

change brings a great increase in bivalent formation, and eliminates formation of the more complex types of quadrivalents.

If this change in E. perennis can be considered to be evolutionary in nature, it may be deduced that E. perennis is intermediate along the road from autotetraploidy to functional diploidy. If the goal is merely the attainment of 100% chiasma interference for whole chromosomes, it seems likely that the end result could be an individual whose chromosomes pair randomly at pachynema, but which has only bivalents at diakinesis. Such a quadridiploid would show the 5:1 backcross ratios typical of autotetraploids, but would have perfect chromosome stability.

The finding of a probable inversion in the short arm of chromosome 9 in perennial teosinte (article 8 above) indicates that E. perennis is a recent autotetraploid. The modification in chiasma frequency may therefore relate to a more or less simple genetic system. If simple, it may be amenable to use in improving the fertility of tetraploid maize.

-- Donald L. Shaver

13. Pollen physiology and biochemistry.

A study of pollen biochemistry is in progress. Preliminary results (see MNL 33:23, 1959) suggest that the pollen grain can be considered as a metabolically rich entity, analogous to a microorganism. Relatively small samples of pollen can be used for micro-qualitative and quantitative chemical determinations, as well as for physiological observations. From a knowledge of pollen biochemistry, it may be possible to judiciously employ specific chemical tests to elicit a colored test-reaction, thus affording the possibility of describing pollen phenotypes.

To deal with individual pollen grains, the autonomy of the grains and their contents is required in the test system. This requirement can be met favorably by "plating" pollen on agar-type surfaces. Pollen grains will absorb some chemical test materials from 1-5% agar (Difco certified Bacto-agar), yielding the color test. The use of petri dishes for plating is particularly adapted to rapid counting by using the standard equipment of the bacteriologist. Although aliquots of only dried, non-viable pollen samples have been studied thus far, samples of viable pollen will be tested as the pollen becomes available.

-- D. B. Walden

14. Effect of the abnormal chromosome 10 on chiasma formation and metaphase orientation in T6-9b heterozygotes.

Cytological observations at diakinesis, metaphase I, and quartet stage were made on two T6-9b heterozygotes, sib plants which differed in that one was N 10/N 10 and the other was N 10/abn 10. The break in 9S is proximal to the Wx locus and the break in 6L is between Y and the centromere. A large knob was present on chromosome 9 while the 6⁹ chromosome was knobless. The results are tabulated below: