

**WRITTEN QUESTION TO THE MINISTER FOR PLANNING AND ENVIRONMENT
BY DEPUTY M. TADIER OF ST. BRELADE
ANSWER TO BE TABLED ON TUESDAY 28th APRIL 2015**

Question

Could the Minister provide a breakdown of the 4 categories of potato fields in terms of Potato Cyst Nematode (P.C.N.) levels; explain how those levels compare with acceptable and ideal P.C.N. established benchmark levels elsewhere, and what steps the Minister is taking, if any, to reduce the number of fields with high P.C.N.?

Answer (A)

Potato Cyst Nematodes (PCN) is a type of eelworm that invades potato roots to feed, is a serious pest of potato crops world-wide and can cause significant loss of yield. Due to its encysting nature it has the ability to survive in soil for many years, multiplying rapidly when a new crop of host plants is planted

In Jersey, PCN has been present in the soil for decades, with levels increasing as a result of cropping practices. All Jersey potato land sampled has some level of PCN. It is advised, and part of many super market assurance protocols to justify pesticide application, that land planted with potatoes should be tested for PCN before planting to determine pest levels and damage risk. After testing/analysis PCN present in soil is categorised as follows:

Category	Eggs and/or larvae per gram of soil	Interpretation
1	Not found	Low risk but does not imply absence – nematicide treatment not required.
2	Low 1 - 5	Use of nematicide is unlikely to be worthwhile where a crop of early Royals is to be grown.
3	Moderate 6 - 60	Nematicide is recommended to protect yield loss. If an alternative less heavily infested field is available it should be used.
4	High > 60	Cropping with potatoes not advised. The use of a nematicide may give an acceptable yield.

- At low levels (Cat 1) PCN is tolerable
- At medium levels (Cat 2 & 3) it can be partially controlled through a range of measures including variety resistance (excluding Jersey Royal), rotation of crops to break multiplication cycle and induce natural decline and soil applied nematicides (substance or preparation used for killing PCN).
- At very high levels (Cat 4) yield can be severely affected and poor potato skin finish can render the crop unmarketable.

The table below represent the trend in PCN categories in Jersey from 2002 to 2016.

Presence of PCN in Jersey soil				
	Category			
	1	2	3	4
2002	14.6%	68.2%	16.2%	1.0%
2014	16.4%	37.4%	37.0%	9.2%
Projected 2016	11.0%	33.0%	44.0%	12.0%

The table above confirms that Category 1 and 2 soil is falling, while Category 3 and 4 are rising. The increase of PCN in Jersey soil is attributed to annual cropping practices without rotation, the revocation of approved pesticides, and insufficient voluntary control and dumping of waste on land by the industry.

Jersey vs. Europe

Results from the last European PCN Survey showed that PCN is widespread across the EU, but not present in Austria, Estonia, Czech Republic, Hungary, Malta, Luxembourg and Romania. The incidence was 9.1% of area sampled for the EU as a whole and 11.6% in member states where PCN was present, but it is increasing as a pest of concern.

In Jersey PCN is present in 100% of samples and at higher levels than other jurisdictions. Until the last decade these high levels were of less concern as control products were available and the short Jersey Royal growing season meant crops were dug before damage occurred (12 weeks). However, the list of approved control products has shrunk significantly in the last decade after the EU pesticide review revoked approval of many broad spectrum products. In seasons of uncertain marketing or poor weather crops can be left in the soil for longer than 12 weeks creating PCN multiplication and yield/skin finish damage. Oversupply necessitates disposal of crop, often resulting in the dumping of potatoes to land or ploughing in. This produces 'volunteer' plants (potato plants growing in land outside the cropping cycle) which are often left uncontrolled, harbouring the pest allowing further multiplication.

Damage to crop has been seen after as little as 9 weeks in recent years suggesting the selection pressure of the short Jersey cropping cycle has forced PCN to shorten its lifecycle. Recent work has shown Jersey PCN to have a 95% hatch rate in 48hrs, far faster than UK PCN.

Answer (B)

The Department of the Environment Plant Health Advisory Service (Department) continues to provide best practice advice to the industry. This includes:

- Not planting crops into high category land.
- Rotation or fallow periods to allow natural decline (ideally 2 to 3 years min. between crops)
- Cleaning of machinery between fields to reduce transmission
- Strict control of volunteer plants to reduce multiplication
- Lifting of crops no later than 12 weeks
- Removal of all crop debris and disposal onto sacrificial land
- Judicious use of nematicides on higher category land as required

Some potato producers in other jurisdictions grow PCN resistant varieties but the Jersey Royal has no such resistance. Indeed, to survive in soil containing the high levels of PCN present in Jersey, the Jersey Royal has developed a PCN tolerance, meaning the potato can support disproportionate numbers of PCN.

Department research has reviewed various methods and products that have come to the market over recent years and established that the valid contributors to control are:

- Organic fertilisers (Vraic, manure, green cover crops) - improves soil ecology, particularly fungi, which will contribute to PCN suppression.
- Strict volunteer control – (control of unwanted potato plants out of season) reduces PCN multiplication and levels.
- *Solanum sysimbriifolium* (Spiky Tomato/Litchi Tomato) - 4 years Department research into husbandry. Its roots trigger PCN hatch - females cannot feed, - cannot multiply and significant population reductions can be achieved – very elegant technique with wide take up.

- Natural decline through rotation - 20 plots artificially elevated to Cat 4, after 3 years of no potato growth 19 plots had fallen to Cat 2 and one remained at Cat 3. Demonstrating that a 3 year rotation would add significantly to PCN control in Jersey.

It is planned that the following activities will be included in the 2016 Rural Economy Strategy.

- Continue to provide an advisory and research capability to ensure Jersey growers are kept informed of developments. E.g. – current work on garlic product that utilises natural polysulphides – trials this year expected in market next.
- Research genetic aspects of Jersey PCN – lifecycle and ‘vigour’.
- Engineering fixes – harvester mounted unit to destroy unwanted tubers to reduce volunteers this season.
- Alternative high value crops to allow greater rotation
- Explore existing legislation to restrict cropping in high category land and extension of season
- Investigate genetically modified organism (GMO), engineering PCN resistance into the Jersey Royal potato

Summary

- Land is tested and classified into 4 PCN categories based on pest level, 1 being relatively free of the pest elevating to 4 being unsuitable for planting of potatoes due to yield and skin finish damage incurred.
- Jersey’s intensive potato system is gradually, but in the last decade more rapidly, pushing land into the higher categories.
- Relative to other jurisdictions Jersey has high levels of PCN as a result of decades of continual potato production with insufficient land to rotate crops.
- The Environment department continues to provide a sampling, analysis and advisory service as well as research into new techniques and methods aimed at reducing the impact of this pest.