



Agriculture & Horticulture  
DEVELOPMENT BOARD



# New Project

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## FV 402

Brassicas: Pre-adaptation of seedlings for increased resistance to pest and pathogen attack

**Project Number:** FV 402

**Project Title:** Brassicas: Pre-adaption of seedlings for increased resistance to pest and pathogen attack

**Project Leader:** Angela Huckle

**Contractor:** ADAS UK Ltd

**Industry Representative:** David Clay  
Staples Vegetables Ltd

**Start Date:** 1<sup>st</sup> April 2012

**End Date:** 31<sup>st</sup> March 2013

**Project Cost:** £29,050.00

*SUBJECT TO CONTRACT*

**Project Summary:**

Brassica plants are susceptible to attack by downy mildew and cabbage root fly. Both pests affect growth and may result in a non-uniform crop, unmarketable produce and plant death. Pesticide treatments are commonly applied during plug plant production or soon after transplanting to control these pests. There is experimental evidence in some crop species that plants which have suffered temporary environmental stress are more resistant to pest attack. Grower observations also suggest that plants which are subjected to controlled period of stress are more resistant to pest attack compared with those grown 'soft'. The aim of this project is to explore the potential of using a controlled short duration salt-stress during production of Brassica plug plants for increasing natural host resistance to early attack by downy mildew and cabbage root fly. This approach will be tested across a single growing season in two ways: i) salt stress will be applied as a pre-adaptive treatment in the week prior to dispatch, the timescales of which will concur with commercial practice; the treated plants will be challenged with pests post treatment while still under glass, and ii) batches of module raised plants under glass will be pre-adapted with salinity stress and the performance and resistance to pest attack will be assessed from the point of transplant at two diverse field sites to monitor the effectiveness of the treatments through to crop maturity.

## **Aims & Objectives:**

- (i) Project aim: To reduce the use of pesticides on Brassicas by increasing the host resistance of young plants.
- (ii) Project objectives:
- To summarise current approaches to cabbage root fly (*Delia radicum*) and downy mildew (*Hyaloperonospora parasitica*) control;
  - To explore the physiological and growth response of untreated and pre-adapted plants to pest challenge;
  - To quantify the pest resistance of pre-adapted seedlings to selected inoculum levels of cabbage root fly and downy mildew.

## **Benefits to industry**

The commercial objective of this project is to provide vegetable growers with guidelines on plant stress manipulation for control of two common pests of Brassicas. This will allow growers to mitigate against the current level of chemical usage and reduce the costs of production and minimise the risk environmental pollution.

The potential benefits to the industry are:

- To understand and incorporate the practice of pre-adaptation treatments into plug raised Brassica that confer disease and/or pest resistance
- Increased confidence in using the natural stress response functioning of plants to improve resilience to pest attack.
- To potentially reduce the dependence of chemical use to control pest attack.
- Increased profitability by potentially decreasing the level of chemical control of widespread pathogens in Brassica plug plant production.
- To maintain productivity and minimise wastage whilst reducing chemical use.

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