Peanut Wilt Caused by
Pythium myriotylum

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A wilt disease of unknown cause has been observed on
peanuts, Arachis hypogaea L., in Virginia for several
years. The disease acquired the name "X-wilt" about
1957 when attempts to identify the causal organism
(K. H. Garren, L. I. Miller, personal communications)
were unsuccessful. Before 1966 the disease occurred
sporadically, and often was limited to patches of plants
scattered throughout fields. Epiphytotes with spectacular
symptoms occurred in Virginia in 1966-67, and in some
fields many plants died. This is a report on investiga-
tions after 1966 which showed that "X-wilt" is caused
mainly by Pythium myriotylum Drechs. "Pythium
wilt" is now suggested as a better name for this disease.

This disease is usually first noticeable in mid-August,
when leaflets and petioles of the growing shoots of in-
fectected plants wilt. If hot, dry conditions prevail, more
leaflets and petioles wilt, until eventually the entire
plant is affected. At first, wilted plants usually recover
their turgidity at night, and many outgrow the disease.
Occasionally, wilt symptoms appear suddenly, and
plants are quickly killed.

Shortly after the appearance of wilt symptoms,
leaflets become chlorotic or light green in color. Leaflet
margins puckers, and an adaxial curling or rolling oc-
curs, starting at the apical end of the leaflet. Some
leaflets eventually fold, gradually turn brown, and shed
prematurely.

The root systems of severely wilted plants are
greatly reduced by deterioration of the lateral and
fibrous roots. Roots are dark brown and almost devoid
of nodules. During early stages of infection, the vas-
cular tissue of the tap root turns light brown. This
discoloration may extend from the tip of the tap root
to several cm into the stem. In advanced stages of in-
festation, the vascular tissue of the roots turns dark
brown, and the cortical tissue turns almost black and
sloughs easily. At this point the discoloration extends
into the primary and lateral branches of the stem,
and in some cases may be found in the vascular tissue
of the petioles.

Plants that wilt early in the season (prior to 15
August) usually have a considerable number of pods
affected by pod breakdown (3). Those plants on which
symptoms are first visible late in the growing season,
or shortly before harvest, seem to have little pod
breakdown.

<table>
<thead>
<tr>
<th>Source</th>
<th>Slightly Wilted</th>
<th>Severely Wilted</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hypocotyl</td>
<td>55</td>
<td>80</td>
</tr>
<tr>
<td>Wood</td>
<td>40</td>
<td>15</td>
</tr>
<tr>
<td>Pith</td>
<td>20</td>
<td>0</td>
</tr>
<tr>
<td>Cortex</td>
<td>60</td>
<td>10</td>
</tr>
<tr>
<td>Taproot</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lateral Roots</td>
<td>25</td>
<td>2</td>
</tr>
<tr>
<td>Fibrous Roots</td>
<td>8</td>
<td>0</td>
</tr>
</tbody>
</table>

*Plated on CMAP (3).

From 1966-68, P. myriotylum was isolated consis-
tently from roots or pieces of vascular tissue from
the tap roots of wilted plants on CMAP (3) and corn-
meal agar (CMA). The isolation frequency of P.
myriotylum from different parts of infected roots
plated on CMAP is shown in Table 1. Other Pythium
spp. were encountered infrequently.

Inoculation tests were conducted with isolates of P.
myriotylum. A fungal suspension was prepared by
scraping the surface of 6-day-old cultures of P. myrio-
tylum growing on CMA and blending with sterile
water for 3 sec. A control suspension was similarly
made from sterile cornmeal agar. Washed roots of 3-
month-old peanut plants (var. Virginia Bunch 46-2)
were suspended in these aqueous suspensions for 30
min and immediately planted in 10-inch clay pots con-
taining sterilized soil. Pods were watered to field ca-
acity and shaded; plants were observed daily for
signs of wilt.

Inoculated plants were healthy 4 days later, but by
the 7th day most of them showed wilt symptoms.
Symptoms intensified gradually, and most of the in-
oculated plants died within 3 weeks (Fig. 1). A few
inoculated plants showed early wilt symptoms but ev-
etually recovered. In contrast to control plants, new root
growth was not discernible at 21 days in the inocu-
lated plants (Fig. 2). Vascular tissue of inoculated
plants was discolored, and microscopic examination
of the root pith revealed many Pythium oospores. P.
myriotylum was easily isolated from such material.

Since Drechsler (1) named this fungus in 1930, the
number of known hosts of P. myriotylum has increased
greatly, but this appears to be the first proof that it
can cause a vascular wilt of peanuts. Perry (7) and
Jackson & Bell (4) found this fungus associated with
wilted peanuts, but did not test its pathogenicity. In
a note distributed to some North Carolina county ex-
tension personnel in 1965, W. E. Cooper and J. C.
Wells described symptoms of a wilt of peanuts which
they suspected was caused by a Pythium sp.

The report of McCarter & Littrell (5), showing that
rye (Secale cereale) and rye grass (Lolium multi-
florum) are susceptible to P. myriotylum, is of interest
to Virginia peanut growers, most of whom use rye in
rotation with peanuts. Since rye or rye grass is almost
always the cover crop in the peanut-corn-peanut stan-
standard rotation, a rapid build-up of inoculum could occur in most Virginia fields.

Middleton (6) noted that *P. myriotylum* was encountered only in the warmer climates of the world. Waterhouse & Waterston (8) defined its optimum and maximum growth at 37 and 44 C, respectively. In Virginia, Pythium wilt is usually more evident in August and September, during the period when soil temperatures reach their maximum.

Garren (3) recently demonstrated that *P. myriotylum* was one of the causal agents of peanut pod breakdown. Frank (2) also showed it causes pod breakdown of peanuts in Israel. Thus, *P. myriotylum* appears to be involved in two distinct disorders in peanuts.

**LITERATURE CITED**