IS RESISTANCE TO VERTICILLIUM WILT IN GUAYULE RELATED TO CHROMOSOME NUMBER?

Strains of rubber-producing guayule (Parthenium argentatum Gray) differ in their chromosome numbers which vary in multiples of 18, viz., 36, 54, 72, and higher. Some euploid and aneuploid variation also occurs within strains, but in the following they are listed on the basis of the chromosome number prevalent in each. In a planting made at Stanford University in 1947, it appeared that Verticillium wilt (identified by Dr. H. N. Hansen) had infected diploids having 36 chromosomes more than the polyploids in an adjacent plot. In the following year, counts of plants dead or severely affected by the disease were made in the field plantings designed by Dr. LeRoy Powers for yield testing purposes and located near Salinas, Calif. (Table 1). The data show highly significant differences between diploids, triploids, and tetraploids, resistance increasing with the chromosome number. The only exception was Strain A-4263, a triploid, which was found as resistant as the tetraploids (Tables 1 and 2). In the randomized block design only one diploid strain was represented, but five diploid strains were planted in the border plots which divided the field into 24 units. These diploids show similarly high percentages of losses from wilt, though a direct statistical comparison has not been made because of the difference in field design.

Corroborative evidence came from a planting in the Salinas area. The mean losses encountered here are given in Table 2. The data exhibit the same trends, and it may be added that Schneider in 1943 observed one or more relative susceptibilities for the strains were presented both in his and the present study. Strain 109 had the most susceptible, with 407 intermediate. Strains 405 and 407 were intermediate. Strains 405 and 407 were intermediate. Strains 405 and 407 were intermediate.

It would be interesting to investigate for this rather unique behavior in guayule, as possible explanations come to mind; one, the occurrence of high numbers of chromosomes in guayule.