Actual yields of varieties and composites at two locations in 1961.

Variety or composite	College Station	Temple
	bu. per acre	bu. per acre
YS variety	48.5	46.0
YS_1 composite	61.9	51.3
YS_2 composite	68.8	52.0
YS_3 composite	61.7	52.0
FYD variety	49.5	51.2
FYD_1 composite	52.4	53.9
FYD_2 composite	57.0	54.7
FYD_3 composite	64.6	60.7

In both groups, the lower-yielding top crosses have been reduced in each cycle. Also variation among top crosses was reduced in the fourth cycle tests.

Yields of crosses among testers in composites indicate that a large portion of the increased combining ability can be attributed to the YS composites, especially the YS_2 composite. The accompanying table shows no change in the combining ability of the FYD composites. Actual yields of composites may indicate different types of gene action in the two source varieties.

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1. In 1961 several thousand seeds from a cross (Bl4 x 4Co63) x A C R B Pl were germinated in the dark and classified for purple root color to identify monoploids. In addition to the expected monoploids, a class of plants was found which were of normal fertility and presumably diploids. These came from kernels having colored aleurone and the plants lacked purple color. In every case such plants, when selfed, were found to be heterozygous for yellow endosperm color. The parental single cross was (Y x y). Therefore the exceptional class of plants is interpreted as being maternal diploids. Maternal diploids and monoploids occurred with roughly equal frequency.

G. F. Sprague

2. An F_2 three-point test involving Bt Pr gl_{10} / bt pr Gl_{10} gave the following results:

Bt Pr Gl	Bt Pr gl	bt Pr Gl	bt Pr gl	Bt pr Gl	Bt pr gl	bt pr Gl	bt pr gl
306	161	28	7	98	0	39	1

Crossover percentages are higher than normal for the Bt-Pr and Pr-Gl regions but the suggested three-point order is Bt-Pr-Gl. My stocks of gl_8 and gl_{10} have either become mixed or these 2 glossies are identical.

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1. Genetics of tillering.

A project has been initiated to investigate what if any genetic basis exists for tillering in some of the races such as Parker's Flint in contrast with many midwest inbreds and other races such as Zapalote Chico. Crosses have been made this winter in Florida between Parker's Flint and a series of translocations compiled by E. G. Anderson and E. B. Patterson. In addition, tillering and non-tillering sibling plants from several backgrounds were selfed in 1961; these seeds will be grown and the progeny checked further this coming year.

It is the aim of this project to try to relate expressed morphology more closely to genetic background. Since environment plays a seemingly significant role in tiller development, knowing whether or not specific genes for tillering exist in a particular plant should provide a means of separating environmental and genetic influences on tiller and presumably other aspects of plant development with greater accuracy than is now possible. The aid of E. G. Anderson, E. B. Patterson and W. L. Brown has been enlisted in various ways.

N. H. Nickerson

2. Responses of certain tassel and dwarfing genes to growth substances.

A series of tests was run during 1961 on na_1, na_2, py, br_1, cr_1, d_1, d_2, nl, rt, ba, Cg, and Tp. Groups of plants were subjected to one of the following treatments: Gibberellic acid, naphthalene acetic acid, indole butyric acid, GA-NAA, GA-IBA. Treatments were applied in several concentrations at two-day intervals. NAA stimulated root growth and stalk stiffness, but decreased branching, stature, leaf size, inflorescence size and fertility. IBA stimulated overall growth, but not height; leaves were wider, often longer, more tillers developed, they produced functional inflorescences and root growth was enhanced. GA retarded root growth and inhibited development of lateral branches. In a few cases, it increased height. Generally, effects of IBA-GA or NAA-GA were additive. br_1 / br_1 was markedly affected by GA; leaves were only 1/3 as wide as controls, plants were shorter and with culms 1/2 as great in diameter and inflorescences did not develop. nl / nl plants remained nl; ba / ba plants remained barren. Stature was only slightly modified in na_1 and na_2 plants. rt plants formed roots when treated with IBA or NAA. Tp and Cg plants behaved under effects of GA treatment as previously published; with IBA their increase in vigor was marked, while with NAA they showed few growth differences from controls.

gl