

KEEPING SCOTTISH SEED CLEAN

By Dr Jenny Ekman

Another important role of SASA is to act as the Certifying Authority for seed potatoes. They also manage and administer the Seed Potato Classification Scheme. In this, they perform a role similar to our own AuSPICA, but are Government based.

In Scotland, all stages of seed production are regulated. These rules are stricter than countries within the European Union and certainly contribute to Scotland's excellent reputation; only the highest quality pre-basic and basic classes of seed are produced here.

Land must be tested and found free of potato cyst nematode before planting any seed crop. Rotations of seven and five years are mandated for pre-basic and basic category seed potatoes respectively, with virtually all paddocks de-stoned to ensure perfect soil conditions.

As in Australia, crops are regularly inspected for symptoms of virus, bacterial diseases, or failure to grow true to type. SASA employs around 80 inspectors, supervised by 30 Agriculture Department staff. Every seed crop is inspected at least twice, with officers searching for symptoms of virus, blackleg, varietal discrepancies, or other issues suggesting the seed is not as it should be.

New inspectors go through a rigorous seven-day training programme. Even existing inspectors need to undergo four annual days of refresher training. This training is conducted at the SASA Gogarbank Farm and – lucky me – was in progress at the time of my June visit.

The training plots are truly an amazing thing to behold. The site has over 3,000 individual plots with more than 1,200 potato cultivars, 150 examples of off types, 150 examples of viruses and mixtures of diseases with other disorders, including herbicide injury.

I was shown around by Dr Triona Davey, Head of SASA's Potato, Virology and Zoology, as well as the SPCS and Export Manager John Ellicott.



The Seed Potato Certification Scheme Inspector training plots at SASA's Gogarbank Road farm. Each tag indicates a different cultivar or other treatment.

"What we've got here are plots with all the varieties that are commercially grown in Scotland," explains John. "And these are our new inspectors. This year we've got 27 doing the course. They're a mixture of temporary summer staff and permanent staff who also do other jobs - such as inspecting cattle."

"New inspectors have to be able to identify the top 30 varieties by looking at the foliage alone. They also need to recognise symptoms of key diseases and disorders. Next Tuesday the returning inspectors come back for their refresher, and some of them can recognise up to 1,000 varieties! Knowing what each variety is meant to look like means the inspectors have the skills to spot differences, diseases, and rogues in the crop."

The trainees are quizzed daily to check how well they are going with their variety recognition skills. To me all the plants look a bit the same, but John is a great teacher.

"So this is Maris Piper, which was our biggest variety last year. And this is Cara. They're both lime-green on top, but Cara looks more like a palm tree and Piper is a bit more coarse, corrugated even. Hermes, the leaves tend to turn over when it's windy, as the stems are a bit twisted, so you see the pale underneath."

Triona helps as well.

"Desiree, Rooster and Lady Rosetta are the only red varieties, so have red stems. Rooster has the darker green leaves. Then there's Innovator which

has stiff terminal leaves a bit like a shuttlecock," she explains.

Incredibly, I find I can soon tell the difference between the shuttlecock and the palm tree. However, even a seasoned inspector can find themselves duped by unusual rogues.

John tells the story.

"We had a case a few years ago where the entire crop was affected. It was an unusual variety the inspector hadn't seen before. It was only after two years multiplication that somebody, just by pure chance, knew the variety and said, this looks funny. Even though an initial DNA test came back as the correct variety, a small variation was picked up. That meant the crop could not be used for seed."



Dr Triona Davey (left) and John Ellicott (right) teach me how to tell my shuttlecocks from my palm trees.

ABOUT THE SCOTTISH AGRICULTURAL SCIENCE AGENCY

SASA is a division of the Scottish Government Agriculture and Rural Economy Directorate. Their primary role is to provide scientific services and advice in support of Scotland's agriculture and wider environment.

SASA occupies a world class laboratory, glasshouse and experimental farm facility on the outskirts of Edinburgh with a community of 100 scientists and their support staff.

More information available here:

<https://www.sasa.gov.uk>

Even more important is recognising the early signs of virus infection.

“You can see the leaf rolling at the bottom of the plant” observes John “then there’s the shape of the whole plant. It can go a bit star shaped, pale, even hungry looking. You’ve got to have your wits about you.”

The demonstration plots include so many cultivar plus virus combinations, and sometimes multiple viruses, that it’s hard to get your head around. Inspectors also need to check for aphid vectors; if they exceed specified counts, then the seed may have to be tested for virus after harvest.

Detecting bacterial infections is also important. The bacteria block the vascular system, so the plants look soft and slightly wilted. This becomes most obvious under wet conditions.

“You can see it at the base there” says John, “even easier if you pull the plant out.”

Then there are mutations caused by herbicide damage. These can easily look like a virus infection or a cultivar variation. However, in this case the crop may be able to grow through normally in the following generation, still producing good quality seed.

Being able to recognise the difference between symptoms, and having the

testing service to back it up, can be the difference between a profitable crop and one that’s dumped.

I came away with huge respect for the job seed inspectors do. The amount of knowledge they must keep in their heads, as well the different cultivars, diseases, and growth abnormalities they must be familiar with – it’s quite a challenge.

Photographs, videos, diagrams have all been tried, but nothing is able to replace experience. Perhaps as John said, the best way is not to overthink it, but use first impressions.

One thing is sure, this is not a job that’s going to be taken over by AI any time soon.



PVY symptoms in cultivars Marfona (left), Charlotte (centre) and Desiree (right).



Symptoms of damage by the herbicide Aminopyralid (left) and blackleg disease (right).