AHDB HORTICULTURE

Grower Summary

FV 428

Vining peas: The effect of soil phosphate levels on rhizobial population

Annual *2016*

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Further information

If you would like a copy of the full report, please email the AHDB Horticulture office (hort.info.@ahdb.org.uk), quoting your AHDB Horticulture number, alternatively contact AHDB Horticulture at the address below.

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AHDB Horticulture is a Division of the Agriculture and Horticulture Development Board.

Project title:	Vining peas: The effect of soil phosphate levels on rhizobial populations
Project number:	FV 428
Project leader:	Dr Lea Wiesel, PGRO
Report:	Final report January 2016
Previous report:	Annual report January 2015
Key staff:	Dr Lea Wiesel (PGRO) Keith Poulson (PGRO) Rebecca Ward (PGRO) Stephen Francis (Fen Peas Ltd)
Location of project:	Processors and Growers Research Organisation, Great North Road, Thornhaugh, Peterborough, PE8 6HJ
Industry Representative:	Stephen Francis, Fen Peas Ltd, The Old Farm House, Church End, Old Leake, Boston, PE22 9HR
Date project commenced:	03/02/2014
Date project completed (or expected completion date):	31/10/2016

GROWER SUMMARY

Headline

The application of starter fertilisers containing phosphorus to peas at drilling showed potential to increase yields. Any effects of fertiliser applications on rhizobial populations in soils remain to be investigated.

Background

Pea yields have reached a plateau in many areas over recent years and one option to boost yields is the application of starter fertilisers. Starter fertilisers contain phosphorus which is important for root development and nitrogen fixation by rhizobia. Nitrogen fixation not only delivers nitrogen to the pea crop but also increases soil nitrogen for subsequent crops. Some starter fertilisers, however, contain nitrogen which can be damaging to rhizobia populations with negative impacts on the pea crop and soil nitrogen contents. Thus, it is important to maintain soil conditions that sustain healthy rhizobia populations in soil. The project therefore investigates whether application of starter fertilisers increases pea yield and whether applications of starter fertilisers have an effect on rhizobia populations in soil.

Summary

Starter fertilisers with and without nitrogen have been applied to three different pea crops. In early drilled crops, yield was not affected but in mid and late drilled crops the applications of both Primary P (with nitrogen) and Microstar (without nitrogen) lead to higher yields. Strongest increases of nearly 4 t/ha have been achieved in mid drilled crops by the application of Microstar at 10 kg/ha. Results are observations only and due to the lack of replication statistical analysis could not be performed. So far, it cannot be concluded that the application of starter fertilisers impacts on rhizobia populations. This is due to the lack of a reliable method to assess population sizes. A pot test to assess rhizobia populations has now successfully been developed and tested on a small subset of samples. In mid drilled crops, rhizobial population sizes in plots that had received Primary P or Microstar at 12.5 kg/ha did not differ from untreated plots. Sample numbers are too small to draw final conclusions and all soil samples taken in both field seasons will be tested.

Financial Benefits

Yield improvements due to fertiliser application varied strongly with field site and have been obtained in un-replicated trials but results indicate a positive effect on yield by starter

fertilisers at mid and late drilled sites. Application of starter fertilisers costs approximately £25/ha. On average, the price per tonne of peas is £345. An increase of pea yield of just 73 kg/ha will result in breaking even and any yield increase of greater than 73 kg/ha will result in an economic benefit for pea growers. Results on environmental impacts are inconclusive so far and rely on assessment of the remaining soil samples.

Action Points

Action points have yet to be identified.