(a few days later than 'GN UI #59), less viny growth habit (nearly comparable in vegetative growth and yield to 'GN UI 59) and less susceptible to white mold. Early maturing common blight and bacterial wilt tolerant lines, designated as GN-CB-BW-71-44 and GN-CB-BW-71-48 (F_6 BC_5 'GN Nebr. #1 sel. 27' (late, common blight tolerant) x 'PI 165078' (late, bacterial wilt tolerant)), also performed well and will be tested again in replicated trials in 1974. These lines are nearly as early as 'GN1140' and have a growth habit and yield level comparable to 'GN 1140' and 'GN UI #59'. It is planned to evaluate the lines in a white mold disease nursery in the field in 1974.

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EFFECT OF MODIFIED PLANT ARCHITECTURE OF DRY BEANS (PHASEOLUS VULGARIS) ON WHITE MOLD SEVERITY AND YIELD

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White mold disease, caused by Whetzelinia sclerotiorum (Lib.) Korf and Dumont - Sclerotinia sclerotiorum (Lib.) de Bary has become a major disease of Great Northern (GN) and Pinto dry beans on irrigated land in western Nebraska. Satisfactory chemical control of the disease in these varieties has not been obtained. All GN and Pinto dry bean varieties are susceptible. The effect of modification of the architecture of the bean plant on the development of white mold or on yield has received only limited attention. Several researchers have reported that determinate dry bean varieties or lines show less white mold than viny types.

We investigated the effect of modifications of plant architecture of two GN dry bean varieties, 'GN 1140' and 'GN Tara', on the severity of white mold and yield components in a field disease nursery containing an abundance of sclerotia in the soil.

The experimental design used was a split-plot with varieties as main plots, replicated five times. The four sub-plot plant habit treatments were as follows; control, support of plants on a 3-foot high wire trellis, pruning of 'runners' at the start of elongation, and spraying of plants with 20 g. actual TIBA/acre at the fifth trifoliate leaf stage. Sweet corn was also planted around the experiment to provide a windbreak and create microclimatic conditions favorable for disease development.

Severe white mold developed in the control, pruned and TIBA treated plants. TIBA treated plants were compact and dense. Trellis-grown plants had the highest total seed yield (50% higher yield than control) and only slight white mold infection. The higher total seed yield was due to increases in the yield components, number of pods per plant and weight per seed.

These results have useful implications for the genetic modification of plant architecture as an avoidance mechanism to reduce the severity of white mold. Suggested ideotypes are sturdy stiff upright determinate or indeterminate plant habits, consisting of a few main stems with long internodes, few short side branches, and small trifoliates. These plant habits should facilitate improved air circulation and better light penetration within the canopy resulting in a more rapid drying of dew-covered leaf surfaces. A determinate or compact habit per se may not lead to a reduction in disease severity. Compact dense plants, as a result of TIBA treatment, developed severe white mold, even with good apparent air circulation in the open spaces between rows. It is also possible that the TIBA treatment may have contributed to increased susceptibility of plant tissue. We have observed that the dense determinate Pinto variety 'Ouray' developed severe white mold in other field trials. A low level of white mold was noted in the indeterminate small white dry bean 'Aurora'. This observation was also made independently by Dr. Donald Wood in Colorado. Aurora has a porous canopy and possesses plant architectural features similar to those mentioned earlier which may contribute an avoidance mechanism to reduce white mold.

Some level of genetic resistance or field tolerance to the pathogen may exist in Phaseolus germplasm. We observed that Black Turtle Soup dry bean, which possesses a dense vigorous viny plant, showed only slight to a moderate level of white mold in a replicated dry bean trial while the viny GN and Pinto varieties had severe white mold. It is also possible that in other material a combination of suitable ideotype (avoidance mechanism) and genetic resistance of tissues may be involved in reducing the severity of white mold.

Chemical control of white mold on bush dry beans and bush green beans is well documented. Successful control of this disease on GN and Pinto dry beans in Nebraska in the future may depend on the breeding of ideotypes possessing some avoidance mechanism, incorporation of some increased level of genetic resistance, combined with the use of a fungicide.

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PHOTOSYNTHETIC DEPRESSION IN PHASEOLUS VULGARIS L. AFTER EXPOSURE TO COLD (5 C) FOR ONE NIGHT

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Phaseolus vulgaris L. plants exposed to 5 C temperatures for a single night exhibited severe reductions in photosynthesis the following day. The response was manifest only if the roots as well as the shoots were cooled however. Photosynthetic reductions were accompanied by a parallel drop in transpiration, and a rise in