

ISSUES RELATED TO CONTAINMENT OF RACE 4 FUSARIUM IN COTTON

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PRACTICES TO CONSIDER WITH FOV-INFESTED FIELDS

Fusarium is a soil-inhabiting fungal organism. Certain forms of this organism can survive for long periods in soil, even if the host plant (in this case, cotton) is not present. Forms of the organism can also be reproduced in and distributed in plant tissue that is infested with the organism. This organism is nearly impossible to eradicate from soil once inoculum is widely distributed, and any currently-available chemical control measures are very expensive and still not close to 100% effective. This means that primary efforts in fields where the problem is identified should be directed toward containment and avoidance of practices that can cause further spread of the organism.

Scouting fields for FOV problems:

- As far as we know, symptoms of the different races of Fusarium on cotton will look similar, so finding plants with symptoms doesn't necessarily mean that it will be race 4 Fusarium. To the degree our resources allow, we will try to follow up on evaluation of plants at field sites as long as we collect the samples, are allowed to visit the sites, and growers / land owners give verbal or written permission to sample and evaluate samples.
- Timing of sampling and scouting may be different (earlier) than what you do in looking for weed problems or Verticillium in checking seed or production fields. The race 4 type of Fusarium has been seen as affecting cotton plants as early as the 1-2 leaf stage (seen in several fields recent years) or more typically around 4 to 10 main stem nodes. After some initial die-back of plants or partial defoliation during these growth stages, it has also been typical to see some additional plants in affected areas develop additional damage and die, and other plants in affected areas to experience some partial leaf loss followed by recovery (survivor plants). The relative number of survivor plants in impacted areas is likely affected by fungal inoculum populations in the soil, the variety of cotton planted (relative resistance or tolerance) and environmental conditions (impacts of other stresses).
 - For pictures of plant symptoms, see July 2003 or September 2003 Fusarium updates on the UC cotton web site: <http://cottoninfo.ucdavis.edu>

When plants identified with foliar symptoms and/or root vascular staining, and Fusarium is confirmed, consider:

- **Plant removal**
 - Pull out or destroy affected plants and plants in immediate adjacent rows if possible:
 - If the affected area is large, consider leaving plants in place and killing them with a herbicide
 - If the affected area is relatively small, pull out or hoe out affected plants and destroy / burn them in place within the affected area
 - Make a note of the affected area so you can check again later and do additional clean-up as required
 - If the problem spread beyond original area, destroy additional affected plants if in a small enough area
- **Irrigation, personnel and equipment traffic**
 - Limit tractor, personnel and implement traffic in affected areas to greatest degree possible, particularly during times when soil is moist and more likely to stick to tractor tires, boots or implements
 - Can be as simple as knocking off excess soil & plant parts before moving around or between fields
 - Try to use rolling cultivators instead of knives (reduce practices that can drag soil through infested areas into clean soil areas)
 - Washing off soil particles stuck to equipment or boots, either with a pressure washer or with a detergent-based cleaner able to penetrate soil particles will further reduce the chances of spread of inoculum (contact UCCE for information on detergents)
 - Irrigation water can move both soil and infested plant parts across fields. If tailwater recovery systems are in use, restrict movement of tailwater off of infested fields as much as possible
- **Production of planting seed**
 - Do not produce planting seed in fields confirmed as affected by FOV (race 4 or other races), or in fields adjacent to affected fields. FOV is potentially seed-borne, so seed production in these fields is an unacceptable risk
- **Utility of Crop Rotations and Host-Plant Resistance in Cotton**
 - Although not yet evaluated specifically for race 4 FOV, rotation to non-host crops or summer fallow does reduce disease inoculum survival, particularly with multi-year rotations. However, evaluations with other races of FOV in cotton have not eradicated the problem – upon replanting of susceptible host cotton varieties, the disease would be expected to return to damaging levels in a relatively short time period
 - If you plan to plant cotton in soils known or suspected to be infested with race 4 FOV, planting a variety identified as more resistant to this pathogen would be expected to reduce further inoculum production and lessen economic damage to the planted crop.

** for additional discussion of control measures, please see CA Cotton Review articles or guidelines from 2003 & 2004 available on the University of CA cotton web site: <http://cottoninfo.ucdavis.edu>. Updates will be posted as they are available.*