1936 and 1937. This plot had inadvertantly been established on an old alfalfa field which formerly was heavily infested with the alfalfa stem nematode, Ditylenchus dipsaci. Among the many varieties planted was one known as Turkestan 19304 which was found to possess almost perfect immunity to stem nematode while adjoining plots of Utah Common, Grimm, Ladak, etc. were severely damaged.

Efforts to find nematode resistant sugar beets have been unsuccessful but the fact that nematode resistance does occur in certain crop plants gives us hope that some day a nematode resistant beet may be discovered.

LIST OF GENETIC FACTORS AND CHROMOSOME MAP OF THE R CHROMOSOME IN BETA VULGARIS

F. V. Owen and F. A. Abegg, U. S. D. A.

Fourteen characters in Beta vulgaris have been found to be inherited through simple Mendelian factors. Eight of these factors are in one linkage group and hence it is assumed that these are located on one chromosome. The chromosome presumably carrying this linkage group may be designated as the R chromosome from the factor R for red pigment. Most of the factors are either color genes or mutations for abnormalities. Special interest has been centered on a factor of self fertility; one is identified with bolting, or the annual character; and another conditions the degree of curly-top resistance.

THE INHERITANCE OF CURLY-TOP RESISTANCE IN BEETS

F. A. Abegg, U.S.D.A.

Resistance of beets to the curly-top disease is conditioned by a partially dominant factor C. Groups of plants resembling the resistant and susceptible parental strains were recovered in F_2. The postulation of the C factor is strongly dependent on a linkage with the crown color factor R. Red and white F_2 classes differed significantly in both foliage symptoms and root weights. F_3 data support the existence of the R-C linkage is generally applicable to various degrees of resistant types selected from the U. S. No. 1 and U. S. No. 12 varieties.

GENETICS OF SELF-FERTILITY AND SELF-STERILITY IN SUGAR BEETS

F. V. Owen, U.S.D.A.

Sugar beets may be classified into three classes with regard to self-fertility: Highly self-fertile, intermediate, and strongly self-sterile. Environmental conditions influence the expression of these heritable tendencies. Under special conditions selfed seed can even be secured from strongly self-sterile plants, but this is not associated particularly with health and vigor.

The healthiest and most normal plants frequently show the highest degree of self-sterility. This condition is explained on the basis of chemical substances in the stylar tissue which prevents pollen tube growth. A single Mendelian factor SF will produce self-fertility and can be readily transferred from self-fertile races to self-sterile races.

THE INHERITANCE AND UTILIZATION OF MALE STERILITY IN SUGAR BEETS

F. V. Owen, U. S. D. A.

Male sterility in beets is brought about by pollen abortion. Completely male sterile plants may develop normal female flower portions although their pollen is aborted. This character is presumably inherited by complementary factors. Male steriles can be crossed with certain known complements bearing normal flowers and the result is complete male sterility in the hybrids. Therefore, one may speak of the character as being dominant and in this sense it differs from most male sterility reported in other plants.

Male sterility in corn and sorghum is recessive and perhaps of little use in a breeding program. The dominant nature of male sterility in beets makes it of considerable practical interest in connection with hybrid vigor. By using male sterile plants complete hybridization is assured with possibilities of the well known increase in growth known as hybrid vigor.

THE COMPARATIVE RATE OF BOLTING IN VARIOUS CROSSES BETWEEN ANNUAL AND BIENNIAL STRAINS OF BEETS

F. A. Abegg, U.S.D.A.

This paper presents data on the comparative rate of bolting or seedstalk development of F_1, F_2 and backcross progenies derived from crosses of Munerati's annual strain with various biennial selections. The annual parental strain has a higher average rate of seedstalk development than F_1, F_2 or backcross progenies. Backcrosses in all combinations tested were slowest in rate of bolting.

In several crosses it was evident that the F_2 rate is somewhat lower than the rate of bolting of F_1 plants. A tentative explanation for these results is based on the combined effects of the annual factor B and the probable action of several independent modifying factors.

ABSTRACTS OF RUSSIAN PAPERS

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Abstracts read by title.