

Soil fumigation lifts potato yield, quality

POTATOES SA

By ROBBIE DAVIS, CEO

LAST month, a group of Australian and New Zealand potato industry representatives travelled to Bangor, in Maine, United States, and Woodstock, in New Brunswick, Canada, to study processing potato production using Chloropicrin soil fumigation.

The trip was a partnership between A-Gas Rural and Potatoes SA investigating how Australian potato growers could benefit from a better understanding of soil fumigation to manage soil pests and diseases.

This region of the world is the birthplace of McCain Foods and most potatoes grown are for the french fry market. In fact, one in every three french fries in the world is a McCain fry.

The potato delegation, hosted by TriCal USA, which undertakes soil fumigation in North America for potato producers, was guided by technical expert and research director Chad Hutchinson.

Potato yields have been decreasing and tuber weight has been generally low. This means primary producers' earnings have been gradually decreasing and processor access to high quality potatoes has been restricted.

To arrest the trend, TriCal and the larger processors have collaborated to undertake agronomy trials.

Soil fumigation is a relatively new management technique for the processing potato producers in this region, with trials being conducted for the past five years only.

As a result of the successes, the potato processors are incorporating this technique into all of their farms and training their contract producers. It appears that soil fumigation can increase yields and quality dramatically, allowing for more cost-competitive production.

A highlight of the trip was visiting trials on the properties of individual primary producers in both Canada and the US with 200 hectares to 400ha of potatoes.

North American industry

Ground is cultivated, fumigated with Chloropicrin and hilled into rows in September to mid-November.

In mid-November to April, the soil freezes to a depth of 1 metre and air temperatures can drop to -30 degrees Celsius.

In May, once the soil thaws, the rows are planted with certified seed potatoes.

Sixty per cent of potato crops are rain grown with an average in-crop rainfall of 380 millimetres to 508mm.

Soils are ex-glacial in origin, consisting of loam with small to large fractured rocks scattered throughout. Soil depth is relatively shallow at 15 centimetres to 45cm.

Harvesting occurs from September to October. Harvested potatoes are stored on-farm for up to 12 months by the producer at their expense. The longer the storage, the higher the price paid by the

The voice of the potato industry value chain

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processors to compensate the grower.

Potatoes are rotated every five years with cereal and pasture in between.

Pests and diseases
Nematodes linking with root fungus Rhizoctonia (a pathogen of roots inhibiting water and fertiliser uptake).

Verticillium fungus is a major problem towards the end of the plant lifecycle and causes premature plant death and an inability to fill the tubers to maximum potential.

Common scab is largely responsible for quality downgrades through skin blemishes.

Soil fumigation benefits

Consistently delivers yields from 60 tonnes/ha to 66t/ha.

Breakeven yield is considered to be 35.6t/ha. Increases tuber size and quality via cleaner skins. Wastage is less than 20pc.

Potato rotations are compressed.

Increase in 123,000 tubers set/ha.

Common scab is depressed while Trichoderma and Streptomycetes populations are maintained.

Lessons learned
Australian potato production suffers from similar pests and diseases.

Australia utilises a SARDI-

developed DNA soil test (Predicta PT) allowing prescriptive fumigation.

Australian and North American producers take three years to fully implement fumigation from first trialling to full implementation.

Potato yields can be doubled and quality can be improved.

The North American team will visit Australia and New Zealand at the end of the year.

It is anticipated that fumigation trials will be established in SA so that potato producers can see first-hand the economic benefits of new fumigation products and techniques that are available.