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BEAN DISEASES IN JAMAICA

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Dry beans *Phaseolus vulguaris* L., known in Jamaica as 'red peas' are grown throughout the year in various parts of that island. Several local lines and a few imported Red Kidney varieties are grown, particularly Charlevoix. In general, the yield of dry beans is considered to be low (700–1,000/lbs acre) and one of the most important contributory factors to this low average yield is the high incidence of diseases. Several diseases have been reported on beans in Jamaica (1).

A preliminary assessment indicates that the following are either serious or potentially serious diseases of bean in Jamaica:—

Angular leaf spot	Anthracnose	Powdery mildew
Rhizoctonia root rot	Rust	Southern blight
Bacterial blight	Mosaic	

A few diseases of minor importance also have been observed. These are leafspot diseases caused by *Cercospora* and *Alternaria*, downy mildew caused by *Phytophthro parasitica*, and dry root rot caused by *Fusarium solani* f. sp. *phaseoli*. *Angular leaf spot* is caused by the fungus *Isariopsis pariseola* Sacc. It is characterised by the striking angularity of the lesions on the foliage. The lesions which are at first greyish and later brown, are markedly limited by the major and minor veins, hence the angularity. Lesions of various sizes also are produced on the pods. Numerous columnar out-growth generally are produced on the uudersurface of infected portions of the leaves. These, in fact, are aggregations of conidiophores which bear the spores of the pathogen. There is evidence that the fungus is sced borne. Most varieties are susceptible. This disease is quite widespread in Jamaica, but it apparently is rarely very serious.

Anthracnose is caused by the fungus *Colletrotrichum*

Lindemuthanium (Sacc. and Magn.) Scrib. The symptoms of this disease are most conspicuous on the pods where the lesions first appear as small reddish spots. These enlarge into roughly circular depressed areas of various sizes, each with a reddish-brown border. In wet weather, a pinkish ooze containing numerous one-celled sporcs is produced in the sunken lesions.

The fungus also produces lesions on the stems, petioles and leaf veins. At least four races (alpha, beta, gamma, delta) of this pathogen are known and a variety which is resistant to one race may be quite susceptible to one or more of the other races. This pathogen also is seed-borne.

Cool temperatures favour the casual organism. The disease, therefore, appears to be important mainly in the hilly areas particularly in the cooler months.

Rust is caused by the fungus *Uromyces phaseoli* var. *typica* Arth. It is principally a disease of the leaves on which symptoms appear as rusty brown pustules containing hundreds of urediospores. Several physiologic races are known.

Like Anthracnose, this disease appears to be of importanee mainly in the hilly areas especially in the cooler months.

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Rhizoctonia root rot and Southern blight—These diseases are caused by two-soil-inhabiting fungi—*Rhizoctonia solani* Kuhn and *Sclerotium rolfsii* (Curzi) West, respectively. Rhizoctonia causes damping-off of seedlings and rot of the roots and hypocotyls of older plants.

Southern blight is easily detected by the white mycelium and the round, brown sclerotia which are produced at the base of the plant at or slightly below the soil level. The sclerotia closely resemble cabbage seeds. In Jamaica, it has been observed mainly as a disease of young bean plants. The fungus causes decay of the hypocotyl at or just below soil level and results in rapid wilting and death of the plant. This fungus may drastically reduce stands.

Powdery mildew is caused by the fungus *Erysiphe polygoni* D.C ex Merat., the imperfect stage of which os Oidium sp. All the above-ground parts of the bean plant are susceptible to attack. The leaves are generally attacked first, but later the pathogen spreads to the stems and pods.

The early symptoms appear as darkened spots on the leaves. These spots soon become covered with a talcum-like substance which, in fact, is a mixture of white mycelia and conidia of the pathogen. Eventually, the whole leaf may appear as if dusted with a white powder, hence the name powdery mildew.

This disease is one of the most important diseases of beans in Jamaica. It is very widely distributed and can be quite serious on both dry beans and snap beans.

Common bacterial blight is caused by *Xanthomonas phaseoli* (E.F. Smith) Dows. The symptoms first appear as small, light green areas on the leaf. The lesions quickly enlarge and the centres become dry and brown with a narrow yellow halo. On pods, water-soaked lesions are produced. This disease is seed-borne and is apt to be serious in Jamaica mainly in wet weather.

Mosaics. Mosaic diseases are caused by viruses several of which attack beans. The principal mosaic diseases of beans are common bean mosaic, yellow bean mosaic, southern bean mosaic and severe bean mosaic.

In general, the mosaic diseases cause leaf mottling and various types of leaf mal-formations, e.g., reduction in size, alterations in shape and pukering. The mottling generally consists of irregular patches of yellow and green areas on the leaf. Infected plants are stunted and yields are drastically reduced. There is some measure of overlap in the symptoms caused by the different viruses on beans in the field. In addition, symptoms vary somewhat with the strain of the particular virus, the bean variety, the age of the plant at time of infection and the environmental conditions. Under field conditions, yellow bean mosaic is distinguishable from common bean mosaic by the intense contrast between the yellow and green areas of the leaves. This contrast becomes even more pronounced as the plants mature.

Mosaics are the most serious diseases of beans in Jamaica. At least two mosaic diseases have been observed—common bean mosaic and yellow bean mosaic, the latter being more prevalent. It is the general feeling that the local types are more tolerant to common bean mosaic than the imported Red Kidney types and this may account for the scarcity of common bean mosaic. Common bean mosaic is seed transmitted but yellow bean mosaic is not.

Yellow bean mosaic has been observed on all the local varieties (Miss Kelly, Cockstone, Red Round, Portland red and Long red). In addition, it has been observed

on two snap bean varieties, Contender and Harvester, both of which are known to resistant to common bean mosaic virus and its variant strain.

Mosaics are also quite common on other legumes in Jamaica. So far, we have mechanically transmitted to bean a virus from *Macroptilium lathyroides* (L.) Urb. (*Phaseolus lathyroides*), a common weed and one from *Phaseolus lunatus* and obtained symptoms on bean which were very similar to the symptoms produced by the yellow bean mosaic virus. We are now in the process of testing the transmissibility of viruses from other legumes and malvaceous weeds.

The diseases in Jamaica are quite similar to bean diseases which are found elsewhere (2). It should be noted also that many of the diseases are seed-borne. Our main approach to control, therefore, is through the production of disease-free planting material. In addition, attention is being given to chemical control of the foliar diseases, crop rotation and the selection and breeding of resistant varieties.

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