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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

V. A. L. Sargeant and W. DeC. Jeffers

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

plant with plastic. The control of insect pests in this system was less efficient than in "open" plants. The seasonal effects of fungal attacks and blossom end rot need further study in this system, as does the behaviour of different varieties.

INTRODUCTION

The production of tomatoes in Barbados is seasonal. The bulk of the crop is produced in the dry season -- December to May. The crop in the wet season is limited in yield by fruit rots and fungal infestation and in spite of spraying, the yields are generally low.

The standard method of cultivation is on 5' banks (with a spacing of 18" x 18") and the plants are grown without staking or pruning. The most popular variety is Bounty.

The major pest of tomatoes in Barbados is birds. Fruits are attacked from the very early stages by blackbirds (*Tuisqualis sortirostris*) and sparrows (*Pyrrhulagra barbadensis*). Some varieties are attacked earlier and more severly than others. Varieties with lesser foliage and high exposure of fruit are the worse attacked. These attacks do not appear to be seasonal and crop throughout the year is damaged to the extent that on the average over fifty percent of the fruit set cannot be marketed. The damage is worse in some areas than in others, the worse areas being those near woodlands. The net effect of the bird damage is that marketable yields are low and a relatively high price per pound of marketable fruit is expected and in fact obtained; prices ranging from 20 to 80 cents per pound. Farmers tend to restrict production so as to obtain these prices which they consider economic and consequently relatively small acreages are grown. If bird damage could be controlled, the crop would reach the market in larger quantities at lower prices and with greater net profit to the producer.

RESULTS

Previous attempts at control

In the past several attempts have been made to try and control this hazzard.

(1) The use of Sarran Netting.- This has been successful in curtailing bird damage, but the capital outlay is so high, that it limits the number of producers who could make use of it.

In 1964 a "Sarran house" covering 2,500 sq. ft. was built at a cost of BWI $400.00 for growing tomatoes on stakes. Yields were satisfactory and bird damage was completely avoided. The cost of the Sarran house should be written off in five years.

The area of Sarran netting supported wire stretched on to stakes to form a "tent" over the plants reduced bird damage. This tent although cheaper than the "Sarran house" involved more labour in spraying and harvesting.

(2) "Bird Scares" - In the early stages of fruiting, bird scares of one sort or another have been used ranging from bits of plastic (attached to posts) and flying in the breeze, to patented red and silver foil also attached to posts.

In the early stages or shortly after erecting these scares, the birds are kept away but they apparently soon become accusfomed to the fact that these scares are harmless and eventually return to continue feeding on the fruits. These scares have some effect in reducing the incidence of damage and their cost is low but they are not completely satisfactory.

(3) The use of Polyester Fibres - An entangled mesh of nylon fibres is suitable for growing plants in such a way as to entrap insects. One such product "Crylde" was tried with tomatoes with little success on account of inadequate coverage of the plants.

(4) Use of plastic bags to cover fruits - The covering of clusters of fruit with small plastic bags has been carried out to a limited extent, with varying degrees of effectiveness. It has been reported that fruits grown in this way have been scorched where the plastic rests on the fruits.

Current Research

More recently, in April 1956, the Ministry of Agriculture started experiments with perforated polythene tubing (similar to that used in the Banana Industry for encasing bunches for shipment). This tubing is wide enough to cover entire plants and is provided with air vents.

Twenty four plants selected at random on a small plot were covered with plastic tubing secured to the ground and tied to a staked height of 5 ft. 6 ins. when young fruits were just being damaged by birds. A similar number of exposed plants were selected. The production records shown in Table 1 gives some indication of the possibilities of using polythene tubing to curtail bird damage.

DISCUSSION

It was doubtful whether plants subjected to growth under field conditions within plastic tubing could survive Yields however were satisfactory.

There was no bird damage with the covered plants, whereas bird damage accounted for over fifty percent of the total number of fruits harvested from the uncovered plants.

Caterpillar damage and Blossom End Rot were somwhat higher from the covered plants than the uncovered plants. (Caterpillar Damage 77, Blossom End Rot 20 in covered as against 3 and 10 respectively in uncovered.

Whereas the uncovered plants were sprayed with insecticide, the covered plants were not, hence the higher rate of caterpillar damage. Blossom End Rot (B.E.R.) is believed to be associated with moisture requirements and calcium build up inthe tissues. It is felt that as a result of greater heat within the plastic tubing, thismight have had some effect upon moisture thereby resulting in a higher percentage of B.E.R.

CONCLUSION

It seems that there is scope for using plastic tubing and Sarran netting as a means of reducing bird damage to tomatoes. The plastic tubing method is cheap but further experiments to over come the effects of other pests like insect and fungal attacks and blossom end rot need to be investigated. The Sarran netting method is satisfactory but expensive. The "Sarran house" has the additional disadvantage of requiring the continuous use of a piece of land.

TABLE I

PLASTIC COVERED

Harvest	Saleable Fruits	Bird Damage	Caterpillar Damage	Blossom End Rot	TOTAL
1st	49	--	5	5	59
2nd	14	--	1	1	16
3rd	19	--	18	4	41
4th	68	--	53	10	131
TOTAL	150		77	20	247

UNCOVERED

Harvest	Saleable Fruits	Bird Damage	Caterpillar Damage	Blossom End Rot	TOTAL
1st	27	31	1	3	62
2nd	22	56	-	2	80
3rd	20	37	-	2	59
4th	39	48	2	3	92
TOTAL	108	172	3	10	293

Table 1 shows the number of fruit from covered and uncovered plants.

TABLE II

PLASTIC COVERED

Harvest	Saleable		Unsaleable		TOTAL	
	lbs.	ozs.	lbs.	ozs.	lbs.	ozs.
1st	9	12	2	6	12	2
2nd	2	8	0	4	2	12
3rd	3	8	2	6	5	14
4th	8	5	2	4	10	9
TOTAL	24	1	7	4	31	5

UNCOVERED

1st	5	4	2	14	8	12
2nd	5	0	1	8	6	8
3rd	3	14	1	11	5	9
4th	6	6	0	12	7	2
TOTAL	20	8	6	13	27	5

Table II shows the weight of fruit from covered and uncovered plants.