



Anthracnose of cowpea

Colletotrichum destructivum

SUMMARY: Anthracnose of cowpea is a fungal disease affecting stems, branches, and leaf and flower stalks. Previously, it was thought to be caused by the same fungus that attacks *Phaseolus* beans, but is now considered a separate species, *Colletotrichum destructivum*. Epidemics start when infected seed is planted. Brown spots appear on the foliage and produce large numbers of spores, which are then spread by rain-splash and in wind-driven rain. The disease occurs in high rainfall parts of Latin America, Asia and Africa (especially the rainforest zone of southwest Nigeria). Important management measures involve the use of tolerant or resistant varieties, seed treated with fungicide and intercropping with cereals.

KEY SIGNS

An anthracnose fungus, *Colletotrichum destructivum*, causes a major disease of cowpea (*Vigna unguiculata*) which is grown for pods, leaves and fodder. Anthracnose means 'coal disease'; it is a term used for diseases caused by fungi that produce dark spots on leaves, petioles, stems and fruit. Anthracnose fungi are invariably associated with wet weather.

The spots are tan to brown, sunken and, on susceptible varieties, they circle the stems, branches, leaf and flower stalks. Infections on the stems are particularly damaging.

MANAGEMENT

Prevention – what to do before signs are seen

Cultural approaches: The best way to manage the disease is by planting anthracnose-resistant varieties¹. Check with retailers before purchasing. Many varieties have now been bred for different types of resistance to anthracnose.

One option is to intercrop cowpea with other food plants to reduce the crop density and, therefore, the impact of the disease. Intercrops of cassava, millet and sorghum are possibilities. A 2-row cereal:4-row cowpea cropping system has resulted in 1-2 cowpea crops in the same season, with acceptable cereal yields.

Chemical approaches: It is very unlikely that fungicides would be economical for the control of this disease, or that they would be effective. However, if a fungicide was required on, for instance, plants grown for seed, use mancozeb, copper compounds or chlorothalonil. The appropriate times to apply fungicides are: (i) at flower set; (ii) late flowering; and (iii) pod fill.

Control – what to do after signs are seen

Cultural approaches: Do not plant next to already infected crops, otherwise the new planting will be infected at an early growth stage and the impact of the disease will be greater.

After harvest, and after collection of vines for fodder, remove or plough in debris. Leave two years before planting cowpea on the same land.

CAUSE

Since the 1990s *C. destructivum* has been accepted as distinct from another anthracnose disease caused by the fungus *C. lindemuthianum*, anthracnose of *Phaseolus* bean. Mostly, the fungi associated with anthracnose of cowpea do not infect common bean, nor lima bean, groundnut, soybean, pigeon pea, pea, chickpea, lucerne and adzuki bean in laboratory tests, or they infect only some of these. This indicates that there are different races of the fungus, and at least two distinct races occur in Nigeria.

Spores are produced in large numbers in the spots. These are spread by rain-splash to nearby plants and further afield in wind-driven rain. Humans and machinery moving through the crop, especially when it is wet, also spread the fungus.

A key feature of this disease is that the fungus infects the seeds, i.e. the disease is seed-borne. Cases have occurred

¹Note IITA has developed varieties with combined resistance to several viruses, bacteria, fungal diseases, nematodes and insects, including anthracnose. These varieties also have improved tolerance to heat, drought, low P, and have been bred for differing times to maturity.

where up to 40% of the seeds have found to be infected. Consequently, the seeds allow survival of the fungus through the dry season and ensure that it is well placed to continue its life cycle when the rains come. Being seed-borne also provides a way for long-distance spread of the fungus.

The disease can last for at least two years in diseased stems of plant debris. It can survive both on the soil surface and buried in soil.

IMPACT

The disease is severe in high rainfall areas of Africa. It also causes economic loss in tropical regions of Latin America and Asia. In the rainforest zone of southwest Nigeria, losses up to 50% have been reported, particularly where cowpea is grown as a monocrop; however, in recent years the impact has declined with the use of resistant varieties. Similarly, losses of grain yields have been reported from India but, here too, resistant varieties have been identified although, because there are different races of the fungus, the reaction of varieties is not the same in all environments.

DISTRIBUTION

The disease is reported in North America, South America (Brazil), south Asia (India and Pakistan) and Africa (Nigeria, Uganda and Zambia).

FURTHER READING

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