Ascochyta blight of the common bean (Phaseolus vulgaris L) is a seed-borne disease occurring worldwide. The disease is caused by the fungus Phoma exigua var. exigua and has the potential to cause severe yield losses. It is accordingly regarded as a major economically important disease of the common bean in some parts of the world.

Information on the exact yield impact in South African dry bean producing fields is currently unavailable, however, epidemics of the disease have been reported in Western Europe and East Africa. Experimental losses of 43% in dry bean yield has been reported elsewhere in the world.

Favouring weather conditions
Environmental conditions favouring the onset and development of these symptoms include cool to moderately cool temperatures (16 - 24 °C), high humidity, and rainy and misty weather. The pathogen becomes inactive at temperatures above 30 °C.

Reported cases in South Africa

Symptoms of the disease
The disease usually appears at the early pod development stage and becomes more severe during the further development of these pods. Small, circular, dark-brown spots appear on the leaves first, and later on the leaves and pods. Lesions then become dark-brown to black and is characterised by clearly visible concentric rings (Figure 1). The concentric ring lesions measure about 10 - 30 mm in diameter and mostly contain small, black pycnidia (spore-bearing structures). Lesions on the leaves may coalesce and cover most of the leaf surface area. Severely infected plants show a tattered appearance of the canopy (Figure 2) accompanied by a significant loss of leaves (senescence). Lesions on the pods are sunken, divided into zones with a pale centre and dark margins, and are usually covered by several pycnidia (Figure 2).

Pod drop associated with the disease has also been reported elsewhere in the world with the associated negative yield potential of the crop. Lesions on pods may also serve as a contamination source for seed infection. Seeds that are infected display a brown to black discolouration, rendering them poor for both seed and grain markets.

The spread of the disease
Infected seeds are the main form of long-distance spread of the disease, whereas short-distance spread is carried out by wind and raindrop pycnidiospores. Although the disease has long ago been identified, ascochyta is considered an emerging disease on account of several ‘first time incident’ reports of the disease in many common bean producing areas around the world. Ascochyta blight may therefore have occurred in only a few parts of the world at significantly high levels in the past, while it has either not been an economically important disease in the majority of bean producing areas, or it has been absent altogether.

In South Africa, ascochyta blight was only reported once, during the 1980’s, in Mpumalanga, the Eastern Cape and KwaZulu-Natal. Recently, the disease has continuously been observed at Cedara Research Station (29°31’43"S, 30°15’56"E) of the Agricultural Research Council near...
Pietermaritzburg, KwaZulu-Natal, and in some small-scale farmers’ fields around the area.

At Cedara, the incidents and severity of the disease appear to be increasing over the past few years. Previous reports have referred to *P. exigua var. exigua* as a weak pathogen that often requires damage for infection to occur, and only produces brown specks on mature pods.

However, the severity of the disease at Cedara is high on different common bean genotypes consisting of South African cultivars and selected varieties from the germplasm collection, with disease rating scores of up to eight on a one to nine modified CIAT rating scale, where one is resistant and nine susceptible. (The pathogen is known to produce phytotoxins which may be considered for biocontrol of perennial weeds.)

**Impact on production**

Ascochyta blight of the common bean can have a severe impact on production, especially in areas with favourable climatic conditions. Once considered weak, the disease-causing pathogen has demonstrated aggression with recurring natural infections in the field in KwaZulu-Natal. With the potential of climate change and its possible impact on plant-pathogen interaction, the possibility exists of the disease spreading further than the KwaZulu-Natal province if the environmental conditions are favourable. Dry bean farmers are therefore encouraged to be on the lookout for the ascochyta blight and act promptly when the first typical disease symptoms are spotted. Quick remedial action is encouraged.

**Control**

The disease is controlled by the use of suitable fungicides (consult your chemical company), preferably protectants, and practising good sanitation. This includes deep ploughing of the infected debris after harvesting and the removal of volunteer plants. Other disease management methods, such as crop rotation with non-host plants and the use of seed mixtures and multi-lines, should also be considered.

Since the disease is known to be seed-transmissible from previously infected seeds, the use of certified disease-free seed is therefore very important as a preventative disease management measure.

Variation of dry bean cultivars’ response to the ascochyta blight infection was once reported in a greenhouse experiment. However, the response was insignificant in field trials, suggesting the unavailability of good sources of resistance to the disease in South Africa. There is currently no dry bean cultivar known to contain resistance to ascochyta blight in South Africa.

**Dry bean producers are welcome to contact Dr Hangwani Muedi of the ARC-Grain Crops regarding the disease on 018 299 6441 or at MuediH@arc.agric.za.**