Predicting Disease Spread and Containment Strategy
6 April 2011

Bruce Rothnie
Phytophthora Project Manager (England)
To predict the rate and extent of future disease spread we need to understand:

- The **climatic risk** and influence of weather patterns
- The **probability of spread over distance** from known infection sites – spore dispersal/vectors
- The **distribution** of sporulating **host plants** across the landscape
Climatic Risk

- Sporulation levels will relate to weather conditions, especially temperature and rainfall.
- Potentially large variations in spore levels between years.
- Current understanding is for an autumn peak for sporulation from larch.
- Rhododendron sporulates at lower levels but throughout the year.
Probabilities of Dispersal

- Localised spread from sporulating trees
- Local microclimate, topography and human activity
- Plant trade, human/animal dispersal, weather events?

Distance from Infected Trees

- 250m
- 500m
- 750m
- 1km
- 2km
- >10km
Sources of **Larch** data:

- Full mapping detail in FC woodlands
- Variable knowledge within private woodlands

Sources of **Rhododendron/Vaccinium** data:

- Limited map distribution data
- Predicted mapping using physical/climatic characteristics
Risk – No Control

Prob. Infection - 10yrs
No Control

Prob. Infection - 20yrs
No Control
Containment Strategy

April 2010

September 2010
Levels of Clearance

Clear 100m buffer

Symptomatic tree with 100m buffer

Area 3.14ha

Consider clearance in some areas out to 250m

Level of clearance requires assessment of proximity to other potential host plants; topography/water, extent of existing infection
Spread Risk Zone

Symptomatic tree with 100m buffer

- Symptomatic tree
- Non symptomatic tree
Risk – Reactive Control

Prob. Infection - 20yrs
No Control

Legend
AvgProbability_50000 Value
High: 1
Low: 0

Prob. Infection - 20 yrs
Reactive (stand removal)

Legend
AvgProbability_20yr_0m Value
High: 1
Low: 0

Distance Scale:
0 25 50 100 150 Kilometers
Risk – Reactive Control

Prob. Infection - 20 yrs
No Control

Legend
AvgProbability_50000
Value
High : 1
Low : 0

Prob. Infection - 20 yrs
Proactive (250m removal)

Legend
AvgProbability_20yr_250m
Value
High : 1
Low : 0

Kilometers
Current Strategy

• Detect outbreaks as early as possible

• Undertake action to fell trees as quickly as possible, prior to peak sporulation period

• Fell all trees within 100m from symptomatic trees

• Assess need for further felling out to 250m at each site depending on spread risks

• Apply biosecurity measures and continue to monitor sites after action