

## INTRODUCTION

Late blight (*Phytophthora infestans*) infection of potatoes is a major limitation on production and profitability for potato growers. In an effort to prevent late blight from infecting crops, conventional potato growers routinely spray their crops as frequently as once a week with chemicals to prevent the disease taking hold. This has obvious implications in time of man power and chemical costs, as well as potential environmental considerations.

The ideal solution to the late blight problem would be a potato variety which is inherently resistant to the disease. CALU's potato blight demonstrations and trials have been looking at just such varieties of potatoes which are being developed by the Sárvári Research Trust.

## WHAT IS LATE BLIGHT

Late blight in potatoes is caused by the oomycete (a fungus-like organism) *Phytophthora infestans*. The latin name means "devastating plant destroyer" (*phyto* – plant; *phthora* – destroyer; *infestans* – devastating).

During warm damp conditions spores are produced on the leaves of infected plants. If the weather then becomes dry, the spores are released and can travel considerable distances on the air. If humid weather persists the infection will continue to multiply within the infected plant. Periods of highest risk are called "**Smith Periods**" and are defined as:

*"A period of two consecutive days where the minimum temperature remains above 10°C over the whole 48hr period and where relative humidity remains above 90% for at least 11hrs each day"*

When the spores land on wet foliage they "hatch" to release swimming zoospores (or "swarmers") which may encyst on the leaf, or may be washed down into the soil and infect the potato tubers.

Infected leaves show brown or black lesions, these may also appear on plant stems. Infected tubers show mottled brown lesions. A severe infestation can reduce a healthy crop of potatoes to a slimy mass within a matter of weeks.

## EXAMPLES OF TYPICAL VISUAL SYMPTOMS OF LATE BLIGHT INFECTION



**Top left:** whole plant affected by late blight

**Top right:** leaf showing lesions

**Bottom left:** tuber showing mottled brown lesions

## SÁRPO VARIETIES OF BLIGHT RESISTANT POTATOES

For more than 40 years the Sárvári family have been breeding for high blight resistance in potatoes in Hungary. The Sárvári Research Trust was established to develop and promote this work. The resulting varieties are called Sárpo (Sár from Sárvári and po from potato). There are currently two varieties of Sárpo potatoes on the UK National List, with many more still undergoing trials.

### CALU'S LATE BLIGHT RESISTANT POTATO DEMONSTRATION TRIALS

#### Objectives

The objectives of CALU's demonstration plots were:

- to examine the resistance to *Phytophthora infestans* in selected Sárpo varieties within a high risk blight area;
- to undertake variety trials including assessment of yield;
- to evaluate the cultivar Sárpo Axona under different seed rates.

#### Methods

##### **Layout of variety trials for blight resistance**

The cultivars were arranged in a fully randomised complete block design with three replicates. The plots were four rows wide (3.0 m) and 3.3 m in length.

##### **Layout of trial to assess effects of planting densities on weed suppression and yield using Axona**

The Axona plots were arranged with all plots four rows wide (3m) and 7.2 m in length.

##### **Records of weather conditions**

Full Smith Periods and Near Misses were recorded for the site from Blight Watch

##### **Photographic records and written descriptions**

Photographs were taken of each variety in the trial to show characteristics of growth and haulm habit.

##### **Records of foliage blight**

Foliage blight was assessed regularly on all three trials during the epidemic as a percentage of leaf area destroyed by blight using a modified MAFF key 2.1.1 - Potato Blight on the Haulm (Anon., 1947 & 1976 ; Large, 1952 ).

##### **Assessment of yield**

All Sárpo trial plots were harvested. Plot yields were taken using an elevator potato harvester and manually forking each plot, all tubers >35 mm were included in the yield totals except for rotted tubers. Yields were calculated as tonnes per hectare.

##### **Destruction of haulm**

The haulm was manually cut to ground level and removed from each plot on 16 September.

## CONCLUSIONS

### Foliar blight

The trials undertaken in 2005 found that Sárpo cultivars showed high foliar blight resistance with the exception of Sárpo Dawn, Sárpo Harri and Sárpo Quentin. Blight resistance in Sárpo cultivars was greater than in commercially available varieties in the trial with the exception of Sárpo Dawn. Sárpo Dawn showed no significantly higher degree of blight resistance than the highest scoring commercial cultivar, Cara.

### Tuber blight

Post-harvest tuber blight was recorded in 5 of the Sárpo varieties, but in none of the commercial varieties. The highest incidence of tuber blight was found in Sárpo Olive, followed by Sárpo Sally and Sárpo Carrie.

### Yield

There was a considerable range in yield between cultivars, with a range from 19 t/ha to 62 t/ha. With one exception (Sárpo Rob), all the Sárpo varieties had higher yields than the commercially available varieties.

