

## **Fusarium basal rot on allium**

*Fusarium oxysporum* f. sp. *cepae*

J.M. van der Wolf & A.S. Duriat

*Plant Research International, P.O. Box 16, 6700 AA Wageningen, tel. +31.317.476024, Fax +31.317.423110, E-mail [Jan.vanderWolf@wur.nl](mailto:Jan.vanderWolf@wur.nl) IVEGRI, Jl. Tangkuban Perahu 517, Lembang, Bandung 40391, Indonesia, Fax +62.22.2786245, [Duriatas@plaza.com](mailto:Duriatas@plaza.com)*

*Fusarium oxysporum* f.sp. *ceae* is the causal organism of basal rot on shallot, onion, chive and garlic. A number of synonyms are known for this pathogen. The pathogen is found worldwide

### **Symptoms and damage**

Fusarium can infect hosts at any time during their growth

On the leaves

- Leaf tips turn yellow and die back resulting in the desiccation of leaves, which usually remains upright (Fig. 1).
- Seedling emergence is delayed and infected plants can be stunted
- Heavy infections result in seedling damping
- Occasionally plants may wilt

In bulbs and roots

- Decay starts the basal plate area in growing plants and spread upwards (Fig. 2, 3)
- Basal rot of bulbs in storage
- Tissue of infected bulbs appear brownish and watery
- Roots rot off and are replaced by a mass of white moldy growth

Disease development is favored by a high soil temperature (25-28 oC)

### **Survival and dissemination**

- The pathogen is mainly transmitted by (symptomless) infected bulbs and transplants.
- Fusarium can also be transmitted via true seed
- Soil infested with chlamydospores (7.5-10 µm in diameter), adhering to plant parts can also disseminate the pathogen. Chlamydospores can persist for a long time in soil
- Disease incidence increases by insect damage
- The pathogen also produces microconidia (unicellular) and macroconidia (fusiform or ellipsoid, 3-4 septate).
- In mature plants infections remain in the basal plate area for some time before spreading to the fleshy bulb scales and causing decay
- Spread during storage is not significant

## ***Prevention and cure***

### Cultural practices

- Use certified pathogen-free plant bulbs, and disease-free transplants
- Grow in well-drained pathogen-free soil, in places where air circulation is good
- Avoid the use of overhead irrigation; drip irrigation is preferred. If used, allow crops to dry quickly
- Lower the density of transplanted crops
- Treat seed with hot water or a fungicide before planting
- Avoid working around plants when the foliage is wet
- Eradicate weeds, in particular members of the onion family that can host *Fusarium*
- Control insects, to prevent wounding
- Strive to maintain a balanced fertility.
- Eliminate allium cull piles and burn or deeply plow plant debris. Practice crop rotation (allium species only every 4 years)
- Use of resistant cultivars
- Storage of bulbs at low temperature (4 °C) decreases incidences

### Chemical control

Dipping of plantlets in a fungicide (e.g. benomyl) before transplanting reduces losses



Fig. 1. Dieback of leaves



Fig. 2. Transsection of bulbs showing basal rot in various stages



Fig. 3. Decayed bulbs