

5. Recessive resistance to P. sorghi.

F₁, F₂, and backcross data obtained in greenhouse tests during January, 1961, indicate that resistance to culture 928bb of P. sorghi is controlled by three independent loci in inbreds (A277 x 41.2504B)-1-47-1-1-1-1 and Midland-125-3-1-3-5-1. These inbreds are highly resistant to rust culture 928bb while F₁'s with the susceptible inbred B14 are susceptible. The highest degree of resistance appears to be due to the completely recessive condition. The proposed type of gene action is as follows:

<u>Genotype</u>	<u>Rust reaction</u>
First dominant gene	Susceptible
Second dominant gene	Susceptible in absence of dominant gene 3
Third dominant gene	Intermediate (inhibits dominant gene 2, but not gene 1)
Multiple recessive	Highly resistant.

The following data support the above hypothesis:

<u>Cross</u>	<u>No. of plants observed</u>			<u>Expected ratio</u>	<u>P Value</u>
	<u>Res.</u>	<u>Inter.</u>	<u>Susc.</u>		
(A277 x 41.2504B) x B14 F ₂	3	17	86	1:12:51	.30-.50
[(A277 x 41.2504B) x B14] x (A277 x 41.2504B)	11	27	63	1:2:5	.80-.90
Midland 125 x B14 F ₂	1	9	71	1:12:51	.10-.20
(Midland 125 x B14) x Midland 125	8	24	61	1:2:5	.50-.70

Inbreds (A277 x 41.2504B) and Midland 125 give differential and reciprocal reactions with various cultures of P. sorghi and on this basis must be regarded as having different genotypes for rust resistance.

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6. Location of genes determining resistance to Puccinia sorghi in corn inbred selection (Oh45 x W92)-2-5-2.

Studies on the inheritance of resistance to corn leaf rust, Puccinia sorghi, have demonstrated that the resistance in Cuzco,