

## NSW Plant Breeding Program

The SRA Plant Breeding Program in NSW targets the needs of the NSW sugar industry. The program optimises the selection of both 1- and 2-year varieties by inter-linking with the Southern program based in Bundaberg and through a specific NSW 2-year cropping trial program.



**Far left:** NSW variety team  
Technician: Michael Grogan  
Breeder: Roy Parfitt  
Variety Officer: Anthony Cattle

10 new varieties have been released in NSW since 2010 from the SRA breeding program.



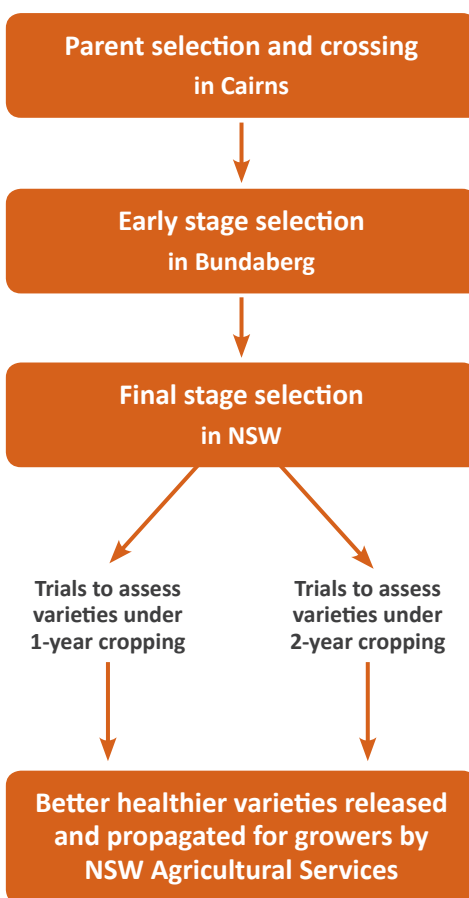
Female and male flowers are positioned in a 'lantern' to facilitate pollen transfer and prevent contamination.



Assessment trials including the most promising clones are planted in NSW field conditions for both 1- and 2-year cropping.



Varieties are screened for disease resistance by SRA Pathologists.



Seedlings are propagated from seed collected from the crossing and planted into the field.



Assess cane yield with harvesters, weighing equipment and CCS laboratory.



Better healthier varieties are approved for release and propagated for growers by NSW Agricultural Services.

## NSW Plant Breeding Program

The SRA team is focused on providing an efficient and effective Plant Breeding Program to the NSW industry.  
Here are some of the changes implemented recently:



An understanding of the unique NSW growing conditions is required to provide suitable varieties. Therefore, active communication has been strengthened between the Plant Breeding team and NSW growers and NSW Sugar.



Better statistical analysis methods to assess varieties in both 1- and 2-year cropping trials allows new varieties to be compared to the current standard industry varieties.



An increase in the size of the NSW trials, with 150 new varieties now coming into NSW for assessment every year.



2-year cropping trials assess the performance of varieties with proven 2-year parents. The top performing varieties from the first plant crop harvest results from the 1-year cropping trials also are assessed in 2-year cropping trials.



2-year cropping varieties are assessed over 2 crop cycles at 4 locations in NSW testing their performance under different soil types, management practices and micro-climates.



The top performing 1-year varieties from the first plant crop harvest results each year are also repeated in a second set of 1-year cropping trials at different locations to collect more productivity data before release.



The SmutBuster program has doubled the number of early stage varieties as a response to the Smut outbreak.



The time from initial crossing to release of a new variety to the industry has been reduced to 10-11 years for 1-year crops and to 13-14 years for 2-year crops.



Varieties advancing through the selection program are screened for disease resistance to smut, Fiji leaf gall, leaf scald, mosaic and red rot at Woodford by SRA pathologists. This means disease ratings are available early before variety release decisions are made.



The NSW breeding program identifies and selects parents for crossing with genetic traits that will enhance the breeding for NSW challenges. These parents come from the vast SRA germplasm collection of old and current varieties as well as wild and foreign varieties.



The SRA variety exchange program exchanges varieties with 17 countries around the world, including Brazil and the USA. These varieties are included in assessment trials in NSW. They are also used for parents in the crossing program, providing valuable traits.



Wild species of cane, closely related to the domesticated cane cultivars, have been used in the production of hybrids to capture valuable traits such as vigour, ratooning ability and disease resistance.



The program is producing 1- and 2-year varieties with good performance. SRA1, SRA2, Q240<sup>Φ</sup>, Q254<sup>Φ</sup>, Q255<sup>Φ</sup> are examples of recent releases. High performing varieties are coming through the NSW selection system as well as from other regions to be released in the next few years.