

# Anthracnose of Dry Bean

Maryke Craven and Hangwani Muedi  
ARC-Grain Crops Institute, Potchefstroom

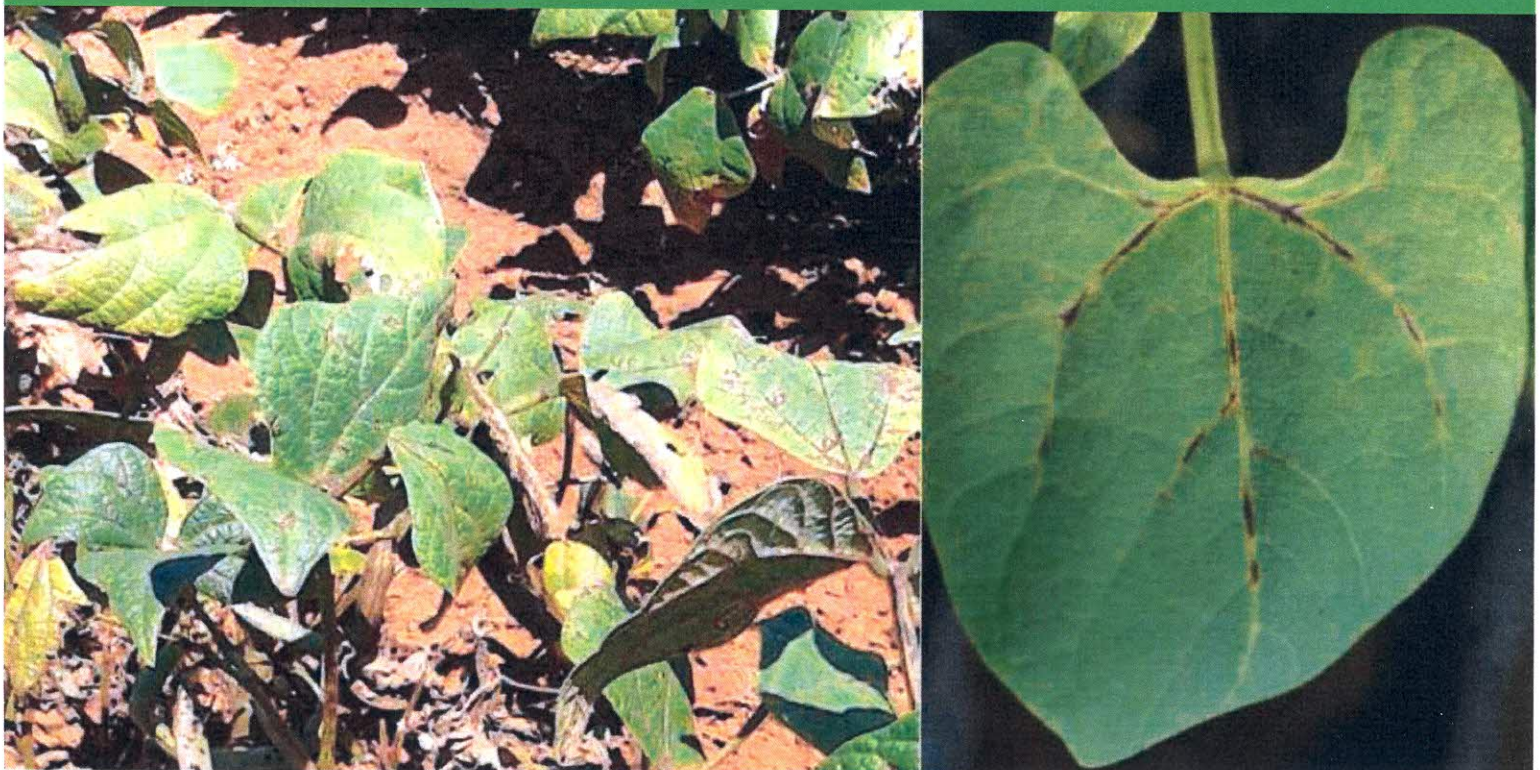
Photos provided

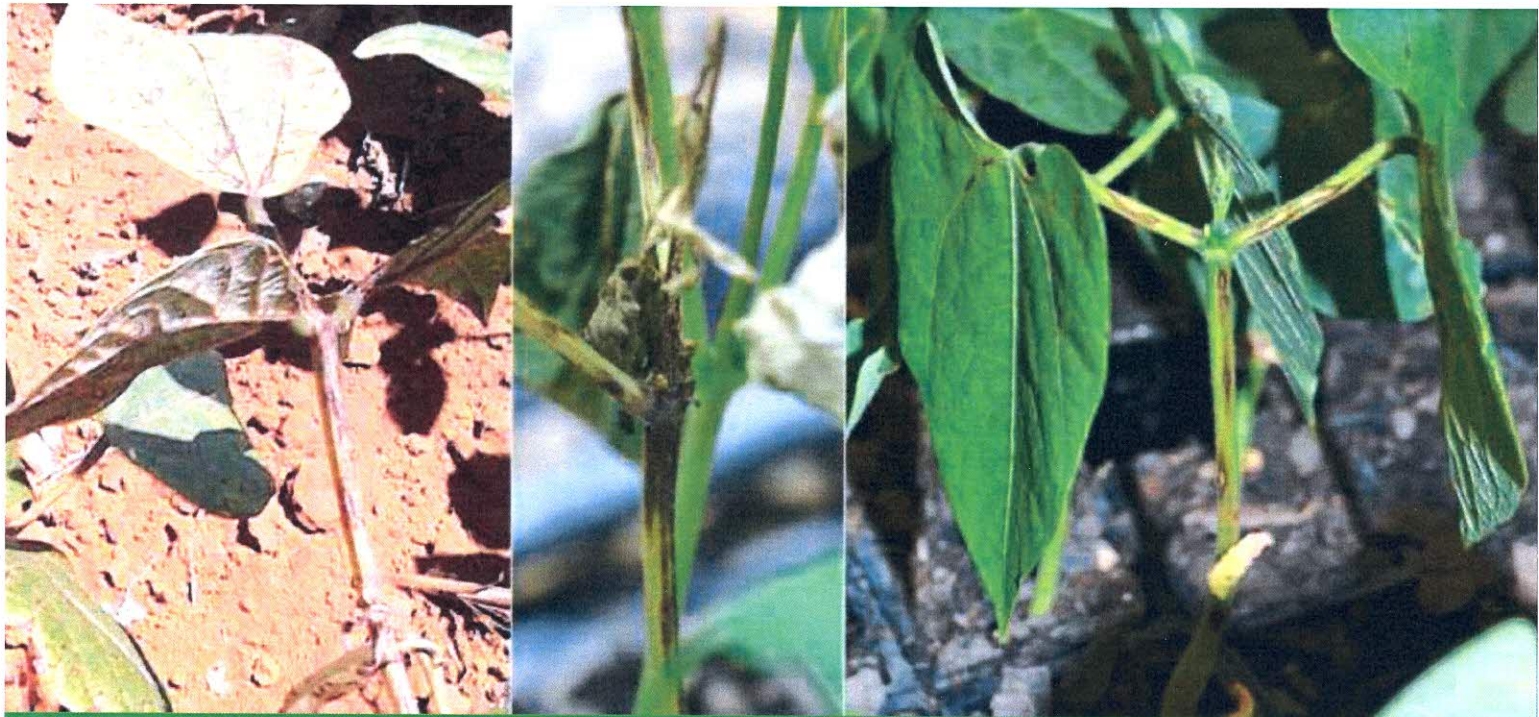
**A**nthrachnose occurs anywhere in the world where beans are produced and is considered one of the most invasive and destructive dry bean diseases, capable of destroying up to 95% of a plantation's yield while also threatening growth and development rates, as well as pod and seed quality. It is caused by the fungus *Colletotrichum lindemuthianum* and is more common in moderate and sub-tropical climate areas. The disease is mainly seed-borne and has a wide host range which includes many

legume species. In South Africa the disease is most common in KwaZulu Natal, Mpumalanga and parts of Limpopo.

Initial symptoms tend to appear on the veins on the underside of leaves. Younger lesions are brick-red, which later turn darker (blackish) in colour (Figure 1). From here, lesions spread to the upper side of the leaves as well as the stems (Figure 2). The most common symptom of the disease is, however, the lesions produced on the pods. These lesions

Figure 1. Anthracnose symptoms on bean leaves.





**Figure 2. Anthracnose symptoms on seedling and adult plant stems.**

manifest initially as small reddish-brown to purplish spots on the pods which are slightly sunken. As time progresses, the spots develop into larger (5 to 8 mm) and darker sunken lesions (Figure 3). Under moist conditions sticky pinkish droplets can be observed in the centre of the lesions which contain spores of the fungus. Under severe infections, lesions can be observed on the seed itself. When such infected seed germinates, the hypocotyl (growth point) becomes infected. Next, the stem of seedlings shows the trademark symptoms, which can weaken the stem to such an extent that it can actually break off.

Producers who accordingly hope to save money by planting their own seed from the previous season, can be setting themselves up for a potential 100% yield loss, should environmental conditions develop that are suitable for disease development. Even mild levels of infected plants, can result in astronomic yield losses the following season should their seed be planted. Environmental conditions suitable for the disease to develop include cool and humid conditions, with symptoms appearing at temperatures between 13-26 °C, 17 °C being the optimum temperature for disease development. Continuous rain and high humidity

are also requirements for disease development. Temperatures outside the range of 7-33 °C can delay the development of this disease.

The fungus can survive in the field on crop residue for a period of up to two years. As already stated, the pathogen can also survive and be transmitted via contaminated seed. Within the crop, fungal spores are spread through rain splash and wind, with heavy showers being able to spread spores 4.5 m from an infected plant.

The use of disease-free seed remains the primary control measure in the prevention and spread of the disease. Planting resistant cultivars also serve as a long term and environmentally friendly disease control measure. Once anthracnose has become a problem in a specific field, producers should refrain from planting beans on, or close by the field for a period of two to three years. Movement within an infected field should be restricted and producers should avoid cultivation or harvest activities when the crop is wet. Rotation with non-hosts such as maize, sunflower and wheat is recommended, while good sanitation, including removal of infected plant residues, will assist to reduce inoculum pressure. Suitable fungicides will also help to manage

