



Agriculture & Horticulture  
DEVELOPMENT BOARD



# **Grower Summary**

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## **SF 108**

Improving Strawberry Plant  
Establishment In Used Beds

Final 2011

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

Read the label before use: use pesticides safely.

## **Further information**

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

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## **Headline**

Four treatments (1-Osmocote, 2-Plantmate Granules, 7-Omex Bio and 9-Feed Solution) applied at planting improved early canopy development in one of two everbearer strawberry varieties in 2010 but did not result in yield benefits.

## **Background and expected deliverables**

Most of the UK strawberry crop is still produced in plastic-covered raised beds in field soils. The soil is commonly fumigated and there is a strong desire to prolong the value of this investment into a second crop by replanting the beds. This saves costs and reduces the use of soil fumigants.

Good plant establishment has a significant effect on yield. Strawberry growers are increasingly considering whether to continue to produce in field soil or switch to substrate systems. Replanting of beds has become more problematic as a farm's soil is repeatedly used for strawberries.

Specific objectives of this project are:

- To identify non-pesticide products that improve plant establishment of replanted everbearer crops into previously cropped soil.
- To compare the performance of these products with standard agronomic treatments.
- To quantify the establishment treatments on initial canopy development and on yield in July, August and September.
- To ascertain the financial worthiness of the treatments applied.

## **Summary of the project and main conclusions**

Products evaluated in the first year of the project in 2009 included Bio-Fungus Granules, Broadleaf P4, Broadleaf root dip, Humaroot SP, Omex Bio 18, Omex DP98, Plantmate Drench, Scotts Miracle Gro, side forking, Standard feed solution 1:1:1 and Vaminoc S.

Bare root everbearer varieties were chosen to provide the most challenging plant material for establishment in 2009.

In 2010, twelve products (Osmocote Exact Standard 5-6 month 15:9:12, Plantmate Granules, Broadleaf P4, Agralan Revive, Omex DP98, Huma-Root SP, Omex Bio 18, Side forking, Standard feed solution 1:1:1, Plantmate Drench, Vaminoc S, Radifarm) were selected following the results in 2009. Full details of all products applied in 2009 and 2010 are listed in Tables 1 and 2 (below).

They were applied to potted strawberry varieties Eve's Delight and Evie 2, planted into once-used beds in Derbyshire in March 2010. Potted plants were used in 2010, to improve uniformity of plant stock. Slightly heavier soil was also used in 2010 than had been used the previous year.

**Table 1:** Details of product application rates for 2010 and 2009

<b>Treatment Number</b>	<b>Name</b>	<b>2010 application rates</b>	<b>2009 application rates</b>
1	Osmocote Exact Standard 5-6 month 15:9:12	3 g in planting hole per plant	Miracle Gro 18:9:10, 3 g granules in planting hole per plant
2	Plantmate Granules	1 g in planting hole per plant	Not used
3	Broadleaf P4	1 g in planting hole per plant	1 g in planting hole per plant
4	Agralan Revive	10 ml per litre, 250 ml drench per plant	Not used
5	Omex DP98	4 ml per litre of water, 250 ml drench per plant	2 ml per litre of water, 250 ml per plant
6	Huma-Root SP	0.4 g per litre, 250 ml drench per plant	0.1g per litre of water, 250 ml drench per plant
7	Omex Bio 18	6 ml per litre of water, 250 ml drench per plant	2 ml per litre of water, 250 ml per plant
8	Side forking	One four pronged fork per planting hole	One four pronged fork per hole
9	Standard feed solution 1:1:1	6 ml per litre of water, 250 ml drench per plant	3 ml per litre of water, 250 ml drench per plant
10	Plantmate Drench	1.16 g per litre, 250 ml drench per plant	Pre planting root dip at 10 g per litre of water for 10-15 minutes
11	Vaminoc S	8 g granules in planting hole per plant	2 g granules in planting hole per plant
12	Radifarm	2.5 ml /litre, 250 ml drench per plant	Not used
13	Control	No treatment	No treatment

**Table 2:** Details of product claims

Treatment Number	Name (Distributor/Manufacturer)	Properties and product claims
1	Osmocote Exact Standard 5-6 month 15:9:12 (Scotts)	Controlled release fertilisers slowly release fertiliser through a polymer coated granule. They are widely and successfully used for container ornamental production, where nutrition is placed in the compost for the life of the crop and only water is applied thereafter. Scotts have been developing their use for soil grown crops. They may reduce the amount of soil leached nutrients.
2	Plantmate Granules (FAST)	A granular formulation containing proprietary strains of <i>Trichoderma harzianum</i> . It claims a protective quality against pathogens e.g. <i>Pythium</i> , <i>Rhizoctonia</i> and <i>Phytophthora</i> . Also a claim to stimulate auxins for better growth.
3	Broadleaf P4 (Agriculture Polymers International)	Broadleaf P4 is a granular polymer formulation that absorbs and stores hundreds of times its own weight of water. This property claims to reduce losses to moisture stress and improves establishment and growth. Dissolved nutrients are also absorbed, though available to the crop, and may reduce leaching.
4	Agralan Revive (Agralan)	A liquid culture of the bacterium <i>Bacillus subtilis</i> , which helps create soil conditions for healthy plant growth. Used for seedlings, cuttings and other plant material as a soil drench, a root dip, post planting treatment or compost additive.
5	Omex DP98 (Omex)	A phosphite source of phosphorous that is normally applied as a foliar spray and sometimes as a drench at planting. As a foliar application, it is claimed to improve rooting and promote plant health.
6	Huma-Root SP (Plant Solutions)	A humic and fulvic acid powder that is applied as a drench. Their high cation exchange capacity is claimed to enhance nutrient uptake, improved root growth and reduced transplant stress.
7	Omex Bio 18 (Omex)	A liquid formulation of kelp, major and minor elements. It can be applied as a drench or foliar spray. The contained 'bio stimulants' and nutrients are claimed to produce improvements in root growth and nutrient uptake.
8	Side forking	Poor soil structure is a major cause of failed plant establishment. Side forking a used bed can loosen the soil and may improve root development. A four pronged fork was inserted to 30 cm depth to the side of the replanting hole immediately after planting, then gently firmed back to ensure good root contact.
9	Standard feed solution 1:1:1	A basic feed of N:P:K. Vegetable transplant work in the eighties showed a yield benefit from nutrient solution drenching at planting. The application of a feed strength solution using straight feeds, coupled with the consolidating process of a drench may improve establishment in strawberry beds.

**Table 2 continued:** Detail of product claims

10	Plantmate Drench (FAST)	A wettable powder formulation containing proprietary strains of <i>Trichoderma harzianum</i> . It claims a protective quality against pathogens e.g. <i>Pythium</i> , <i>Rhizoctonia</i> and <i>Phytophthora</i> . It also claims to stimulate auxins for better growth.
11	Vaminoc S (Fargro)	A non-soluble granular formulation containing arbuscular mycorrhizal fungi, which have been specially selected for strawberries. Fungal hyphae extend from the inoculated roots improving the absorptive surface area of root systems. This process claims more rapid crop establishment, disease protection and increased yields.
12	Radifarm (Hutchinsons)	A liquid formulation of enzymatically produced extract from plant material with added natural components, which help stimulate the formation of new roots, and the extension of the existing season.
13	Control	No treatment applied

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The key findings were as follows:

- No treatments significantly improved the yield for any variety or transplant type used in 2009 and 2010.
- In 2010, four treatments (1-Osmocote, 2-Plantmate Granules, 7-Omex Bio and 9-Feed Solution) significantly improved canopy development in Eve's Delight, although the improvements did not last for the whole growing season. The same treatments did not enhance canopy development in Evie 2.
- The lack of significant growth improvements following treatment applications to different varieties and transplant materials make it hard to recommend these root treatments for conventionally grown everbearer strawberries planted in a healthy well managed soil. It is possible that treatment differences might have been more marked under more adverse soil conditions or had sequential applications been used.

## Financial benefits

No treatment showed a lasting significant improvement of growth or yield over the control in 2010. This is despite increasing the application rates of the more promising treatments from the 2009 trial. There are no financial benefits demonstrated in this trial.

## **Action points for growers**

Growers suffering from poor crop performance on replanted beds cannot look to root treatments applied in the manner of this trial to provide a significant improvement. Given these results, the options are:

- Evaluate efficacy of past fumigant use and areas for improvement
- Acquire fresh ground
- Examine the costs/benefits of a move to soilless substrates