

Development of inoculation method for screening of true seedlings of sugarcane against smut

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Australian Government

Sugar Research and Development Corporation

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- Approximately 70% of the productive varieties in Australian were susceptible to smut in 2006
- Research showed that 10-15% of progeny from two highly susceptible parents may be resistant to smut (Chao *et al.*, 1990).
- A program has been undertaken by BSES to recover smut resistant clones from high value smut susceptible crosses.
- As part of the program approx. 40,000 seedlings from susceptible crosses are being screened for smut in two phases.
- There is no accepted inoculation method to screen true seedling against sugarcane smut.
- The aim of this research was to develop an inoculation method for true seedlings which would provide a reliable indication of the field resistance.

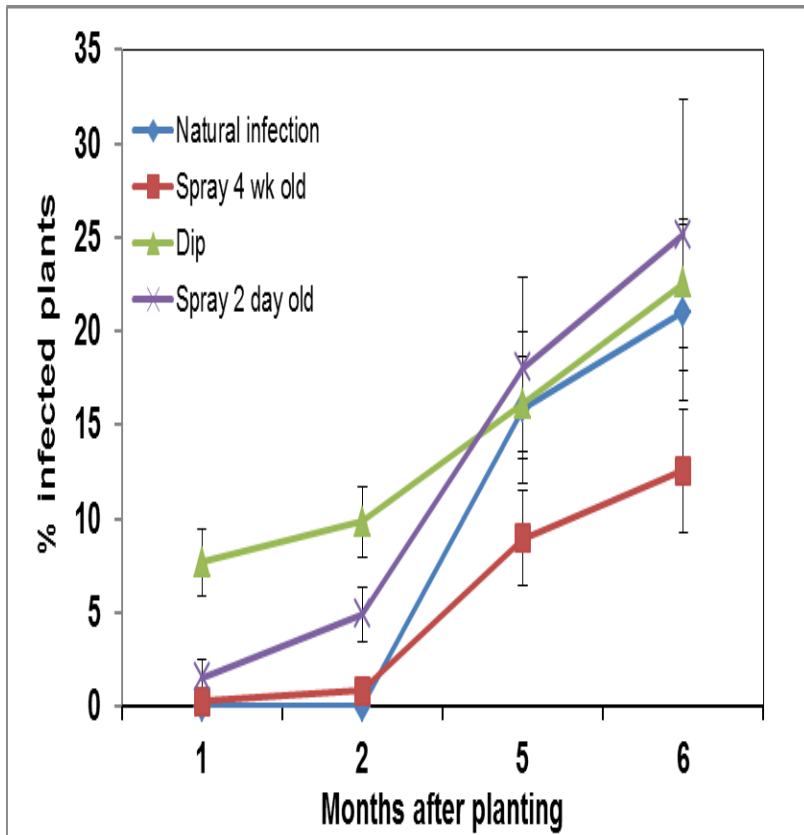
- Two experiments were established in 2007 and 2009

The treatments were

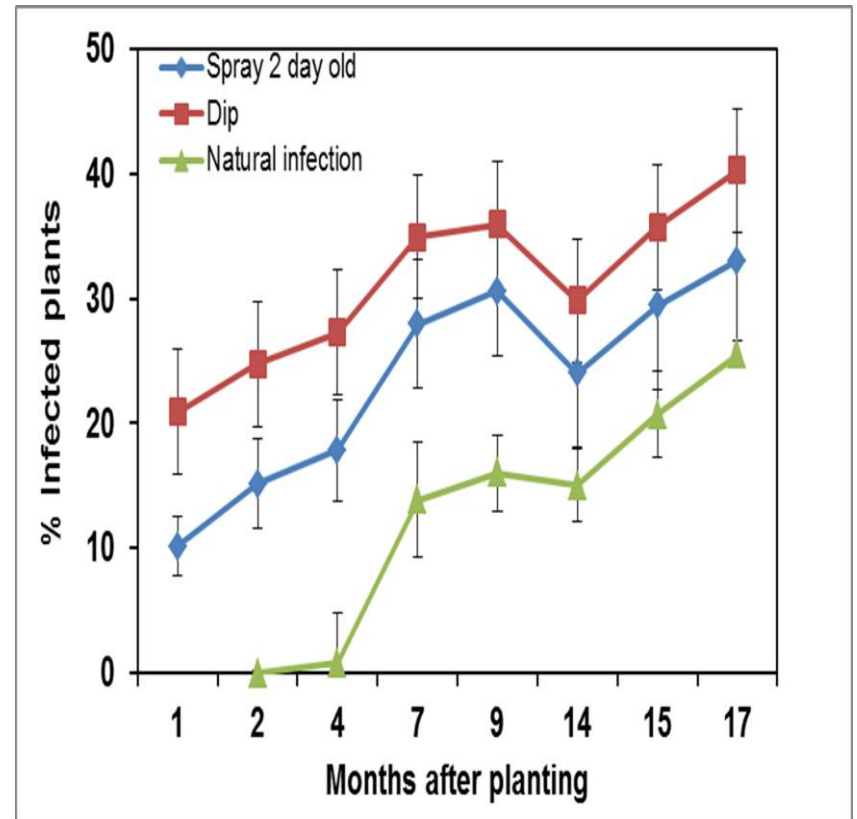
1. dip inoculation
 2. trim and spray of 4-week-old seedling with smut spore suspension,
 3. natural infection
 4. spray germinating seedlings
- Fifty seedlings from 12 families with three resistant categories, susceptible, intermediate and resistant were included in each method



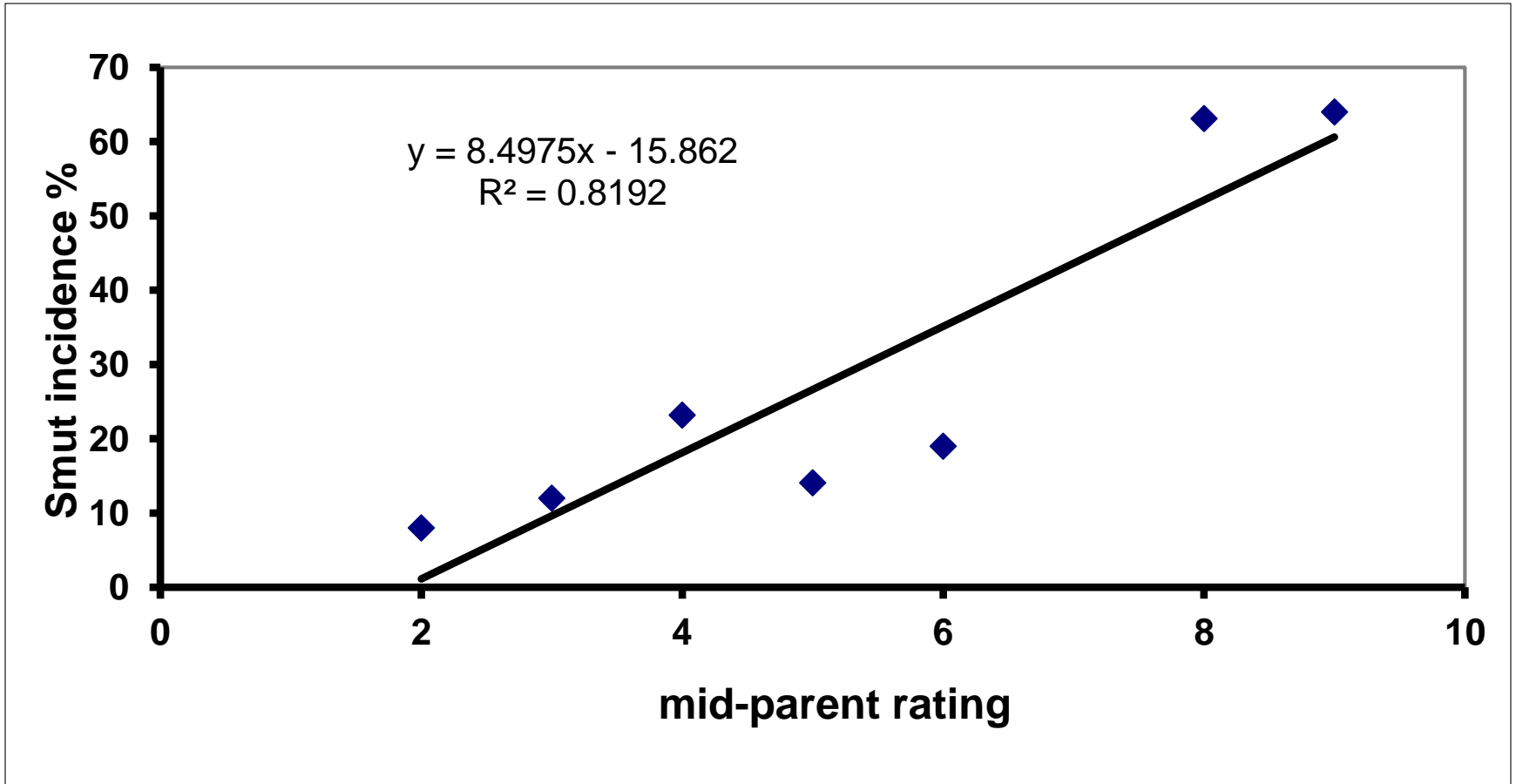
Seedling inoculation



2007



2009



- inoculation was the most effective for screening true seedlings against sugarcane smut
- There was a highly significant correlation ($r=0.75 - 0.91$, $<P0.001$) between percent smut infected seedlings and mid-parent rating in the dip inoculation method (Fig 4). Correlation coefficients were less for other methods, (i) $r=0.33$ for spray 2 day old seedling, (ii) $r=0.68$ for natural infection, and (iii) $r=0.32$ for spray 4 week old seedlings.
- Dip inoculation method has been adopted for screening sugarcane seedlings against smut.