



Bulb and Cut flower Industry

The task

The bulb industry is blighted with a spring bacterium which attacks bulbs and either weakens or kills them.

It is our task to use a clean technology to control the disease and reduce the spoilage which in certain varieties can be as much as 25% of the yield.

Several approaches are needed to achieve this and the treatment will have to intervene at certain strategic stages of the bulb growing operation.

The need to create healthy bulbs for planting by the farmer as well as creating healthy bulbs for sale to the public is of paramount importance.

Since 1950 Fusarium type spring bacteria have caused heavy losses in yields. Some years worse than others.

The main problem species:

Fusarium oxysporum f.sp.narcissi

Fusarium hostae f.sp. hyacinthi

Fusarium oxysporum f.sp.gladioli

Fusarium oxysporum f.sp.lili

Fusarium oxysporum f.tulipae

A good deal is known of this spring bacterium and various bodies are tackling the problem with the backing of bulb growers and the Governments.

Fusarium oxysporum control and eradication on bulbs

Host plants include Narcissi; Hyacinthi; Gladioli; Lili and Tulipae

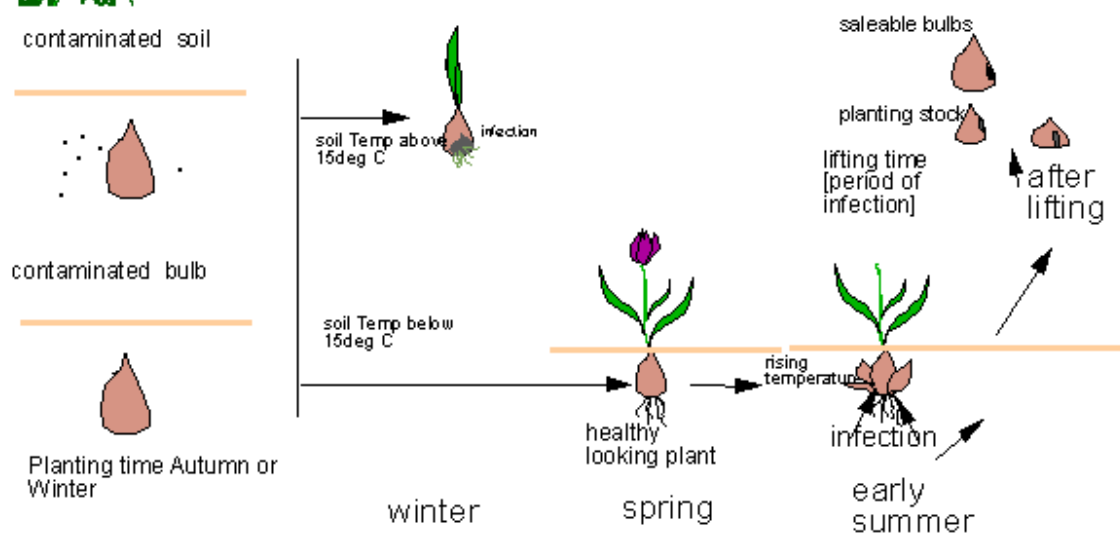
Since 1950 the problem of spore infection has got steadily worse in the main growing areas of EU.

Infection spreads by various means:

- * High soil temperature in early spring
- * Cross contamination during washing
- * Poor storage conditions – too humid – spreads from bulb to bulb especially if surface damage is present
- * Fungi is difficult to remove and kill
- * Infections can start during the harvest but mostly occur after the harvest. It is also possible for latent infections to be present which cannot be recognized
- * The causes of infection are “sick” bulbs
- * Spring mycelium on the outer layer of the bulb (picture)
- * Infected Soil – Spores can live for many years in the soil. They do need oxygen to live so deep ploughing can be effective

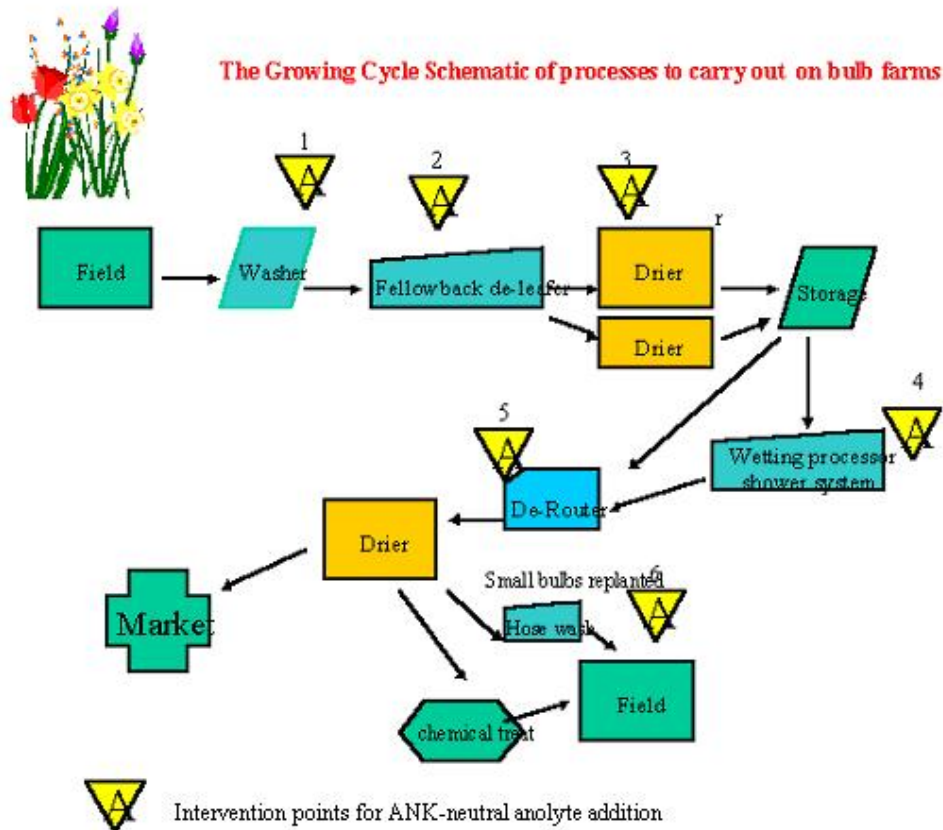


The Infection Cycle of Fusarium Oxysporum Tulipae



All in all, this is a very serious problem. Control of the disease needs to be addressed if yields are to be preserved. Envirolyte recommends an action plan which, if put in place will have a massive impact on control of the disease. It involves using a safe sporicidal liquid wash protocol with a common sense bulb handling regime at sowing and harvesting times.

Envirolyte solution



ANK-Neutral Analyte(ANK) is a totally harmless liquid made by electro chemical activation and contains hypochlorous acid, chlorine, chlorine dioxide, ozone as some of the active ingredients. It has low fume and is near neutral in pH. A hazard data sheet is available on request.

Some of Envirolyte Electrolysed Brine water conditioning generators.



These units can make up to 600 litres per hr of high grade sporicide proven to kill Fusarium spores. Larger models which make up to 2000 litres/hr can be provided.



Envirolyte generator is shown filling the IBC vessel. It can be located on site or at a central point to serve several farms.

Laboratory work indicates that a wash regime of ANK liquid made by the process of electrochemical activation of brine will remove and kill all the different species of the spore.

The tests prove that a 10 minute exposure to the liquid achieved a log 7 reduction in Fusarium spores.

This wash protocol can be incorporated into the normal wash practices of the bulb grower.

By adopting additional sensible procedures at sowing and harvest high returns are possible in terms of yield. This may include:

- ✓ Planting vulnerable plants too early
- ✓ Rotating the crop
- ✓ Removal of "dead" plants as far as is practical before starting a disinfection regime using ANK
- ✓ Control nitrogen in the soil
- ✓ Avoid rising soil temperatures by hoeing and removal of leaves around the plants
- ✓ Dry the bulbs within 24 hrs
- ✓ Store the bulbs in a dry and loose fashion
- ✓ Ensure good ventilation

ANK will break the cycle of infection. Infected land can be treated with ANK, as well rendering it safe and productive.

Envirolyte representatives or agents will give advise to individual growers on how to set up wash protocols.

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