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phenotypic correlations of grain yield with the latter two characters were insignificant. Test weight (100 grain weight) was positively correlated with plant height but negatively correlated with the number of productive tillers. Number of grains per ear was found to be a more important yield component than the test weight of grains and productive tillers. There was a positive correlation of grains per ear with plant height, length of spike with and without awn, number of stem internodes and leaf width. Positive correlation of leaf width was also observed with length of spike with and without awn and number of stem internodes. Leaf index (length/width ratio) was negatively correlated with all the characters, including grain yield and its component characters, indicating that wide-leaved plants should have better yield because wide leaf provides greater photosynthetic area as compared to narrow leaf. Environmental correlation between grain yield per plant and number of productive tillers was present in an appreciable magnitude and it was positive. Very high negative environmental correlation was obtained between grain yield per plant and grains per ear, between leaf width and leaf index and between 100-grain weight and leaf width.

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II.26. Triploids in barley. Jens Sandfaer, Agricultural Research Department, Risø National Laboratory, DK-4000 Roskilde, Denmark. "R"

Triploids in barley were previously considered to occur rarely. It has now been found, however, that triploids in rather high frequencies occur after infection with the barley stripe mosaic virus (BSMV) (Sandfaer 1973) and in very high frequencies in plants which are homozygous for the recessive mutant gene tri (triploid inducer) (Ahokas 1977, Finch and Bennett 1979).

In normal genotypes (varieties) not infected with BSMV, triploids in low frequencies have also been observed (Sandfaer 1975). Through seed fractionation it was found that seed fractions could be selected easily, yielding rather high frequencies of triploids. In the pooled material from 39 varieties the frequency of triploids among plants from shrivelled seeds (13.7 mg per seed) was about three per cent and among plants from very light seeds (3.5 mg per seed) as high as about ten per cent. Of the 39 varieties investigated, triploids were found in 22 of them. The frequency of triploids in the non-fractionated seed batches of the individual varieties ranged from zero to 0.3 per cent.

The selective value of triploids is low. The triploids originate - as mentioned above - from very light and shrivelled seeds and during a normal seed-cleaning procedure all or nearly all of these seeds will be discarded. With a less thorough seed-cleaning procedure, as often applied to plant breeding material, the probability for triploid seeds to remain in the seed material will increase. The germination of triploid seeds is usually delayed a few days and the seedlings are weak. Therefore, under the strongly competitive conditions normally present in a barley field, the probability for triploid plants to survive to maturity is low, but now and then a few triploids might survive even under these conditions. Increasing the planting distance reduces the competition among the plants and thereby increases the probability for triploid plants to survive to maturity.

Barley triploids have a great percentage of sterile flowers and their offspring consists primarily of aneuploids (review in Sandfaer 1979). Thus, an analysis of the chromosome numbers of the few seeds of highly sterile spikes now and then found in the field may elucidate the possiblity that some of these spikes originate from triploid plants.

Table 1. Survey of the total material analyzed.

Number of spikes	Spike groups 1/	Percentage of spikes	Number of progeny plants			
			per spike	total	diploid 2n = 14	aneuploid 2/
458	1	20	0	0	--	--
	2	41	3.7	701	701	0
	3	39	2.1	380	94	286

1/ See text for explanation.

2/ This group comprises all plants with chromosome numbers deviating from the diploid number.

In 1974 and 1975 a total of 458 spikes with a high percentage of sterile flowers were collected in the field (Sandfaer 1980). From these spikes 1081 progeny plants that could be chromosome counted were obtained. The chromosome counts of the progeny plants revealed that they comprised diploids

(74%) as well as a considerable fraction of aneuploids (26%) indicating that not all spikes originated from normal diploid plants (Table 1). Based on the germination and on the chromosome countings the spikes were assigned to one of three groups, 1, 2, and 3. Group 1 comprised completely sterile spikes, group 2 comprised spikes with diploid seeds only, and group 3 comprised spikes with at least one aneuploid seed. The frequency of spikes in the three groups was 20, 41, and 39 per cent, respectively. Of the 380 progeny plants in group 3 it was found that diploids constituted 25 per cent of the plants. Plants with one, two, or three extra chromosomes constituted 37, 20, and 8 per cent, respectively. Ten per cent of the plants had chromosome numbers higher than 2n = 17. The distribution of the progeny plants from the spikes in group 3 according to chromosome numbers was in good agreement with the distributions known from progenies of triploids. This suggests that all or nearly all of these spikes originated from triploid mother plants. The spikes in groups 1 and 2 may all have originated from diploid mother plants, but with such a limited number of progeny plants per spike (0 and 3.7 for groups 1 and 2, respectively), it cannot be excluded that some of these spikes originated from non-diploid mother plants, for instance from triploids.

The low selective value of triploids normally ensure their effective elimination, but the result of the present investigation showed that an occasional triploid seed may remain in the seed batch and survive to maturity resulting in the occurrence of spikes with a high percentage of sterile flowers. The results of the investigation supported the assumption presented above, viz. omission of a normal seed-cleaning procedure and an increase in the planting distance increases the probability of triploid survival.

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