HYBRID SELECTIONS OF OATS RESISTANT TO SMUTS
AND RUSTS

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THE development of smut- and rust-resistant strains of oats from
the cross Victoria × Richland has been reported. To obtain hybrid
populations for pathological and genetic studies of certain physio-
logic forms of crown rust and also, incidentally, to obtain strains
equally resistant to smut and stem rust and possibly with better
adaptation and greater productivity, some of the important stem-
rust resistant varieties were crossed on Bond by the senior writer in
the greenhouse at Ames, Iowa, in the spring of 1932.

MATERIALS

The crosses producing the most promising lines that are not only homozygous
for resistance to the smuts and rusts but apparently are agronomically desirable,
are as follows:

X M328 Bond (C.I. 2733) x Iogold (C.I. 2329)
X M3217 Anthony (C.I. 2143) x Bond (C.I. 2733)
X M3218 Bond (C.I. 2733) x Iowa No. D69 (C.I. 2463)
X M3214 Green Russian sel. (C.I. 2344) x Bond (C.I. 2733)

Bond was introduced from Australia in 1929. Its history, classification, high
resistance to crown rust, and probable agronomic value have been reported by
Stanton and Murphy. Bond was nearly immune from all except 2 of 22 physio-
logic forms of crown rust (Puccinia coronata avenae Eriks.) collected in the
United States, Canada, and Mexico in 1931–34, inclusive. It was susceptible to
rare forms collected in Louisiana and Arkansas only. It is resistant also to collec-
tions of loose and covered smut of oats, Ustilago avenae (Pers.) Jens. and U. levis
(Kell. and Sw.) Magn., respectively, obtained from the corn belt, although it has
not been uniformly resistant to all collections apparently representing distinct
races of the oat smuts from other regions. Bond has an excellent straw, but its
complete susceptibility to stem rust (Puccinia graminis avenae Eriks. and Henn.)
and the pronounced sucker mouth type of hilum make it of doubtful agronomic
value. Iogold, Anthony, Iowa No. D69, and Green Russian selection (C.I. 2344)
are highly productive, stem-rust resistant varieties, the first two being widely
grown and commercially important. All four varieties, however, lack resistance
to both smuts and to certain important physiologic forms of crown rust. Iogold
has shown no resistance to any of 37 forms of crown rust collected in 1927-35.

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