Frequencies of tetraploid and triploid progeny from diploid-tetraploid crosses.

| Seed parent | Total no. fertilizations | Total no. verified progeny 4n | 3n | Frequency per 10,000 fertilizations 4n | 3n |
|---|---|---|---|---|---|
| WF9 | 230 | 8 | 0 | 348 | 0 |
| R205 | 870 | 15 | 0 | 172 | 0 |
| B46 | 2100 | 17 | 1 | 81 | 5 |
| 38-11 | 320 | 2 | 0 | 62 | 0 |
| R107 | 320 | 2 | 0 | 62 | 0 |
| B10 | 900 | 4 | 0 | 44 | 0 |
| R211 | 870 | 0 | 10 | 0 | 115 |
| R81 | 2720 | 0 | 9 | 0 | 33 |

The quality of triploid seed varies widely. All triploids cited in the table survived field planting and in all cases were plump and indistinguishable from tetraploid or diploid kernels.

An unusual ear was found in inbred B10 pollinated by the 4n male. The ear bore the usual shriveled triploid kernels on one side and plump kernels on the opposite side. Further, the frequency of triploids among the plump kernels was very low. Subsequent examination of stomata of seedlings from plump kernels revealed that they were 4n. The sector bearing plump kernels presumably was tetraploid. Estimates of spontaneous non-reduction, based on unmarked 2n x 4n crosses, are likely to be too high since tetraploids arising from sectorial chimeras cannot be distinguished from those arising from meiotic accidents.

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2. <u>4n corn by 4n sorghum hybridization attempts.</u>

Attempts have been made for several years to cross autotetraploid sorghum and autotetraploid corn. The effort has primarily been made using corn as female although male sterile tetraploid sorghum has also been used as female on occasion.

In 1962, approximately 80 putative hybrids were dissected from kernels exhibiting varying degrees of stimulation and transferred to sterile media. Many failed to differentiate normally; others slowly developed and were transferred to pots. All those showing near-normal growth have turned out to be parthenogens, or contaminants.

Several interesting growth patterns have been observed in some of the dissected embryos. One produced 10-12 plumule-like green projections on a sphere of undifferentiated tissue. Another produced a near-normal epicotyl that grew into the medium and maintained its green color for a time.

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3. Corn x Tripsacum hybrids.

The relationship of corn and *Tripsacum* has long been recognized. Forty-six European varieties and 82 corn belt inbred lines of corn were crossed with a clone of *Tripsacum dactyloides* having 2n=36 chromosomes. Corn was used as a female parent and two ears of each line were pollinated with *Tripsacum* pollen by the method outlined by Mangelsdorf and Reeves (1939). Immature embryos were excised under sterile conditions 12 to 28 days after pollination and were grown in nutrient media (White, 1943) in small 3 1/2" vials. Best growth was observed in embryos cultured 18 to 20 days after pollination; however, younger and older embryos failed to grow *in vitro*.

In general, *Tripsacum* crosses with open-pollinated European corns were more successful than when corn belt inbred lines were used. Fifteen of the 46 European varieties produced viable embryos when crossed with *Tripsacum*. Of the 82 corn belt inbred lines, only 12 were able to hybridize with *Tripsacum*. Reciprocal crosses using *Tripsacum* as female parent were also attempted, but in almost all cases, plants produced from the embryos are like *Tripsacum* and are probably apomictic. Further studies on the chromosomal relationships in the hybrids are in progress.

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4. Location of brachytic-2 dwarf.

Mung(unpublished) found the possible location of brachytic-2 as chromosomes 1, 3 or 6. An attempt was made to locate this gene, with A-B translocations, on the above mentioned chromosomes. Dwarf type plants occurred in the $F_1$ cross ($br_2/br_2$ x TB-1a)(break in 1L .2). but because of the reduced vigor of the hypoploid individuals it was impossible to classify the plants as dwarf or normal. Therefore, the $F_1$ hypoploid plants were backcrossed to the following three genotypes: $Br_2/Br_2$; $Br_2/br_2$; $br_2/br_2$. The data for the backcross progeny, presented in table 1, indicate that brachytic-2 is located in the long arm of chromosome 1.