

REACTION OF MAIZE GERMPLASM AGAINST RUST DISEASE AT KALIMPONG

Of the three rusts of maize, common rust caused by *Puccinia sorghi* Schw. is far more important in India. The rust is recognized by circular to elongate, cinnamon brown powdery pustules (uredenia) scattered over both the surfaces of the leaves. As plants mature the pustules become brownish black owing to replacement of the red urediospores by black teliospores. Rust pustules may appear on any of the above ground part of the plant, but they are most abundant on leaves.

A survey of the diseases of maize at Kalimpong area for the last five years revealed that rust of maize caused by *P. sorghi* is prevalent in this area and the rust appears every year in the uredial stage on the host surface during June and July producing its telial stage towards the later part of the growing season. Due to regular appearance of this rust a large number of maize germplasm were evaluated against natural incidence of this rust at State Agriculture Farm, Kalimpong during the kharif season of 1976 and 1977.

The seeds were obtained from the Project Coordinator (Maize) I.A.R.I, New Delhi 110012. For each germplasm two rows of seeds were sown under natural field condition with the application of recommended dose of NPK. Some 373 different lines were screened during 1976 and those found resistant that year included for further confirmation in the testing programme of the year 1977 along with other unscreened lines. Scoring of the disease was done on the basis of 1—5 scale on natural infection and the disease indices are detailed below.

- 1—*Very slight to slight infection* : One or two to few scattered lesions on lower leaves
- 2—*Light infection* : Moderate number of lesions on lower leaves only
- 3—*Moderate infection* : Abundant lesions on lower leaves ; few on upper leaves only
- 4—*Heavy infection* : Lesions abundant on lower and middle leaves, extending to upper leaves

5—*Very heavy infection* : Lesions abundant on all leaves ; plant may prematurely dry or killed.

The germplasms tested were grouped into six categories according to the intensity of infection, namely (i) Immuned (no infection), (ii) Resistant (Disease index 1.0), (iii) Moderately resistant (Disease index above 1.0 to 2.0), (iv) Moderately susceptible (Disease index above 2.0 to 3.0), (v) Susceptible (Disease index above 3.0 to 4.0) and (vi) Highly susceptible (Disease index above 4.0 to 5.0).

Out of different lines tested 149 lines developed rust infection. Their reactions are detailed below.

Moderately resistant : Kisan F. S. —12, —13, —17, —20, —28, —47, —51, —58, —123, —162, —201 ; Kisan H. S. —6, —29, —41, —42 ; Kisan Vikram, J₁ (Arr₂) F. S. —1, —2, —3, —4, —8, —10, —11, —15, —19, —20, —21, —22, —23, —38, —39, —41, —45, —46, —49, —50, —55, —56, —58, —59, —61, —62, —65, —66, —67, —68, —71, —72, —79, —81, —82, —83, —88, —89, —94, —95, —100, —108, —111, —73, —202 ; J₁ (Arr₂) H.S. —6, —8, —13, —15, —22, —23 ; J₁ (Arr₂) original, YUZPTC —5 (F₂), Local —(Ad-e-cuba), HP-43, —75, —95, —99, —123, —132 ; (DT 23 x DT 17) x (MR 21 x SP 2091), NaHo Comp, Carribean Comp. DMR, Bosanian Dent 460, E. H. —2025, —2035, —2085, —2300, —2380, —2420, —40047, —44972, —200174, —400175, —400575, —400375, —403374, —403974 ; J43 x Exp. 10-5-≠≠≠≠≠≠, J607 x Exp. 10-5-≠≠≠≠≠≠, J 617 x Exp. 10-5-≠≠≠≠≠≠, (CM 202 x CM 111) x Ant. Gr. II, VL —42, —71, —73 ; MMH —5, —6 ; Hun 123—Zone I/Ganga Safed—2 x MSC 75—Zone II x III/Deccan—IV, D-747, —751, —765 ; A 135 PL.LTJ x PP1 Baja, Syn Var.—105, —113 ; Hybd —4, —≠≠≠≠, VC —69, M₁, M₂, Vijay Composite and Ganga Safed-2.

Moderately susceptible : HP-66, —79 ; Montenegrin Flint—41, ; E.H. —45072, —439673 ; (CM 202 x CM 111) x Good Girth Er₂, (CM 202 x CM 111) x Tad 12—≠≠≠≠≠≠, J 604 x Exp. 10-5, J (W), D-44, DH-401—≠≠≠≠≠≠, Safeda, L3 (Limms), Varietal cross—80, H-62, 211 ; J₁ (Arr₂) F. S. —24, —31, 36, —54, —73, J₁ (Arr₂) H. S.—11 and Local Variety.

Susceptible : Montegrin Flint —50, Kisan H. S. —49, J₁ (Arr₂) F. S. —35 and Ganga-5.

The remaining lines under trial condition showed either total immunity or highly resistant reaction. The different lines reacted differently to rust infection.

The disease index also did not show any uniformity within the same line suggesting heterozygosity in respect of discase reaction.

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