

# Mechanism of resistance of Australian sugarcane varieties against smut

BSES Limited: Shamsul A Bhuiyan, Barry J Croft,  
CSIRO: Karen Aitken



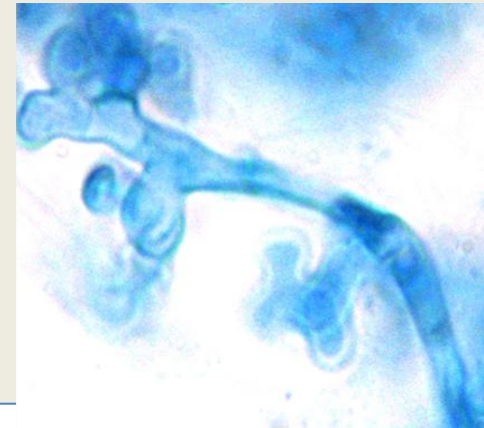
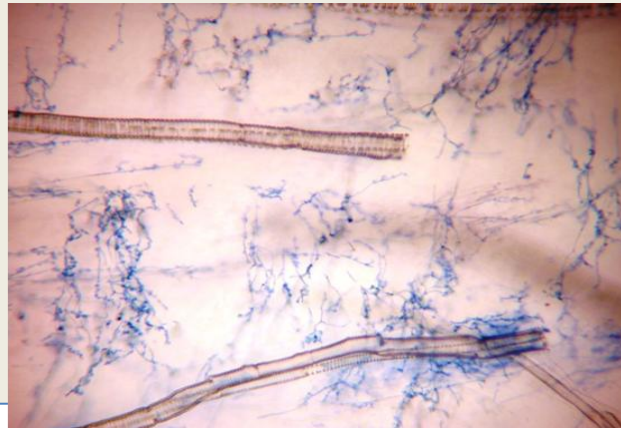
Australian Government

Sugar Research and Development Corporation



BSES Limited

- Sugarcane has types of resistance mechanism against smut
  - External or bud scale resistance
  - Internal resistance



- Understand the resistance mechanisms of some important commercial varieties,
- Understand the relationship between age of bud and smut resistance, and
- Identify the gene(s) involve in the resistance

## ❖ Mechanism of resistance

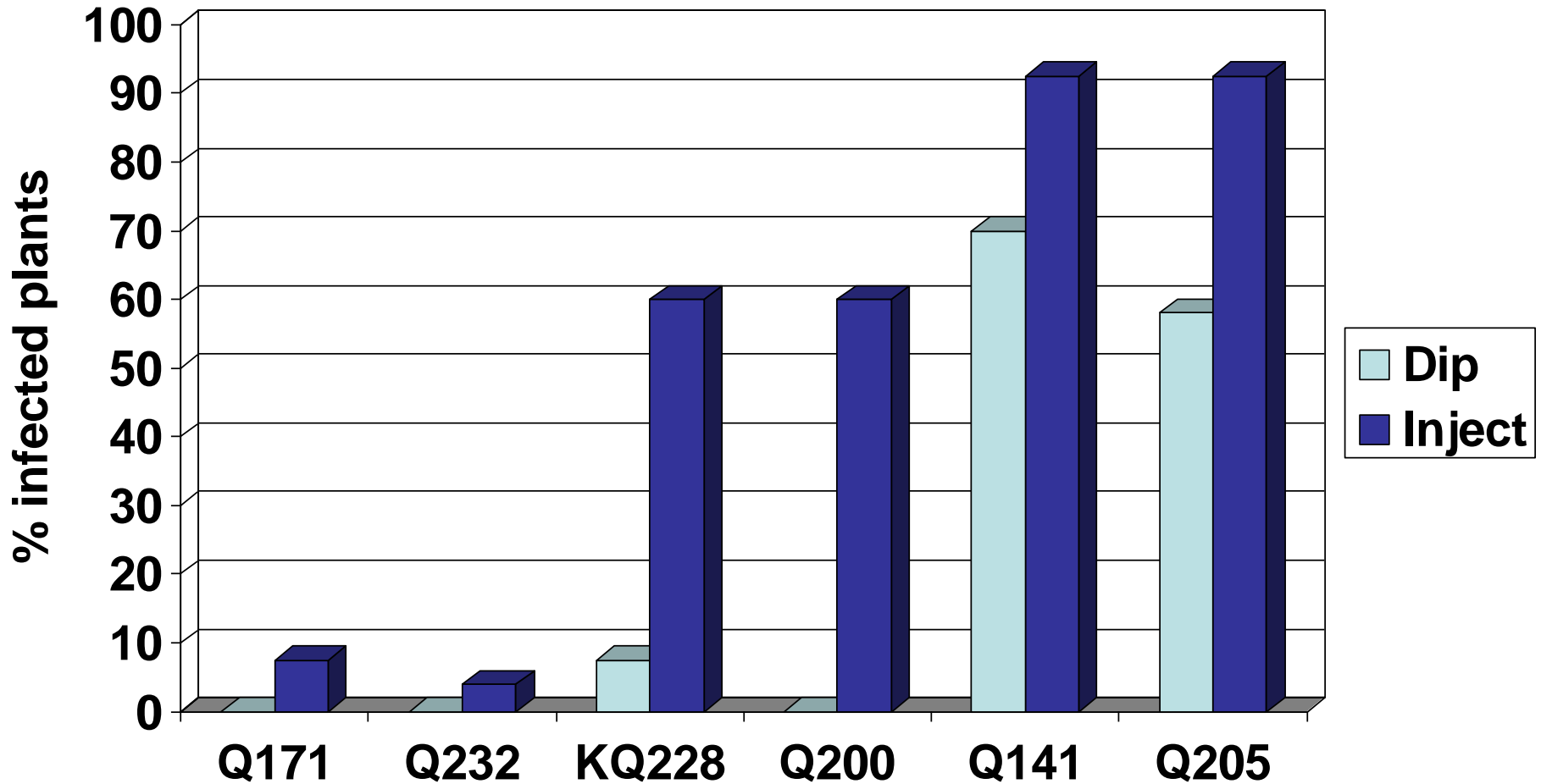
- Dip inoculation
- Injection

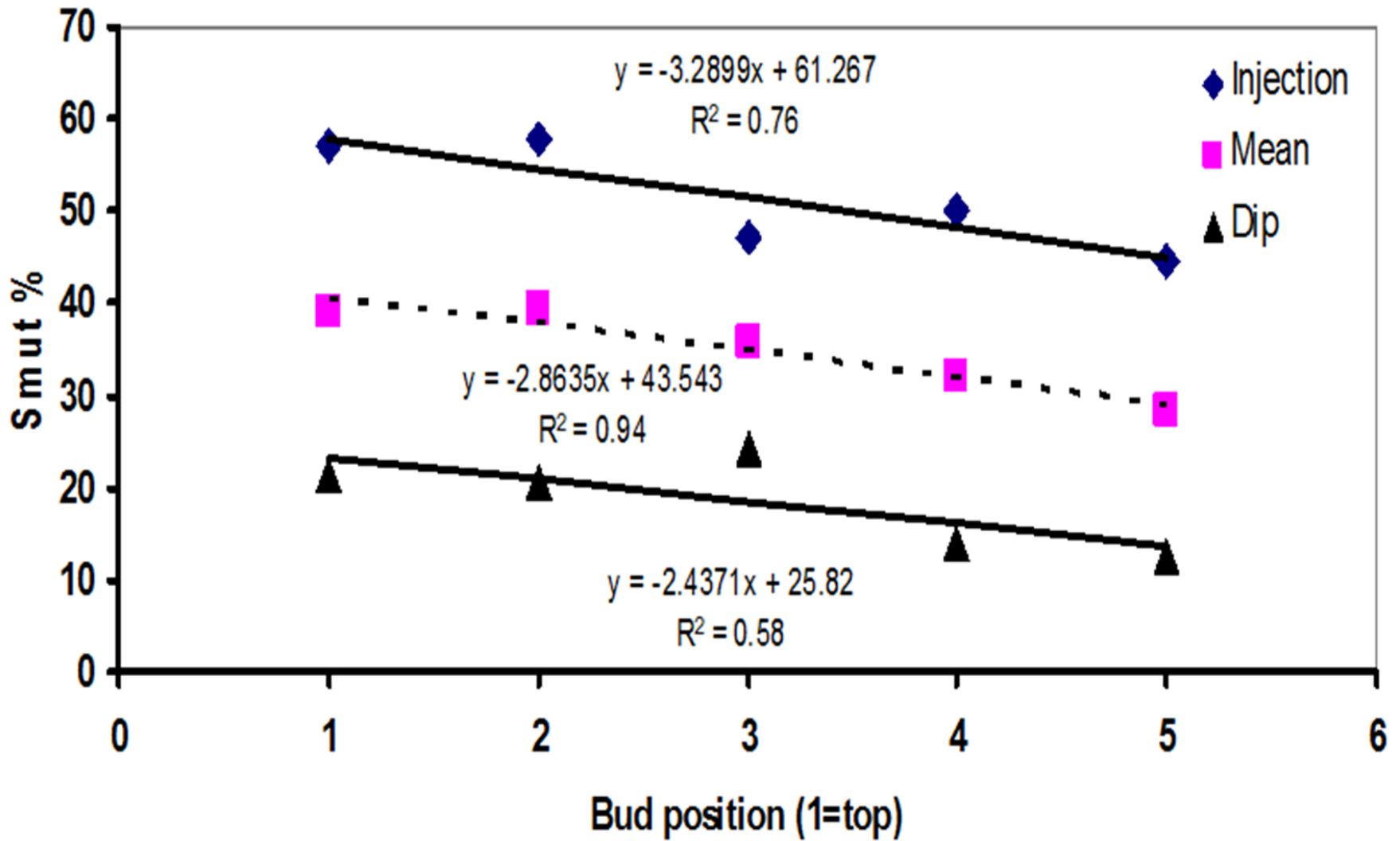
❖ Bud positions – cut a stalk into 10 one-eye-sets, from top to bottom, kept them separately in 5 bags

❖ Inoculate the progenies from crosses between an internal and an external resistant parents for their disease resistance mechanisms using dip inoculation and injection method



## Injection bypasses bud scales, resistance in some varieties breaks down





- This research suggested that the majority of the Australian commercial varieties possessed external resistance mechanisms.
- Age of the bud has significant effects on smut infection. Younger buds were more susceptible to smut compared to older bud.
- A study of progeny from a cross between a cultivar that contained internal resistance and a cultivar with only external resistance suggested major genes were responsible for internal resistance
- **Future:**  
2012 SRDC funding for using new molecular and histopathological techniques to elucidate the external and internal resistance mechanisms identified in the current studies.