

# Plant Diseases

## Black Root Rot of Tobacco

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Black root rot has been one of the most costly diseases of tobacco in Tennessee. This disease attacks tobacco either in the plant bed or in the field. It is a serious problem where tobacco is grown repeatedly in the same bed or field. Rarely does black root rot cause spectacular damage in any one field. It is important that growers be able to recognize black root rot and take the necessary control measures.

### Symptoms

Plants infected with black root rot wilt rapidly during the hottest part of the day and recover during the evening hours. This wilting and drooping of the leaves is especially noticeable on hot, sunny days, following a rainy period. Infected plants are stunted and scattered, causing an uneven growth pattern in the field. Root systems of infected plants are reduced; the roots are characteristically short, stubby, black and decayed.

### Cause

Black root rot is caused by the fungus *Thielaviopsis basicola*. Spores (seed-like bodies) of this fungus can remain in the soil for many years.

Other crops, especially legumes, also are hosts for this disease. Black root rot is most severe during cool, wet seasons that favor fungus development.

### Factors Influencing Black Root Rot

#### Soil pH

Black root rot is usually more severe in soil with a pH above 6.5. A soil pH below 6.5 is less favorable for the development of the disease. Since tobacco will produce good growth between a pH of 6.0 and 6.5, it is important to maintain soil reaction within the range of 6.1 to 6.5 for burley and 5.6 to 6.0 for dark tobacco, in black root rot-infested soils. Tobacco fields should be soil tested and limed only when the pH is below 6.1 for burley and below 5.6 for dark tobacco.

#### Organic Matter

Decomposing organic matter in the soil increases the severity of black root rot. The addition of manure to the soil and the turning under of cover crops should be far enough in advance of planting to allow sufficient decomposition of this organic matter.



## **Control**

Black root rot can be controlled by following certain production practices.

### **Use Disease-Free Plants**

An important step in controlling black root rot is to start with disease-free plants. Select a well-drained soil, free of the black root rot fungus, for the plant bed site. Methyl bromide, used to gas the bed, will kill this organism, as well as many other disease-causing organisms that may be present in the soil. Take care not to bring soil from black root rot-infested areas into the plant bed.

### **Proper Crop Rotation**

In fields where black root rot is a problem, other susceptible crops should not be used in rotation with tobacco. Legume crops should be avoided. Crops suggested for rotation with tobacco include small grains, grasses and corn. Long rotations (three to four years) are most effective in controlling black root rot, but where this is not practical, a two-year rotation may help. Planting tobacco in the same field year after year is a poor practice, even when resistant varieties are grown.

### **Cover Crops and Manure**

Cover crops should be plowed under at least three to four weeks in advance of transplanting. This allows for decomposition of the organic matter before the tobacco plants are set in the field. Applying a portion of the crop's fertilizer at the time the cover crop is plowed down will hasten decomposition of the plant material. Manure should be turned under several months in advance of the normal setting date of tobacco.

### **Soil Reaction**

Maintain soil pH in the 6.1 to 6.5 range for burley and 5.6 to 6.0 for dark tobacco. A soil test should be taken to determine the need for lime and fertilizer.

### **Resistant Varieties**

All recommended burley varieties have some resistance to black root rot. However, previously recommended varieties VA 509 and MS Burley 21 x KY 10 have only low resistance to black root rot. These varieties should not be grown in soil infested with black root rot. The varieties MS KY 14xL8, Coop 313, R7-11, Clay 403 and R-610 have medium

levels of resistance. Coop 543, Clay 501, TN 90, NCBH 129, KY 907, TN 97 and TN 86 have high resistance. Another variety previously recommended that has high resistance to black root rot is KY 17.

The recommended dark fire-cured varieties with resistance to black root rot are DF 485, DF 911, TN D950, KY 190 and TN D94, which are highly resistant. The only dark air-cured variety with resistance is KY 180.

## BURLEY TOBACCO

		Disease Resistance Rating					
UC	UC LBS/ ACRE	BLACK <sup>5</sup> SHANK RACES 0 1	BLACK ROOT ROT	WILDFIRE	(TMV) TOBACCO MOSAIC VIRUS	(TVMV) TOBACCO VEIN MOTTLING VIRUS	(TEV) TOBACCO ETCH VIRUS
<b>BLACK SHANK-SUSCEPTIBLE</b>							
MS KY 14 xL8 <sup>2</sup>	3128	10 0	Medium	High	High	High	None
KY 907	3257	2 2	High	High	High	High	High
Coop 313	3118	1 1	Medium	High	High	None	None
R7-11	3280	0 0	Medium	High	High	None	None
NCBH 129	3226	1 1	High	High	High	None	None
Clay 403	3329	0 0	Medium	High	High	None	None
<b>BLACK SHANK-RESISTANT</b>							
TN 86	3165	4 4	High	High	None	High	Medium
TN 90	3072	4 4	High	High	High	High	Medium
Clay 501	2961	6 6	High	High	High	None	None
Coop 543	2779	6 6	High	High	High	None	None
R-610	3076	4 4	Medium	None	None	None	None
TN 97	3124	5 5	High	High	High	High	Medium
<b>DARK TOBACCO</b>							
<b>Fire-cured<sup>3</sup></b>							
Certified Madole	2221	None	None	None	None	—	—
T.R. Madole	2420	None	None	None	None	—	—
TND950	2407	Medium	High	High	High	—	—
DF485	2493	Medium	High	High	High	—	—
DF911	2250	None	High	High	High	—	—
KY190	2078	Medium	High	High	High	—	—
TN D94	2256	Medium	High	High	High	—	—
<b>Air-cured<sup>4</sup></b>							
KY 160	1899	None	None	None	High	—	—
OS 802	1957	Medium	None	High	High	—	—
KY 180	1923	None	High	High	High	—	—

\* Average of 1993-1998 at TES and HRES for burley and 1993-1996 for dark types. These yields are for relative comparisons only and should not be used as an expectation of actual production per acre.

\* Although highly resistant to Race 0, L8 hybrids have no resistance to Race 1 black shank that is present on many farms. Therefore, the best choice would be not to plant these hybrids on fields known to be infested with black shank.

\* Yields are averaged for 1992-95 at HRES.

\* Yields are averaged for 1992-93 at HRES.

\* Burley Black Shank Ratings - Black shank resistance rating of 0 = no resistance and 10 = greatest resistance.

Note that 14xL8 is completely resistant to race 0 but totally susceptible to race 1 black shank.

### **Precautionary Statement**

To protect people and the environment, pesticides should be used safely. This is everyone's responsibility, especially the user. Read and follow label directions carefully before you buy, mix, apply, store, or dispose of a pesticide. According to laws regulating pesticides, they must be used only as directed by the label.

### **Disclaimer Statement**

Pesticides recommended in this publication were registered for the prescribed uses when printed. Pesticide registrations are continuously being reviewed. Should registration of a recommended pesticide be cancelled, it would no longer be recommended by The University of Tennessee.

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