glass dishes in incubators or on a Wild temperature controlled microscope stage. Both per cent germination and pollen tube lengths were measured from photomicrographs of random fields.

Optimum temperature for per cent germination was in the range 20-23°C. Germination was low and variable above 35°C and below 15°C. Much bursting occurred at the higher temperatures. No germination took place at 10°C and below; the grains remained intact and a small bubble formed at the germ pore. If the temperature of the stage was then raised by 5C° a tube formed from the bubble.

Temperature influences the average time for germ tubes to appear--the latent period of germination. The latent period is a hyperbolic function of temperature. As the temperature was lowered below 10°C the time for germination became infinite; at an infinitely high temperature the latent period approached zero, but bursting of the grains, of course, actually terminated the curve between 35°C and 40°C.

Rates of growth of several hundred pollen tubes over periods up to 60 minutes were determined at 9 temperatures between 10°C and 45°C. Periods of maximum growth rate varied with temperature and seldom exceeded 35 min. Maximum rates of growth increased linearly between 12°C and 30°C with a Q_{10} of 2.1 and fell off rapidly below 12°C and above 35°C.

The lengths of tubes after a measured period of germination are functions of the latent periods of germination, the growth rates, and the times at which these rates level off. The average tube growing at 30°C was 1.5 X as long when it began its plateau phase of growth as the average tube length at 38°C. No significant difference was observed between those at 20°C and 30°C.

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5. Tests for chemotropism in pollen tubes.

Two methods for testing the chemotropic response of "Seneca 60" ($\underline{su}_1/\underline{su}_1$) hybrid corn pollen were tried. The first used the method of Mascarenhas and Machlis (Nature, 196:292, 1962) in which pollen and test materials were placed in depressions in a 1% Noble agar medium containing 100 ppm boric acid and 12% sucrose but no added calcium. Directions of pollen tubes were observed under a microscope.

The second method consisted of soaking Whatman 3MM filter paper discs in test material and placing one disc in the centre of a slide well containing the methyl cellulose supplemented medium lacking calcium (MGCNL 39:169 and 40:147). Pollen was shaken onto the surface after a suitable diffusion period. The pollen grains and tubes were photographed and the distance of each grain from the edge of the disc and the direction of growth of the tube relative to the disc were measured. The quantitative data from the second experiment were subjected to regression analyses.

No germination was observed in the germination depressions in agar when solutions of various calcium salts, filter paper soaked in calcium chloride solutions, blocks of agar containing calcium, pieces of style or pieces of endosperm were added to test depressions. Some germination occurred when crystals of $CaCl_2 \cdot 2H_2O$ were added to the test depression and allowed to diffuse for 17 hours, but the direction of growth of the tubes appeared to be random.

Germination was obtained around the filter paper discs soaked in calcium chloride or mashed styles and endosperm. The best results were obtained after a 40 min. diffusion period from discs soaked in 1500 ppm $CaCl_2 \cdot 2H_2O$. The analysis of the numerical data, however, indicated a random orientation of the tubes. Further details, photographs and illustrations may be found in the Canadian Journal of Botany, 45: (in press).

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6. A plant with opposite leaves.

A single plant, hemizygous for the short arm of chromosome 9 distal to but not including bz$_1$ was found in 1965 from a culture of 12 siblings to possess opposite leaves at every node and in addition twin ear shoots at each of three nodes. Prior to extensive internode elongation the plant resembled a rosette.

The morphology of the mature plant differed from a normal sib in at least two ways: a pair of leaves appeared to be inserted at each node and those leaf pairs were spirally arranged along the stem. Modifications of the tassel branch insertions were observed also. While the insertion of a pair of leaves at a node could be interpreted in terms of a long and short internodal system (as reported by Weber and Weatherwax, MGCNL 40:49, 1966) we found no evidence in our specimen to support this interpretation. The leaves do overlap one another at the node but they appear to be inserted at the same level. No evidence of two nodes was found from 100 u thick sections through a node and its two leaves. We suggest, in the absence of critical data, that two leaves were initiated simultaneously from the apex. Direct observation of the developing apex would be necessary to confirm this.

No rosettes or plants with opposite leaves have been found among 70 seeds planted in the winter crop. Several hundred kernels remain from the self pollinations.

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