In red clover, selection for resistance was successful in developing strains resistant to the stem nematode. Concerning the inheritance of resistance, Frandsen (4) found that resistant families could be obtained in the progenies resulting from crosses between resistant and susceptible plants. Bingley (1, 2) studied the inheritance of resist-