



Agriculture & Horticulture
DEVELOPMENT BOARD



Grower Summary

FV 380

Identification of critical soil P in
vining pea crops.

Annual 2012

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Before using all pesticides check the approval status and conditions of use.

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Further information

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

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HDC is a division of the Agriculture and Horticulture Development Board.

Project Number: FV 380

Project Title: Identification of critical soil P in vining pea crops.

Project Leader: Nathan Morris, NIAB

Contractor: NIAB TAG

Industry Representative: Richard Fitzpatrick, Holbeach Marsh Cooperative

Report: Annual 2012

Publication Date: 22nd November 2012

Previous report/(s): Annual 2011

Start Date: 01 July 2010

End Date: 31 December 2014

Project Cost: £116,862

Headline

- This project aims to identify the levels of phosphate required in vining pea production to help growers maximise yield and quality.

Background

The recent increasing costs of phosphate (P) fertiliser and concerns from the risk of diffuse pollution have re-opened the debate on the need to apply P, and whether or not a target P Index of 2 (Olsen P 16-25 mg/l) is appropriate for all soil types and crop conditions. It is intended that on completion, the project will deliver improved guidance to growers on target soil P indices suitable, in terms of plant nutrition, for both yield and quality for vining pea crops on a range of soil types, and new information on how soil type influences crop response to fresh P fertiliser.

Many growers are questioning whether or not a target soil Phosphate (P) Index of 2 (Olsen P range of 16-25 mg/l) is appropriate for all soil types and crop conditions. This target Index, based on critical soil P levels to achieve 95% of maximum crop yield, was established to achieve economic yields for all crops grown in any rotation and was based on the results of a limited number of field experiments.

Critical P values can vary between soils, depending upon soil physical conditions (e.g. soil structure, moisture, bulk density, stone content and soil porosity) and between crops, depending on root growth and architecture and P uptake rate needed to achieve maximum yield. To date, however, sufficient data for making a scientifically robust change to the recommendations have not been available.

Guidance to growers following results from this project should allow the use of P fertiliser to improve the economic efficiency in vining pea production. Specific targeted doses of P fertiliser should reduce the risk of undesirable P losses to water courses resulting in eutrophication and potentially help to meet future requirements of the Water Framework Directive

Summary of the project and main conclusions

This project is aiming to identify the levels of phosphate required in vining pea production to help growers maximise yield and quality.

Preliminary results from 2012 (Year 1 only) show that:

- The critical Olsen P varied from site to site in experiments, probably due to variations in soil physical conditions.
- Crop vigour was notably reduced at or below an Index 1 (<15 mg/kg)
- Crop maturity was appreciably affected by soil Olsen P. At Brocklesby, TR readings were measured at TR 129 where soil Olsen P was at or below Index 1 (15 mg/kg) *c.f.* a TR 116 at an Index 2 (16-25 mg/kg); and a TR 112 at an Index 3 (26-45 mg/kg).
- Results showed some clear yield responses to soil Olsen P levels;
- For Docking and Brocklesby vining pea yields were reduced by 0.3 t/ha or more and were generally more variable at measured Olsen P below the lower half of Index 2 (16-20 mg/kg).

Further results detailing critical phosphate levels in vining peas will be available in autumn 2013 after Year 2 (2011-13) is completed.

Results from Year 1 suggest some clear effects on crop maturity and yield responses to soil Olsen P levels. However, it is too early in the project to draw firm conclusions and to develop guidelines for the grower; further information will be reported at a later stage in the project.

Financial benefits

Current field experiments are on-going; possible financial benefits from the project will be detailed in the final report.

Action points

None at present.