Introduction
The ascomycete fungus *Sclerotinia sclerotiorum* is a necrotrophic pathogen with a host range of over 400 plant species including economically important crops such as lettuce, vegetable brassicas, oilseed rape, beans, peas, potatoes and carrots. UK carrot growers suffer estimated annual crop losses in excess of six million pounds due to the disease, with marketable yield estimated to be reduced by 1 tonne per hectare for each 1% increase in diseased roots. The pathogen survives in the soil as sclerotia (resting bodies which can survive for at least 5 years) which germinate when brought close to the soil surface to produce mushroom-like apothecia. These then release air-borne ascospores which infect plants and eventually further sclerotia are formed on diseased plants and are returned to the soil. *S. sclerotiorum* is a diverse pathogen with multiple genotypes being found within a single crop in the UK. A relative of *S. sclerotiorum*, *S. subarctica* has been recently identified in the UK after previously only being found in Norway on wild hosts and on vegetable crops in Alaska. The symptoms caused by *S. subarctica* are very similar to *S. sclerotiorum* and therefore may be undetected in crops in the UK. Control methods for Sclerotinia disease are predominantly fungicides and cultural practices such as foliage clipping or crop rotations. Products such as Contans WG (biocontrol agent) and Perlka (Calcium cyanamide) provide long-term control against the disease by reducing the numbers of sclerotia in the soil, but are generally considered too costly by growers.

**Aims**
To identify potential new soil treatments for control of Sclerotinia disease and to assess the impact of pathogen diversity on both aggressiveness and fungicide sensitivity.

**Objectives**
1. To determine the effect of organic soil amendments on the survival of sclerotia of *Sclerotinia sclerotiorum*.
2. To determine the aggressiveness of different *Sclerotinia* genotypes and species on commercial carrot varieties and quantify production of sclerotia.
3. To evaluate the sensitivity of different *Sclerotinia* genotypes and species to fungicides.
4. To investigate the epidemiology and control of *Sclerotinia subarctica*.
5. To carry out a population study of *S. sclerotiorum* on *Daucus carota* in the UK.

**Sclerotinia sclerotiorum Life Cycle**

**Biofumigation**
Using *Brassica* green manure crops for biofumigation can provide control against Sclerotinia disease, but has not yet been shown to have a consistent significant effect on viability of sclerotia. Many *Brassica* species produce significant levels of glucosinolates, which are hydrolysed in the presence of water and endogenous myrosinase enzyme to release isothiocyanates (ITCs) which have a wide range of biocidal characteristics.

**Biofumigation Trial – Soil Box Method**
Field rate equivalent of treatments (plant material macerated first) were mixed with pasteurised compost and this compost mixture was placed into 600ml hotform boxes with 30 pre conditioned sclerotia arranged in a grid pattern. The sclerotia were covered with more of the compost mixture, water was added and lids were immediately placed on the boxes. Boxes were incubated at 15°C and checked for germination twice a week.

4 replicates of the following treatments:
1. *Brassica juncea* ‘Vittasso’
2. *Brassica juncea* ‘Pacific Gold’
3. *Sinapis alba* ‘Brisant’
4. *Brassica juncea* ‘Caliente 99’
5. *Raphanus sativus* ‘Terranova’
6. *Eruca sativa* ‘Nemat’
7. Biofence
8. Perlka (calcium cyanamide)
9. Contans WG (Coniothyrium minitans)
10. Untreated

**Results From Initial Soil Box Trial**
Carpogenic germination has been affected by the biofumigant crops, with white mustard treatment (*Sinapis alba* ‘Brisant’) showing the greatest reduction in germination after 98 days.