



Pearl Millet 'HHB 67 Improved' - Downy Mildew Resistance

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In pearl millet, resistance to downy mildew disease caused by *Sclerospora graminicola* is crucial for preventing dramatic yield loss. Resistance conferred by the original 'HHB 67' hybrid was quickly broken down; therefore, disease resistance was transferred to the original parent lines to develop 'HHB 67 Improved'. Disease resistance was incorporated into the original male parent, 'H77/833-2', from the donor line 'ICMP 45' by marker-assisted backcrossing. The original female parent, '843A/B', had disease resistance transferred via conventional backcrossing from 'ICML 22'.

Healthy pearl millet panicles grown in Bawal, India



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PROJECT GOALS

- ✓ Improve downy mildew resistance in HHB 67

Problems Addressed

In the 1960s, the release of the first pearl millet hybrids significantly increased yield throughout India; however, the success of pearl millet hybrids was short-lived as downy mildew attacks reduced the country's harvest from 8.2 to 4.6 million metric tons. Subsequent hybrid releases gradually raised production until 'HHB 67' dramatically increased the harvest to 9 million tons. 'HHB 67' was still susceptible to downy mildew disease, which could result in significant yield loss in the case of an epidemic; such attacks had the potential to reduce yield by up to 30%, which could result in \$7.7 million loss of 'HHB 67'.

Solutions Developed

ICRISAT invested in conferring downy mildew resistance to 'HHB 67' to create 'HHB 67 Improved'. To confer resistance, elite donor lines were backcrossed on to its original parental lines, 'H 77/833-2' and '843 A/B'. Donor lines 'ICMP 451' and 'ICML 22' provided a great base for disease resistance. 'ICML 22' demonstrated 95% resistance against aggressive downy mildew disease populations in India. In addition to successful greenhouse testing, farmers also expressed preference towards 'HHB 67 Improved' thanks to the additional increase in stover yield.



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