

Variety management – disease risk

Well before growers prepare to plant, they should begin planning their variety selection and management on the farm. This task can be complex as there are many opportunities and risks to consider.

Apart from selecting new varieties for high yield, CCS, ratoonnability and suitability to the soil type in a block, there are two other major considerations for a grower to address when making these decisions:

1. How much risk does my farm have from relying too much on one or two varieties?
2. What varieties have resistance to diseases prevalent in my region?

Why it's important to consider over reliance on one variety

A grower's variety selection plays an important role in improving productivity and managing the risks of disease epidemics.

The Australian sugarcane industry has experienced regular disease epidemics that have been associated with the over-planting of one variety in a region.

When one variety has significantly better productivity than alternative choices, growers make a decision to accept the risks associated with over-reliance on this variety to reap the gains from the extra productivity.

However, over time, diseases can reappear or transform into new strains. Together with exotic pests, they can have a devastating impact on yields when farms or regions are dominated by one variety.

That situation was starkly illustrated when a new strain of orange rust caused major losses to the Australian industry.

Past epidemics have included:

- Fiji leaf gall which reappeared in the Bundaberg/Isis region in 1969 after it was thought to have been eradicated from Queensland. It spread into NCo310 in the southern and central districts when NCo310 comprised more than 70% of the crop.

- Brown rust was found in Australia for the first time in 1978, and the previously unidentified disease, pachymetra root rot, was discovered in North Queensland in the late 1970s. These two diseases attacked Q90 in that region, when it reached 90% of the crop and the impact was significantly detrimental to profit for the whole region.
- Orange rust, a disease thought to be of no economic importance, devastated Q124 in 2000 when that variety was 87% of the crop in the central region and 60% of the crop in the Herbert and southern regions.
- Sugarcane smut was found for the first time in Queensland in 2006. Smut spread rapidly to all regions where it attacked many widely-grown varieties such as Q157, Q166^{db}, Q174^{db}, Q205^{db}, Q207^{db} and Q209^{db}. In most regions, smut-susceptible varieties contributed 70-80% of the crop in 2006 when smut was first found.

SRA advice is don't plant more than 40% of the farm to one variety.

Why it's important to assess your farm's risk of disease

It pays to be aware which diseases may be a risk to your farm. Diseases that reduce yield will lower profit.

Pachymetra, for example, has contributed to industry-wide losses of between 15-35% depending on the level of the disease and the resistance of the commercial varieties grown (Magarey *et al.*, 2002).

In some cases, variety selection can manage disease impact. The SRA breeding and selection program has a strategy for developing varieties that have resistance to some diseases.

The diseases that can be managed by growing resistant varieties are listed in Table 1 overleaf.

SRA advice is that growers should select varieties that have resistance to the diseases that occur in their regions and do not be over reliant on one variety.



Above: Sugarcane smut trial at SRA Woodford.



Above: Priyanka inoculating setts with smut.

Table 1: Sugarcane diseases that can be managed by choosing the correct variety.

Leaf diseases	Whole-plant diseases	Soil-borne diseases
Brown rust	Chlorotic streak	Pachymetra root rot
Orange rust	Fiji leaf gall	
Yellow spot	Leaf scald	
	Mosaic	
	Red rot	
	Sugarcane smut	

Varieties are also rated for resistance to ratoon stunting disease (RSD) but regularly obtaining approved seed cane or tissue culture and good hygiene can prevent losses from this disease even in susceptible varieties.

Using other control measures to prevent losses from diseases, if available, gives growers a wider choice of varieties.

QCANESelect™ has a whole farm plan section that can assist growers to determine their current variety mix and disease risks associated with the current mix of varieties.

It also helps growers develop a plan to manage risks from diseases by selecting varieties that will maximise profit but have risk profiles set by the grower.

If you would like to learn more about QCANESelect™ whole farm planning contact Roderick Fletcher PEC Development Officer Varieties.