VARIETAL SURVIVAL OF ALFALFA ON WILT-INFESTED SOIL

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The duration of productivity of established fields of alfalfa on fertile soil in Wisconsin is influenced largely by winter injury, and especially in the southern and western parts of the state, by the bacterial wilt disease caused by Phytophthora insidiosa. Winter killing or injury is due, primarily, to climatic conditions and after seeding it may occur during the late fall, winter, or early spring period of any year. Bacterial wilt occasionally destroys a field in a single summer, but usually it develops progressively, reducing the plant population below a profitable level after the third cutting year.

When wilt and winter injury are associated in thinning stands it is difficult to distinguish the degree of loss occasioned by each. As an aid in appraising the losses resulting from these two enemies of the alfalfa plant from the standpoint of survival value under Wisconsin conditions, a field comparison was made of strains of generally known wilt and winter resistance.

PLAN OF EXPERIMENT

The trial was conducted on wilt-infested rolling (Carrington) silt loam soil in Green County, Wis. Alfalfa had been grown in this locality for some 30 years and it is reported that at first stands survived 8 to 10 years. However, since 1925, when bacterial wilt was found thoroughly distributed, stands have not remained productive after the third cutting year.

The soil (3 acres) was properly limed and fertilized with phosphate fertilizer. The area was divided into plats. Two of these were long and parallel strips 4 rods apart, 2 rods wide, and 64 rods long. One of these was sown with winter-hardy and wilt-resistant Ladak alfalfa; the other to winter-hardy and wilt-resistant Imported Turkistan. Between and bordering these two long check plats, eight plats (4 rods x 8 rods, except one 4 rods x 5½ rods) were marked out and sown with wilt-susceptible strains of varying degrees of winter resistance, as follows: Grimm (1 plat), Cossack (1 plat), Canadian variegated (2 plats), Montana (2 plats), and South Dakota common (2 plats). Each of these plats was separated one from another by a 6-foot alley which was seeded with timothy and clover. The seed used was believed to be fairly representative of these varieties and strains, and all seedings were made on April 14, 1929. Thick and uniform stands of alfalfa were established, and after 1929 the plants were cut under a field schedule of two cuttings annually. No yields were taken, but beginning in April, 1931, when the plants were quite free from winter injury and before symptoms of wilt had appeared, counts of the number of plants on unit areas of 1/20,000 acre in each plat, were taken at various intervals of time (Table 1). The number of individual counts made at any one time varied with the condition of each plat, consideration being given to any irregularity in stand that had developed.

*Published with the approval of the Director of the Wisconsin Agricultural Experiment Station, Madison, Wis. Received for publication February 21, 1935.
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