New Races of mildew in spinach

Downy mildew (*Peronospora farinose*) is probably the most widespread and destructive spinach disease worldwide. Like all downy mildews, this pathogen requires cool, wet conditions for infection and disease development.

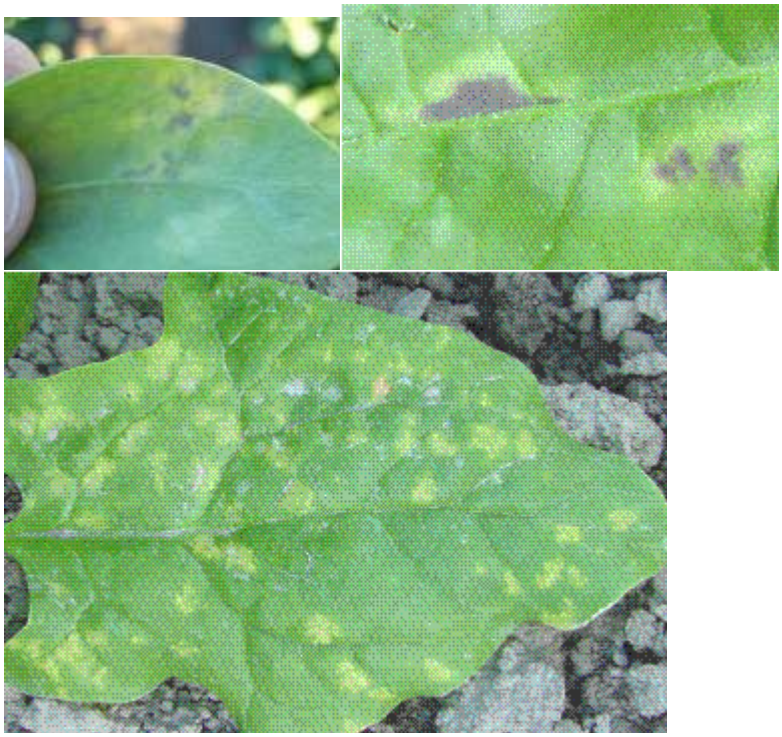

Figure 1. Downy mildew on spinach leaf
The heavy canopy of densely planted spinach retains moisture and creates ideal conditions for infection and disease development.

Figure 2. Fungal mycelium on the underside of the leaf

Spores (called sporangia) are dispersed in the air from plant to plant and field to field by wind and water splash from rain and overhead irrigation. Initial symptoms of downy mildew consist of bright yellow spots that form on cotyledons and leaves. With time, these spots can expand and become dry. Close inspection of the underside of the leaf often reveals the purple to blue grey growth of the fungus. Heavily infected leaves appear curled and distorted and may take on a blighted effect as a result of numerous infection sites. Historically downy mildew has been controlled in the spinach industry by

planting cultivars with single-gene resistance to a given race. A number of crop management practices including the use of fungicides can control downy mildew. The baby leaf industry preferred method of control is the utilization of genetic resistance.

New races found

Currently there are 10 recognised races of downy mildew in the USA and 9 races in Europe. Over the last production season in California USA the most predominate race which was isolated from spinach crops was race 10. The increase demand for spinach has resulted in back to back plantings with the resultant increase in disease pressure. Japan has also experienced an outbreak of race 5 in a market which has traditionally only needed race 1-4. Australia currently needs a minimum of race 1-7; there have however been unconfirmed reports of lines with race 1-7 experiencing outbreaks of downy mildew Pf.

The growth of the salad and baby leaf industry in Australia has resulted in an increasing need to ensure that spinach lines have both the desired leaf characteristics and have single gene resistance to the various downy mildew races (Pf 1-10).

Research underway

Currently Lefroy Valley in New Zealand and Australia are continuing, in collaboration with Pop Vriend, with extensive screening trials and large scale grower trials to identify new cultivars that have the correct leaf characteristics and single gene resistance to Pf races 1-10. Pop Vriend have been actively breeding spinach over the last 15 years and remain at the forefront of spinach breeding.

Exciting New Lines

Four new commercial lines will be available over the next season these included a new high quality paddle shaped winter line. An autumn shoulder to mild winter line and two new slow bolting summer lines all with improved leaf quality and Pf 1-10.

PV 385

Round leaf hybrid spinach for winter production. Early maturing line, slightly later in maturity to Nagano. Leaves are smooth, thick, medium dark green and with a rounded paddle shape. Highly resistant to PF 1-7. Suited to both baby leaf and processing. PV 385 is medium dark green, fast growing hybrid spinach.

PV 492

New Imola type for summer trials. Growth rate is very similar to Imola with high bolting tolerance. Improved leaf style which is darker and slightly thicker. Leaves are a light semi savoy. Leaves are very erect, for ease of mechanical harvest. PV 0492 is highly resistant to Pf 1-10.

PV 495

Medium slow maturity summer spinach hybrid. Faster growing then Imola, similar to Monza in maturity. Round, uniform sized, thick dark green leaves, with improved peduncle length and a semi blistered appearance. Leaves are very erect, for ease of mechanical harvest. Highly resistant to Pf 1-10.

FIORANO

Fiorano is a hybrid spinach variety suggested for harvest in autumn & spring where high bolting tolerance and Downy Mildew resistance is required. The upright plant and good petiole length is ideal for baby leaf production. Round, slightly savoy, very dark green and thick leaves. Highly resistant to Downy mildew Pf1- 10.