HERBICIDES MAY PRODUCE INSTABILITY

Morphological abnormalities commonly result from use of some selective herbicides on crop plants.\(^1\) Crop strains may differ both in injury symptoms, and in yield of the succeeding crop.\(^2\) A gametocide for cotton has been reported.\(^3\) Despite this background there seems to have been no sustained study of herbicide distorted progeny. Our experiments involve 4 successive progeny reselections following a soil treatment with 2,2 dichloropropionic acid (Dalapon).

In early January 1956 about 20 acres on the University of California Agronomy Farm were treated with a commercial formulation of Dalapon for control of wild oats. After more than the normal waiting for breakdown of the product, foundation seed of California Mariout barley and Ramona 50 wheat were sown on this field in late February. These crops were never harvested for their intended use because of the very high incidence of variously dwarfed plants, polarity-distorted stems, and extreme spike malformations. Some of these are shown in figure 1. In this cold and wet soil the chemical breakdown of the herbicide was obviously retarded, and rain moved some of it to low spots where it killed all seedlings. More than 100 plants of both varieties showing intermediate malformations were harvested. Their seed set was poor.

In 1957 (T\(_2\) generation) the previous dwarfing and stem and spike distortion were repeated, but in milder form (see figure 2). There was a significant deficiency in stand establishment of most lines. A general tendency toward slight gigantism in the early tillers and sterility in later tillers was also noted. These Dalapon-induced wheat spike malformations resemble those reported by Aberg\(^1\) and those from localized aphid feeding.\(^4\) In barley no extreme forms of spike distortion were observed.


