Table 1
Hybrid W22 x W23 Seeds Started Under Alternating Conditions of 12 Hrs. Light and 12 Hrs. Dark, Then Shifted to Constant Light 108 Hrs. After Start of Germination

	Time in Hours														
	12	24	36	48	60	72	84	96	108	120	132	144	156	168	180
	L*	D	L	D	L	D	L	D	L	L	L	L	L	L	L
Wt. gain in gms.	.70	.37	.11	.17	.01	.27	.07	.44	.11	.13	.13	.04	.08	.01	.06

Table 2
Hybrid W22 x W23 Seeds Started Under Constant Light Conditions Then Transferred to Alternating 12 Hour Light and Dark Periods 108 Hours After Start of Germination

	Time in Hours														
	12	24	36	48	60	72	84	96	108	120	132	144	156	168	180
	L	L	L	L	L	L	L	L	L	D	L	D	L	D	L
Wt. gain in gms.	.94	.28	.04	.10	.05	.12	.21	.27	.24	.62	.16	.56	.05	.55	.16

*L = light period 12 hours; D = dark period 12 hours.

change in rate of water uptake takes place. After these first eight days seeds become too difficult to manage by the above weighing procedures.

Rhythmic activity such as that outlined above has important experimental implications. During certain periods of great activity in the plant, the biologist is quiescent; during the greatest activity periods of the biologist, the plant is quiescent!

B. C. Mikula

4. Antigenic substances connected with the R locus.

A fundamental assumption in biology is that genetic information must be translated into molecular information in the form of protein. Because immunological mechanisms of animals are able to detect foreign protein, laboratory animals provide a means for the detection of gene-related antigenic materials of plants. Since a great many important basic questions hinge on the ability to detect gene-related molecules, an attempt was made to see if any of the alleles of R might produce distinct, antigenically active substances. To overcome difficulties experienced by others who have used plant materials as antigens, a minimum preparation was given the plant extracts which were injected into young rabbits. Fresh roots of a W22 x W23 hybrid containing the genes $R^r r^g$ were harvested after five to six days of germination on pads soaked with distilled water. Roots were ground in normal saline with a mortar and pestle in an ice

bath. Coarse cellular material was spun down at low centrifugal speeds until the supernatant fluid could be assured of passing through a syringe. Within an hour after harvest the root extract was injected into young rabbits by two routes: one group of animals was inoculated intravenously and a second group was inoculated intramuscularly using antigen with an adjuvant. The injection program was continued eight weeks at the end of which time the animals were exsanguinated and the blood allowed to clot. The serum was collected and stored at -72° C.

Gel diffusion plates were prepared with wells from which antiserum was allowed to diffuse out against the antigens prepared from fresh roots by the method mentioned above. Two separate precipitin bands could be detected where $\underline{r}^g$ or $\underline{R}^r$ was used as the diffusing antigen. It is concluded that the alleles $\underline{R}^r$ and $\underline{r}^g$ produce antigenically detectable substances which can now be identified by means of our antiserum.

J. R. Frey
B. C. Mikula
Scott Warren

DEKALB AGRICULTURAL ASSOCIATION, INC.
DeKalb, Illinois

1. 7x7 latin square experiments for special purpose studies.

In 1963 four sets of eight 7x7 latin square experiments were planted, two sets on the Dayton, Iowa, and two on the DeKalb, Illinois, research farms. Each set of two experiments had duplicate entries. One purpose for planting this series of experiments (which will not be discussed in detail here) was to accurately measure agronomic differences between hand harvest and machine harvest methods.

A. TR vs. T Cytoplasm Comparison

In addition to the comparison between harvest methods, these experiments were designed to show differences in yield, moisture, and plant quality between sterile T-cytoplasm, and restored sterile T-cytoplasm.

In each 7x7 latin square, six of the entries were composed of three pairs of single crosses, one member of each pair being the sterile version, the other member a restorer version of the same single cross. In this latter version, the TR line was used as the female parent. For the purpose of this test, one to one segregating backcross progeny of T sterile and TR restored-sterile plants were pollinated by the same male inbred so that each pair of single crosses differs only by Rf genes and their linkage complex. It also follows that each female inbred of a pair had an equivalent amount of backcrossing. Most pairs were either in the 5th or 6th backcross generation. The 7th entry in each experiment is a standard commercial single cross hybrid with normal cytoplasm.