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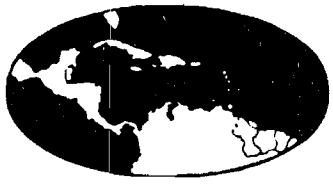

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C. PLANT PROTECTION

DISEASES OF BEANS (*Phaseolus vulgaris*) AND THEIR CONTROL IN JAMAICA

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ABSTRACT

Almost every year in Jamaica the presence of several diseases cause severe loss of yield to the bean crops planted throughout the island. The accompanying financial loss is usually great. This paper presents tne more important diseases of beans encountered and methods that can be used to control them are given.

Some of these diseases are as follows:

Powdery mildew	-	*Oidium* sp.
Bacterial blight	-	*Xanthomonas phaseoli*
Anthracnose	-	*Colletotrichum lindemuthianum*
Leaf spots	-	*Cercospora* spp. & *Isariopsis* sp.
Rust	-	*Uromyces appendiculatus*
Fusarium root rot	-	*Fusarium* spp.
Mosaic	-	Virus
Root knot	-	*Meloidogyne* spp.

Almost every year in Jamaica the presence of several diseases causes severe loss of yield to the bean crops planted throughout the island. The accompanying financial loss is usually great and the annual importation of dried beans (known locally as red peas) is tremendous. There is also substantial loss of string beans and it is not unusual for a farmer to be unable even to meet his planting expenses at the end of a bean crop.

A number of diseases are carried in the bean seeds and certified disease-free seeds are not usually available. Farmers, therefore, save seeds from crop to crop or purchase planting material from local agents. Disease agents are therefore carried from one crop to the next thus contributing to the low yields usually obtained.

During 1963 work was started by the Plant Protection and the Agronomy Divisions of the Ministry of Agriculture and Lands to improve the production of beans in Jamaica by introducing new varieties and selecting seeds for propagation from apparently disease free plants. As a result of this work the Charlevoix variety which has a large very red seed was obtained and fairly large quantities are being grown by farmers. This variety, though a heavy bearer, is also susceptible to many diseases and also carries some of the disease causing agents in the seeds.

Efforts are being made to select seeds from healthy plants of the two most popular local varietis, Miss Kelly and Round Red, to try and provide better seeds for planting than were previously available. The Keystone Seed Company, one of the large seed suppliers in the United States of America, has been requested to produce certified disease free seeds of the Charlevoix variety for use in Jamaica or elsewhere and work on this is progressing. Meanwhile, disease control measures have to be adopted to reduce the incidence of diseases in successive crops and fungicide and insecticide applications have to be carried out.

Some of the more important bean diseases encountered in Jamaica and the methods of control are listed and discussed. These diseases are as follows:

Powdery mildew	-	Oidium sp.
Bacterial blight	-	Xanthomonas phaseoli
Anthracnose	-	Collectotrichum lindemuthianum
Leaf spots	-	Cercospora spp. and Isariopsis sp.
Rust	-	Uromyces appendiculatus
Fusarium root rot	-	Fusarium spp.
Mosaic	-	Virus
Root knot	-	Meloidogyne spp.

Powdery mildew - Oidium sp.

This occurs as a white powdery growth on the leaves, stems and pods. The powdery mass is the mycelium and spores of the fungus which covers portions of the plant. Pale yellow discolourations are usually the first indication of infection followed by the appearance of the white growth and browning and ultimate death or deformity of the affected parts. Heavy infection causes leaf fall or reduction in leaf area with ultimate reduction in yield.

Karathane fungicide at not more than 3/4 lb. per 100 gallons water high volume or 20 gallons low volume per acre gives good control of powdery mildew. This should be applied once a week using 3 or 4 applications. Other fungi- such as zineb, maneb, cupro-maneb or copper fungicides also give control if used at approximately 2 labs. per acre.

Bacterial Blight - Xanthomonas phaseoli

This bacterial disease produces small water-soaked spots on leaves, stems and pods. These areas enlarge, coalesce and become brown usually with a yellow coloured border. A sunscald appearance may be produced on the leaves and the spots become necrotic. Small brown flecks are produced all over the leaves and girdling of the stem may occur. Affected pods have a greasy appearance and some of the seeds in these pods are

shrivelled. There is usually a yellow deposit of bacteria under the seed coat.

The use of disease free seed is the best method of controlling this condition. Copper sprays may be applied and may give some control, but this disease is difficult to control with sprays.

Anthracnose - Colletotrichum lindemuthianum

The fungus causing this disease produces sunken brown spots on the seeds. If affected seeds are planted, seedlings will become infected early with small brown elongated spots on the stems which develop into sunken lessions. Growth of the fungus in the lessions may give them a pinkish colour. Infection also occurs on the leaves and pods, and on the pods the cankers may extend down to the seeds causing brown spots.

The use of a resistant variety such as Charlevoix is the best method of controlling this disease. Soaking the seeds in a mercuric seed dressing or treatment of seeds with other dressings is helpful. Copper fungicides such as Perenox and Cupravit or Dithiocarbamates such as Zineb and Maneb used at approximately 2 lbs. per acre and applied weekly for 3 or 4 times will give control of this disease.

Leaf Spots - Cercospora spp. and Isariopsis griseola

Cercospora produces circular brown spots on the leaves of affected plants while Isariopsis produces angular leaf spots which are confined by the veins. These lessions do not have coloured borders as in the case with bacterial infection.

Two or three applications of a copper or dithiocarbamate spray at two weekly intervals will control these leaf spots.

Rust - Uromyces appendiculatus

The fungus causing this disease produces small brown raised spots usually on the underside of the leaves. The pustules also occur on the upper surface and have a yellow area around some of the spots.

Resistant varieties are available but the presence of many races of the rust organism renders some of these varieties susceptible when grown in different areas.

Spraying with a copper or dithiocarbamate fungicide may be done but this may not be economical.

Fusarium root rot - Fusarium spp

This disease causes a red discolouration of the tap root below ground level. The small lateral roots are killed and affected plants wilt.

Control of this soil borne disease is very difficult as soil treatments are uneconomical and often ineffective. Crop rotation offers some promise and the use of resistant varieties offers the best hope of control. Most varieties of beans, so far, are susceptible.

Mosaic - Common bean mosaic and other viruses

This is caused by a complex of viruses. The common bean mosaic is prevalent in Jamaica causing yellow mottling of leaves of affected plants. Yield is greatly reduced and the virus is carried over in the seed from crop to crop.

There are many varieties of beans that are resistant to common bean mosaic and a number of these have been tried in Jamaica without much success as they have been found susceptible to other viruses and other disease organisms. Use of certified disease-free seeds offers the best prospects of control of this disease, but certified seeds have not been available.

Root Knot - Meloidogyne spp.

Root knot disease is caused by nematodes which produce enlargement of roots of many plants. The water conducting vessels are blocked ultimately causing the plants to wilt.

Fumigating of soil with DD has been tried with fairly good results but rotation is more economical.

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CONTROL OF BIRD DAMAGE IN TOMATOES IN BARBADOS

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ABSTRACT

Loss of tomatoes by bird damage in Barbados frequently averages over fifty percent of mature fruit. Various methods have been tried to reduce this damage, including bird scares and nylon netting covers. More recently an experiment has been done to test the effectiveness of bagging the entire