**Mapping infestations of potato cyst nematodes and the potential for spatially varying application of nematicides**

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## Abstract

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The most important constraint to potato production in the UK is the damage caused by the potato cyst nematodes (PCN) *Globodera pallida* and *G. rostochiensis*. These are serious pests, capable of causing substantial yield loss. Modern management systems depend heavily on nematicides which, at *c*. £360 ha-1 for granular and *c*. £550 ha-1 for…

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SI units only

**Keywords:** maps, nematicides, nematode control, potato cyst nematodes.

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Paragraphs justified left and right

### Introduction

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The potato cyst nematodes (PCN) *Globodera pallida* and *G. rostochiensis* are the most problematic pests faced by potato growers in Britain, being both persistent and capable of causing substantial loss of yield (Trudgill, 1986). A recent survey of potato production in England and Wales revealed that 64% of the fields surveyed were infested with PCN and that, of the infested fields, 67% were essentially pure *G.*

The Global Positioning System (GPS) has made it possible for modulated treatments with nematicides to be accurately targeted (Haydock & Evans, 1995), and commercial packages have followed (e.g. Anon., 1997).

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### Materials and methods

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The field surveyed, covering *c*. 8 ha, at Ram Farm, Nocton, Lincolnshire, grew spring barley in 1996. On 1 May, 1996, the field was sampled at 20-m intervals along the tramlines, which were 24 m apart and ran parallel to the western boundary of the field.

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Instrumentation

A DGPS receiver was mounted…

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###### Results

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The data for the pre- and post-cropping Ram Farm samples are summarised in Table 2. After harvesting, the average density of the PCN population over the whole field was found to have increased more than eight-fold, from 8 to 66 eggs g-1 soil, and the…

Table 1. Inputs for potato production and their potential for spatial application. Costs are taken from ABC (1999).

|  |  |  |  |
| --- | --- | --- | --- |
| Input | Potentially variable? | Cost  (£ ha-1) | Potential saving(£ ha-1) |
|  |  |  |  |
| N, P, K fertiliser | Yes | 220 | 33 (15%) |
| Lime | Yes | 30 | 6 (20%) |
| Herbicides (i) pre-emergence | No | 60 | - |
| (ii) post-emergence | Yes | 60 | 60 (100%) |
| Fungicides | No | 144 | - |
| Insecticides | Yes | 26 | 26 (100%) |
| Nematicides (i) Granular | Yes | 360 | 360 (100%) |
| (ii) Fumigant | Yes | 550 | 550 (100%) |

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Figure 1. Relationship between initial population density (*P*i) and multiplication rate (*P*f/*P*i) from hectare blocks at Ram Farm.



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###### Discussion

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###### Although PCN, in common with other species of plant parasitic nematodes, are fairly immobile and are spread mainly by operations that move the soil, apparently discrete patches that are surrounded by uninfested areas are often actually surrounded by areas…

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Eggs g-1 soil

[scale bar or x-y distance scales]

Figure 2. Pre-crop (left) and post-harvest (right) distributions of PCN at Ram Farm.

###### Conclusions

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Full spatial application of both nematicides would be possible if growers were to accept the possibilities of PCN patches being missed by the sampling procedure and of areas of zero count simply being below detection threshold and likely to increase dramatically if not treated.

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###### Acknowledgements

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