Control of *Alternaria* spp. in potato

John Keer
1. Why is this a new threat?

2. Biology and life cycle of *Alternaria spp.*

3. *Alternaria spp.* trial results 2010-13

4. Constructing a cost-effective control programme
Control of *Alternaria spp.* in potatoes

*Alternaria spp.* = early blight

*Phytophthora infestans* = late blight

Simplified terminology for this presentation
Alternaria spp. – why a new threat in potatoes?

1. Climate change – warmer summers
2. Change in blight fungicide usage – Swedish experience
3. More susceptible varieties = more inoculum
4. New more virulent Alternaria strains – USA work
Life cycle of *Alternaria* spp.

**Disease develops on first fully expanded leaves near soil**

In the presence of free water conidia germinate on leaf surface. Disease penetrates leaf directly or through stomata or wounds.

**Conidia are dispersed by wind and rain splash**

Leaf lesions vary in shape and size. Often delineated by veins and may have yellow halo.

**SPRING**

Spores are produced on infected plants and plant debris between 5-30°C. Sporulation is favoured by alternating wet/dry periods.

**WINTER**

Survives winter on plant debris.

**AUTUMN**

Tubers can be inoculated during lifting and circular sunken lesions develop in store – not common in UK.

**LATE SUMMER**

Disease prevalent on senescing tissue and plants stressed by nutritional deficiencies and pest attack.
**Alternaria spp.**

- Survive in crop debris and soil
- Relatively weak pathogens – stressed crops
- In season spores are spread by wind or water and infect older or senescing leaves - *usually*
- Infection conditions: dry period (releases spores) followed by warm (c. 25°C) wet days (infection)
- Time between infection and visible symptoms: 6-8 days – shorter latent period on older leaves
Alternaria spp.

- Epidemic depends on varieties, crop growth stage, nutrient levels and weather conditions
- Nutrient deficiencies increase Alternaria risk
- Factors reducing root system e.g. PCN, compaction and drought
- Higher rates of nitrogen reduce disease levels
Alternaria alternata or solani?

**Alternaria solani**
- Occurs later in the season
- Favours senescing leaves in lower canopy
- The most aggressive of the two species
- Can be well controlled with fungicides

The only “sure-fire” way to identify the species is to look at the spores through a light microscope.
Alternaria solani

A. solani in King Edward - aggressive
Alternaria solani

A. solani in Vivaldi
Alternaria solani

A. solani in Vivaldi
Alternaria solani - textbook

Necrotic lesion often surrounded by “lemon-yellow” chlorotic halo.
Alternaria solani – Holbeach 2010

Vigorous healthy new leaf?  Senescing leaf

Richard Austin
Agriculture Ltd
Alternaria solani – tuber symptoms

Photos from Europe