New Project Summary Report for PO 005a: Column stocks - minimse growth and flower uniformity problems

Project Number	31600051
Title	To investigate the commercial scale use of various soil amendments to improve the quality and disease control in glasshouse grown crops of stocks, following on from the results of PO 005
Short Title	PO 005a
Lead Contractor	L&RM Consultancy Ltd
Other Contractors	-
Start & End Dates	31 March 2013 - 31 December 2013
Industry Representative	Mr Philip Collison, J A Collison & Son
Project Budget	£5,000
AHDB Contribution	£5,000

The Problem

HDC trial PO 005 looked at a wide range of treatments for the control of Fusarium oxysporum and pythium in column stock both on grower's holdings and in a pot trial at STC. Disappointingly, none of the chemical or biological treatments showed any noticeable improvement in the control of the disease or improvement in the growth or vigour of the plants in either of the trials. However, where soil amendments had been added (with the initial aim of improving the establishments of Trichoderma), some of these treatments showing a noticeable improvement in both the control of Fusarium and the overall vigour and percentage cut of the crop.

The two soil amendments that showed the most benefit were spent mushroom compost and composted bark. This occurred with treatments that were treated with Trichoderma or those that only had the soil amendment hence indicating that it was the soil amendment not the biological agent that was producing the effect. However, whilst on one nursery the mushroom compost showed a huge improvement in crop vigour, weight of stem and earliness of the crop, on the other nursery (i.e. the Fusarium trial) it resulted in the death of about half of the crop within a couple of weeks of planting. This was despite the compost being from the same sources and the change in pH and conductivity being similar in both soils. However,

the plants that did survive showed a greater resistance to Fusarium attack and improved vigour than any of the chemical or biological treatments.

The bark treatment was a late addition to the trial and was only included in the Fusarium trial. However, both it and the mushroom compost were included in an unsteamed and steamed area of the glasshouse which housed the Fusarium trial. In both situations it made a significant impact on the crop and in the unsteamed area it was one of the few treatments to produce any marketable stems at all. The impact was just as remarkable in the steamed area were it not only reduced the impact of Fusarium but also greatly reduced the number of short or weak stems that did not make the spec. This resulted in being able to harvest about 98% of stems compared to less than 50% in untreated adjacent plots.

However, while proving that bark was hugely beneficial in this situation, the trial did raise a number of other questions such as will it produce the same benefit in other soil types and situations, will the benefit last for more than one round of crop, should it be applied before or after steaming, can the rate be modified etc? In addition to these issues the trial and subsequent discussions have also raised questions about the safety of using spent mushroom compost, the herbicide contamination risk of "green composts" and if it is worth the expense of incorporating beneficial microorganisms such as trichoderma into the soil. But is appreciated that a trial to find the answers to all of these questions would be very expensive and probably be beyond the scope of what the HDC could fund.

However, the Project Manager has been encouraging growers to undertake their own trials and it is known that some nurseries will be experimenting with bark, mushroom compost and trichoderma on a large scale in 2013. In order to ensure that growers obtain the maximum benefit from the extensive 2012 trial and that as wider understanding of the issues as possible is passed onto levy payers, growers who have been actively involved in the work have requested that their own trials in 2013 (designed to follow up on PO 005 outcomes) be formally co-ordinated, analysed and interpreted which will provide the group with a sound comparison between their own separate activities and will also make the outcomes accessible to other levy payers.

Aims and Objectives

(i) Project aim(s):

To co-ordinate the ongoing "grower trials" using soil amendments used in PO 005 (2102) to improve the quality of column stock crops; collate, interpret and analyse the results and disseminate the findings to the wider industry.

(ii) Project objective(s):

1. To determine if the encouraging results obtained from the use of bark and other soil additives (HDC trial PO 005) can be demonstrated on a commercial scale and on different soil types.
2. To investigate different rates of soil amendment incorporation and its application both post and pre steaming.
3. To investigate if the use of bark (at a standard and higher rate) can reduce the frequency of steam sterilisation.
4. To investigate N additions associated with bark amendments on crop production.
5. To communicate results (and recommendations for further work, if any) to HDC members.

Approach

Regular visits to growers holdings will be made (including some not undertaking the trials in order to determine a baseline for ongoing issues in the industry) to both help with and record the trial design, obtain appropriate background information including soil type, sterilisation, previous cultivations, nutrient status and varieties. Subsequent visits will provide ongoing monitoring of the crop and a final assessment of the number of marketable stems from the trial areas (within the confines of the growers own recording systems that is) and any other relevant observations. In most cases yield recording will involve recording the number of unmarketable stems that have not been harvested and then working backwards to determine the marketable stems.

The individual issues / variables that this project aims to address are as follows:-

1. Will the addition of bark be effective on a wider range of soils and glasshouse types than the 2012 trial site?
2. 2. Is there an interaction between bark and green waste?
3. Is the bark application still effective if it is applied pre steaming?
4. Are other bark sources as affective as the source used in the 2012 trials?
5. On soils with a low disease pressure (ie no history of Fusarium) can the use of bark or mushroom compost reduce the need for steaming?
6. Can bark be used at a lower rate (or not at all) before planting a second round of stocks?
7. Is the additional N having an effect on growth if no bark is applied?