The Benefits of Cross-Sector Research©

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INTRODUCTION

The Horticulture Development Company (HDC) is a levy funded body that serves the commercial horticultural industry in England, Scotland, and Wales. The levy is based on sales value and is currently set at 0.5%. It is collected to fund "near market" — that is, applied — research, development, and technology transfer and encompasses more than 300 different crops.

The research projects are set by the members of eight grower panels which cover field vegetables, soft fruit, tree fruit, mushrooms, protected edible crops, protected ornamentals, bulbs and outdoor flowers, and hardy nursery stock. "Cross-sector" projects are also funded to give members access to research that can be used on a wide range of crops in topic areas such as biological control; lighting; developments in crop hygiene; pest and disease identification, forecasting, and the use of appropriate controls; translation of European research; alternatives to revoked pesticides and the use of novel pesticide active ingredients; biopesticides; photoselective plastics; winter protection; and peat alternatives.

Traditionally each sector has tended to carry out work on its own crops, which means that work on problems common to more than one sector is sometimes duplicated or that growers in other sectors do not always realise there has been a project that could be of real value to them. For example, research into the cultural, biological, and chemical controls of pests and diseases — particularly in field vegetables, soft fruit, tree fruit, mushrooms and protected crops — has been significant and could provide hardy nursery stock (HNS) growers with valuable information.

Publicly funded horticultural R&D currently only targets edible crops which means in the ornamentals sectors the only R&D under way is that which growers themselves fund, and the bulk of that is work undertaken by HDC. So, in the current financial climate any opportunity for HNS growers to reduce their research costs of by "sharing" work with other sectors would, in effect, increase the value of the HNS research budget.

This paper provides a brief review of recent HDC work in other sectors that are of significance to HNS growers. Through this, the author hopes to encourage growers to look more widely at the research work carried out across the horticultural industry, and think about how it could be adapted to nursery stock crops. Project reports for all of the work mentioned below is available to levy-payers and voluntary members in any sector, via the HDC website <www.hdc.org.uk>.

RESEARCH IN OTHER SECTORS

Field Vegetables. Work on diseases has included crown-rot, damping-off, downy mildew, chocolate spot, club-root, stemphylium leaf spot, xanthomonas bacterial infections, ring spot, white blister, sclerotinia, fusarium, septoria leaf spot, botrytis, scab, pythium, canker, and rusts.

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Pest control has been developed for free-living and stem nematodes, leaf miner, aphid, cutworm, thrips, cabbage root fly, slugs, flea beetles, caterpillars, two-spotted spider mite, midges, wood pigeons, and rabbits.

Soft Fruit. Nursery stock growers can gain advantages from research on diseases such as botrytis, *Phytophthora* spp., crown rot, powdery mildew, *Xanthomonas*, black spot, and *Colletotrichum*.

Pest control work has included vine weevil, aphids, midge, capsid, tarsonemid mite, and two-spotted spider mite.

Tree Fruit. Particular tree fruit diseases that can also affect nursery stock and have been investigated by this sector include scab, fireblight, canker, botrytis, and powdery mildew.

Focus on pests such as codling moth, sawfly, mussel scale, light brown apple moth, aphid, leafhopper, and midge has also helped nursery stock growers to selecting the most appropriate controls.

Mushrooms. Of particular concern to this sector are verticillium diseases as well as sciarid and shore flies, which also affect a range of ornamental crops.

Protected Edible and Ornamental Crops. Diseases such as botrytis, bacteria, white rust, tomato spotted wilt virus, pansy mottle syndrome, fusarium, verticillium wilt, rhizoctonia, sclerotinia, downy mildew, thielaviopsis, *Phytophthora* spp., and *Colletotrichum* have been the focus here.

Recent work on pests that are notifiable in the U.K. such as *Tuta absoluta* (South American tomato moth, a leaf miner) and *Bemesia tabaci* (tobacco whitefly), as well as leafhopper, aphid, two-spotted spider mite, capsid, Western flower thrips (WFT), sciarid and shore flies, lily beetle, mealybug, whitefly, and caterpillars has produced useful information for the nursery stock sector.

Cross Sector Projects. Examples of some of the research relevant to all sectors is listed below:

- A website to provide current information on pesticide approvals for ornamental crops.
- Thermal and visual analysis for crop scanning and disease monitoring.
- Ground sink refrigeration.
- Development of a pre-selection system for seasonal horticultural labour.
- Champion supervisor model and training programme to improve selection and training of key staff.
- The use of "sterile insect technique" to increase the success of IPM in horticultural crops.
- The implications of "carbon foot-printing" for U.K. horticulture.
- Commercial production of rosemary to provide the raw ingredients for developing a new genre of bio-based antioxidants for industry.
- A review of peat alternatives for U.K. commercial plant production.

- The use of potassium bicarbonate for powdery mildew control.
- The effect of spectral modified tunnel cladding materials on invertebrate pest populations.
- The technical and economic benefits of spectral modified plastic crop covers for horticultural crops.
- Sex pheromone ecology of some important U.K. midge pests.
- The application of trap plants for pest control in field vegetables.
- The activity patterns of WFT and their manipulation to enhance control measures.