

PEST AND DISEASE CONTROL COMMITTEES – THE FIRST YEAR OF OPERATION

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Abstract

The decision by the South African Sugar Association to introduce regulations for the control of pests and diseases in the sugar industry resulted in the formation of Local Pest and Disease Control Committees in each mill area throughout the Republic of South Africa. Pest and Disease Control Officers, employed by the SASA Experiment Station were appointed to serve one or more of these Committees, and through surveys at mills and in the field, to provide information on the incidence of pests and diseases in each mill area. Procedures initiated during the 1982/83 season to control pests and diseases and some of the problems which were encountered, are discussed.

Introduction

In January 1982, the South African Sugar Association decided that a Local Pest and Disease Control Committee should be formed in each mill area throughout the South African sugar industry. This was achieved in June the following year when the members of the Committee in the Empangeni mill area were appointed.

The regulations to control pests and diseases in the South African sugar industry and the procedures for the appointment, regulation and method of operation of Local Pest and Disease Control Committees and officers have been described by Thompson *et al.*. Prior to the formation of these Committees, Eldana Committees had been set up by growers in the Amatikulu, Darnall and Maidstone mill areas to combat the increasing threat of the sugarcane borer *Eldana saccharina* to their crops. The first meeting was held in the Amatikulu area in June 1979. Codes of conduct or Codes of Practice were drawn up by these Committees once growers had agreed on the measures necessary to contend with eldana.

Procedures

Five Pest and Disease Control Officers were appointed to the Extension Division of the Experiment Station in January 1982 and after intensive training they were posted to their areas in March 1982. Three disease Inspectors, previously members of the Experiment Station's Pathology department, were transferred to the Extension Division to become Pest and Disease Control Officers, one of whom was responsible for the administration of disease control regulations in Swaziland. Attempts were made to provide the Pest and Disease staff with offices adjoining those of local Extension Officers so that they could benefit from the experience and knowledge and share the secretarial services of the latter.

In December 1981 the South African Sugar Association appointed a Pest and Disease Control Steering Committee whose members were growers, miller representatives and staff of the Experiment Station. The terms of reference of this Committee were to:

- assist with the establishment of Local Pest and Disease Control Committees
- devise a set of guidelines to enable local Committees to operate on as uniform a basis as possible
- monitor the activities of local Committees

- advise and make recommendations periodically to the Council of the SA Sugar Association, on the subject of pest and disease control.

The Steering Committee met with all Local Pest and Disease Control Committees during January and February 1982, when the draft regulations and method of operation of Committees was discussed. As a result of these discussions, the proposed regulations and methods of operation were amended.

In the discussions with the Secretary of the KwaZulu Department of Agriculture and Forestry and officials of the KwaZulu Cane Growers' Association, the Steering Committee was informed that the KwaZulu Legislative Assembly had certain autonomous powers conferred on it by the South African government and with regard to agricultural matters, it was completely independent from the Republic of South Africa. The rules and regulations for the control of pests and diseases would therefore have to be approved by the KwaZulu Legislative Assembly. Provision has been made for representatives of Black cane growers to be appointed to Local Pest and Disease Control Committees.

In accordance with the regulations, the Experiment Station advised the South African Sugar Association of the varieties which should be grown in mill areas throughout the industry.

The Committees in Operation

The appointment, regulations and method of operation of Local Pest and Disease Control Committees and officers in terms of clause 68 of the Sugar Industry Agreement provides the *modus operandi* for the Committees.

Committee members were appointed to represent mill groups and were chosen so that areas having different climates and different disease potential were taken into account. Members of the Indian and Black cane growing communities are all represented on committees where the amount of cane produced by the community warrants it; otherwise the members are co-opted. The names of the Committee members in each area were circulated to growers in a newsletter in which they were also informed of the Committee's general objectives, the immediate programme and the functions of the local survey teams.

The responsibility for the control of pests and diseases and the use of good quality seedcane, has made it necessary for Committees to establish priorities which are determined by the available resources and the necessity for and practicality of implementing control measures. In areas where eldana has been a problem for many years, or where smut or mosaic were known to be a threat to the sugarcane crop, it was not difficult to establish priorities. However, in areas where there were low levels of pests or diseases, decisions on the appropriate course of action were made only after considerable discussion.

Field surveys were often necessary so that levels of pests and diseases could be established before priorities could be determined.

How the Committees operate and the methods that are employed for the control of each pest or disease are outlined in the sections which follow.

Eldana

The present recommendations of the Experiment Station for the control of eldana borer concern the reduction of the age at which cane is cut. Survey data continue to show that the incidence of eldana and consequent damage to the crop, increase with the age of the cane. The optimum age at which to cut cane for the control of eldana appears to be between 14 and 16 months. In areas where the control of eldana is most important, the Committees are attempting to establish the age at which cane in a particular area and on particular farms, is harvested, and then to persuade growers to harvest their cane at the optimum age, thereby reducing the size of the crop carried over from one year to the next.

A procedure which was developed by the Darnall Local Pest and Disease Control Committee has been adopted and modified where necessary by other Committees in areas where eldana is a problem. The procedure is illustrated in Figure 1.

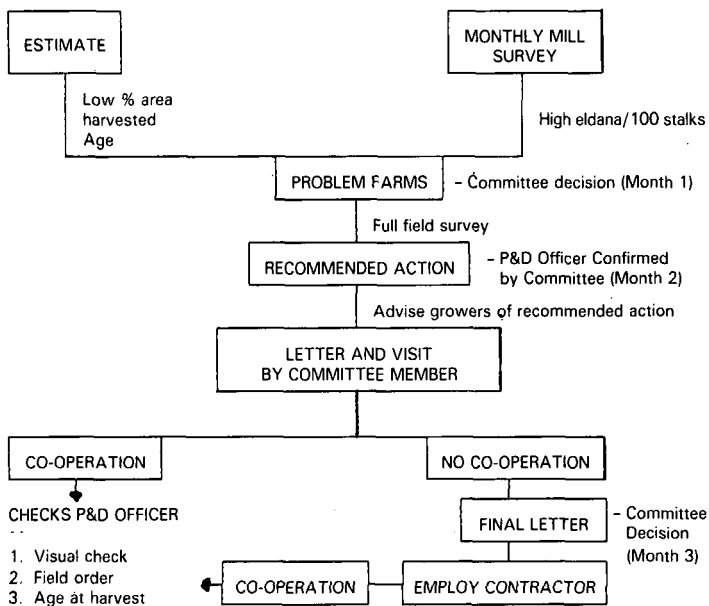


FIGURE 1 Procedures for the control of eldana

With the co-operation of the local Mill Group Board, estimates of areas to be cut in any one season and mill and field survey results are examined. A 'problem farm' is identified by the combination of a low percentage of cane to be cut compared with the total area under cane, and a high incidence of eldana. This is followed by a survey of the entire farm, carried out under the supervision of the Pest and Disease Officer. If an unsatisfactory situation is confirmed, the Committee consults the grower and a course of action is recommended. If necessary, additional deliveries of cane are arranged through the Mill Group Board. This system appears to be working well and has resulted in significant improvements on farms which could have a source of eldana. Continued publicity and encouragement by Committees has resulted in co-operation from growers and throughout the eldana infested areas there has been a reduction in the average age at which cane is harvested. This is illustrated by the situation in the Amatikulu area, excluding Melmoth (see Table 1), where an estimated 84% of the area under cane was harvested in the 1981/82 season. Recommendations for the maximum age of cane at which it is harvested have been made for different climatic areas.

There was a considerable reduction in the level of eldana infestations throughout the industry when the percentage of the area that was harvested was increased from 55% in 1980/81 to 67% in 1981/82. Levels did however increase again in November and December 1982 after the drought during winter and spring. It is unfortunate that the efforts of growers to harvest their cane at a younger age have, to some extent been

TABLE 1

Age of cane at the time of harvest in the Amatikulu area, 1974/75 to 1981/82

Season	Estimated average age (months)
1974/75	20,2
1975/76	20,3
1976/77	17,3
1977/78	17,9
1978/79	21,4*
1979/80	19,4
1980/81	20,0
1981/82	14,3

* Year of restricted production

nullified by droughts or periods of restriction during the past six years. Nevertheless, by reducing the harvesting age, the industry has become aware of the unnecessarily high average age at which cane is generally cut in the rainfed areas. Many growers are now convinced that good yields and profits can be attained by reducing the age of their cane at the time of harvesting, and this has been to the benefit of the whole industry.

Another example of the action of the Committees to control eldana is the prompt negotiation the Umzimkulu Committee conducted with a group of ten growers in the St Michael's area on the South Coast, early in 1981, when eldana was first identified in that area. From this isolated nucleus of infestation the pest could have spread to other parts of the cane growing area. After discussions with their Committee, the growers agreed to cut all their cane during the 1981/82 season. Early in 1981, the Tongaat Committee arranged extra allocations of cane for all the coastal growers, while the growers in the high-altitude areas, where eldana is not a problem, gave up their allocations for a period early in the season.

There are instances where growers responded to the requests of Committees to cut more cane than they intended, but still had fields in which eldana numbers exceeded the hazard level set by the local Committee. It was recommended that these crops be pretrashed as soon as possible and harvested early in the following season.

As long as the recommendation for the control of eldana is that the age of the cane at the time of harvest be reduced, it is unlikely that the Committees' approach will change from the above-mentioned procedure. There has been some emphasis on avoiding varieties which are particularly susceptible to eldana attack unless they can be cut on an annual cycle. Stressed cane is more susceptible than unstressed cane to attack by the borer; therefore irrigation of the crop in areas where eldana is a problem has been encouraged. The Amatikulu Committee is attempting to increase the amount of irrigated cane in their area, both to avoid stress and to reduce even further the age at which cane can be cut.

Smut

The menace of smut in the northern irrigated areas, the Umfolozi area and to a lesser extent the coastal areas of Zululand and Natal is a cause of concern to the respective Pest and Disease Control Committees. Control in the long term will be achieved by substituting the more resistant varieties, such as J59/3, N11, N52/219 and lately N14 and N15, for the more susceptible varieties, such as NCo 310, N55/805 and even NCo 376. In the short term, in order to maintain present yields and to reduce the smut spore load, rigorous and continuous roguing of smut-infected stools is recommended.

Because yields of cane are not seriously affected by smut until the incidence of the disease is high, the reaction from growers in some areas has been slow and in some instances, the disease is out of control. There is no doubt that the useful life of variety NCo 376 has been reduced as a result. In Zimbabwe and in the northern area of Swaziland, smut has been kept below a

level of 5% infected stools, by a response of the whole community to a call to practise good field hygiene. In areas such as Komatipoort in the Eastern Transvaal, where a survey in November 1981 showed that 17% of the stools were infected, roguing is less effective. The local Committee has concentrated on the introduction and promotion of newer and more resistant varieties and already the area under NCo 376 has been reduced to 70%.

The course of action of Control Committees in areas badly affected by smut is similar to that shown diagrammatically for the control of eldana. Problem farms and fields are identified by field surveys. The general level of the disease in the whole area, or parts of an area, provides the Local Committee with some guidance in setting levels at which roguing or ploughing-out should occur. Where levels of infection constitute a menace to the community, growers are warned that if levels of infection in the following ratoon are still unacceptable, a plough out of the crop could be demanded.

The new variety N14 is being relied on as a variety which has a good yield potential and less susceptible to smut than NCo 376. The Lowveld (Eastern Transvaal) Committee is concentrating on inspecting seedcane, particularly of the new varieties, and strongly recommends that any seedcane which does not meet the required standard is not used for planting. All bulking-up plots of N15 were on virgin land so that any possible contamination with smut-infected volunteers could be avoided. Field surveys carried out during the summer of 1983 will provide the course of action for the remainder of the year.

In Pongola, the Local Pest and Disease Control Committee has given growers until May 1983 to plough-out all remaining fields of NCo 310. All other fields in which more than 12% of the stools are infected should be ploughed out. The critical level will be adjusted after the 1983 field surveys and it is hoped that it will eventually be reduced to a 5% level of infection. Growers have been asked to plant N52/219, N11, N14 and J59/3. All seedcane for sale has to be inspected by the Pest and Disease Officer, and if it is not up to standard it may not be sold. The release of the new variety N15 has been restricted to four additional co-operators in the area until more information concerning its resistance to smut becomes available.

In the Umfolozi area smut could be a serious problem if it were not for the efforts of Extension Officers prior to the appointment of a Control Committee, and the very positive attitude of the present Committee. Growers are aware of the situation and are responding well to the Committee's efforts. Those growers whose cane had an infection level of more than 10% have been visited by the Chairman of the Local Pest and Disease Control Committee and the Pest and Disease Officer; the problem and necessary action have been discussed. The Committee has arranged demonstrations on how volunteers can be eradicated; surveys on the effectiveness of roguing were carried out and much progress has been made in the provision of good quality seedcane (see under Seedcane and Varieties) and the elimination of smut-susceptible varieties. Sixty percent of the Monzi area is under NCo 310 which is susceptible to smut.

Further south in the Empangeni, Felixton and Amatikulu areas, field surveys show a wide distribution of smut but generally at low levels. The Committees here are encouraging roguing and the introduction of resistant varieties. Where levels of smut are high, growers are being warned of the possibility of having to plough the crop out if surveys do not show an improvement in the situation.

Mosaic

Mosaic is generally confined to the cooler, higher altitude areas of the sugar industry. Infection is particularly severe in the Dumisa, Mid-Illovo, Eston, Cramond and Melmoth areas.

The disease is widespread in other areas but occurs at low levels.

Control measures are similar to those recommended for smut and include roguing which is a short term policy but in the long term, replacing susceptible varieties with less susceptible ones is the only solution. A degree of control is also obtained by planting susceptible varieties before November so that the crop is not young when the insect vector is most active. The effects of roguing are less rewarding than they are with smut so replacement with more resistant varieties needs to be emphasised.

Fewer field surveys have been done in mosaic-prone areas than in the smut-affected areas to the north. Hence Committees in the areas where mosaic is a problem, will need more time to assess the situation, but the resulting action will be similar to that taken for smut. Once the general level of infection in a mill area has been determined, critical levels can be set an above these ploughing-out will be recommended. At low levels of infection, roguing of infected stools can help to contain the situation.

During the past year Committees have concentrated on making their growers aware of the dangers of mosaic. This has been done through newsletters and meetings of the local Committee and members of the Experiment Station Pathology and Agronomy departments. Members of Committees have requested more information on the nature of the disease and methods of control.

The Sezela Committee arranged for cane from the mosaic-affected area to be taken to the mill early in the season so that the succeeding ratoon would not be young and susceptible in summer when the insect vector became active. Experiments have shown that if cane is planted before November, the level of mosaic in the plant crop is reduced and it is assumed that the same would apply to ratooning crops. This Committee therefore arranged through the Farmers' Associations and the Mill Group Board, to harvest early in the season, an extra 120 000 tons of cane from 12 farms in the Dumisa area. Despite delays at the Sezela mill all the growers had completed their deliveries and their planting by 10 December.

In the Illovo mill area, a comprehensive programme in which procedures and objectives for the long term control of mosaic are set out, has been drawn up and accepted by the local Committee. The Committee members have visited badly infected farms to familiarise themselves with the problem.

The many field surveys being carried out in mosaic-affected areas will provide more information concerning the disease in commercial fields; levels of infection appear to be highest in plant cane and early ratoons. Growers are not convinced that mosaic affects crop yields significantly, thus there is little incentive to implement control measures.

Ratoon Stunting Disease

Although Pest and Disease Control Committees know that Ratoon Stunting Disease (RSD) can affect crop yields more than any other disease, it has understandably been given a low priority while smut, mosaic and eldana are prevalent. RSD cannot be transferred from one farm to another except in seedcane and to promote the distribution of disease-free seedcane, the Committees have encouraged growers to make use of hot water treatment (HWT).

Seedcane and varieties

Committees have been emphasising the fact that the control of diseases in sugarcane depends to a large extent on good quality seedcane of varieties that are acceptably resistant to prevalent diseases. In some mill areas, there is a tendency towards centralising seedcane nurseries, sometimes in co-operation with the miller-cum-planter.

At Pongola, the miller for a number of years has provided certified seedcane to the grower and each year 2 500 tons of seedcane of recommended varieties are being sold. Approximately 2 000 tons of this is the new variety N14, which shows good resistance to smut.

In the Umfolozi area, centralised nurseries have been established by the Local Pest and Disease Control Committee in conjunction with the mill. All seedcane going into these nurseries is treated in hot water containing Bayleton. During the 1982/83 planting season 6 000 tons of high quality seedcane is expected to be sold, which includes 1 200 tons of N14. Approximately 1 600 tons of this variety will be planted during the 1982/83 season; this includes the seedcane from co-operators' bulking-up plots.

The Amatikulu Local Pest and Disease Control Committee is assisting in establishing a centralised nursery under irrigation for the Emoyeni growers. Discussions between the Gledhow, Darnall and Tongaat Committees are in progress so that a common policy regarding seedcane production can be established.

On the South Coast, the miller at Illovo is planting 19 ha of N12 to provide seedcane to Illovo growers. In the Tala Valley, the Extension Officer suggested to a group of growers that they combine their allocations of N16 and plant it in a centralised nursery. At Sezela and Umzimkulu, the miller is investigating the possibility of increasing the area of nurseries so that growers can be provided with good seed.

In all mill areas, the Local Pest and Disease Control Committees offer an inspection service to growers so that seedcane from their own nurseries can be examined and certified. These are often the continuation of seedcane improvement schemes started by Extension Officers before Local Pest and Disease Control Committees were appointed. The developments have been encouraging and grower interest in new and more disease-resistant varieties is increasing.

Growers are understandably reluctant to replant large areas to a variety that has not already been proved in the area under commercial conditions, even if it is more resistant to disease than other varieties. The Experiment Station realises the need to provide growers with more information on new varieties. The Pest and Disease Committees and Extension Officers will ensure that the new varieties are assessed against a standard variety during the bulking-up stage on co-operators' farms and in the field under commercial conditions.

Survey teams and reports

The decisions made by the Committees are based mainly on information obtained from field surveys, which are carried out by teams consisting of a supervisor and five inspectors. Eldana surveys are carried out at all the mills and the teams are controlled and supervised by the resident technologist of the Central Board.

The field survey teams are controlled by the Pest and Disease Officers who carry out spot checks on the activities of the teams but much of the responsibility for the reliability of the surveys rests with the team supervisors. Every effort is made to maintain high standards of inspection and growers are asked for their comments on the performance of these survey teams. Regular refresher courses will be conducted for team supervisors.

The Experiment Station is responsible for the technical performance of mill survey teams and they are therefore visited regularly by the Pest and Disease Control Officers. In some instances, this has been done by Local Pest and Disease Control Committee members.

There are 17 survey teams operating regularly throughout the sugar industry and the amount of information on pests and diseases has increased significantly. Pest and Disease Control Officers submit monthly reports to the Experiment Station and to their Committees. A detailed disease report is submitted to the Experiment Station in July and December each year. Regular newsletters from the Committees are distributed to growers in each mill area, giving information on the distribution and levels of pests and diseases and recommended methods of control.

Black cane growers

Smut, mosaic and eldana are prevalent in cane grown by Black growers. Their cane is inspected for eldana at the mill, but very few surveys have been carried out in their fields to establish the incidence of diseases.

The assessment of the pest and disease situation in Black growers' cane is difficult because they are in KwaZulu, and it involves inspecting many small fields. The Committees will therefore have to rely on information provided by the KwaZulu Department of Agriculture and Forestry. The Pest and Disease Officer, assisted by Extension Officers, the Experiment Station and miller-cum-planters will have to provide the necessary training for KwaZulu staff.

It is likely that yields are being reduced by Ratoon Stunting Disease; therefore the Black growers should be provided with good quality seedcane and this is being considered by millers, the KwaZulu Department of Agriculture and the Experiment Station.

Conclusion

During the initial period of operation, Local Pest and Disease Control Committees attempted to assess the problems of the areas for which they are responsible and growers have been made aware of the Committees' existence, objectives and authority. Extension Officers have done much to help the Pest and Disease Control Officers establish themselves in their areas and in carrying out their duties. Pest and Disease Officers and the supervising staff of the Extension Division meet regularly to discuss problems.

Much has been achieved in a short period of time without regulatory legislation. Chairmen and the members of the Committees have accepted their responsibilities and the measure of their success will eventually be the extent to which pest and disease problems are overcome.

The surveys have indicated that the distribution of pests and diseases is far wider than was thought when the decision to introduce regulations was made. Increasing production costs and the present low price of sugar make it even more important for yields not to be reduced by pests and diseases.

REFERENCE

1. Thompson, G. D., Foss, R. G. and Paxton, R. H. (1983). The introduction of pest and disease control regulations into the South African sugar industry. *ISSCT Proc 18* (in press).