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SOUTH AFRICAN SUGAR ASSOCIATION

EXPERIMENT STATION

GUIDELINES FOR CONDUCTING TRIALS  
WITH INSECTICIDES TO CONTROL ELDANA




INTRODUCTION

1. The commercial companies supplying agricultural chemicals to the South African sugarcane grower and the Experiment Station have much common ground.
2. We know that there is a lot to be gained by the industry if we co-operate with companies whose products can be useful in sugarcane agriculture. The Station has a long history of successful co-operation in the field of herbicides, but the small demand for insecticides in the past has limited our involvement with the suppliers of these chemicals.
3. The problem being experienced with eldana in the industry necessitated the introduction of an insecticide research programme. Since 1980 one entomologist has devoted his attention to insecticides alone. Little progress was made until the synthetic pyrethroids became available for testing, and we now regard the prospects to be reasonably promising.
4. Whilst evaluating insecticides to control eldana is a significant part of our research programme, we are heavily committed also to a study of biological control. We have demonstrated that by cutting cane at as young an age as possible, by pre-trashing cane that will be more than 12 months old when harvested, and by irrigating as much of the crop as possible, eldana numbers can be reduced significantly. Our view is that safe insecticides may well become part of an integrated system of eldana control.
5. We believe that the chemical suppliers and ourselves have a responsibility not only to identify effective chemicals, but to ensure that candidate insecticides do not harm beneficial insects and do not endanger the local environment.
6. For an insecticide to be registered and therefore to be marketable for a prescribed purpose, the authority of the Technical Adviser in the Department of Agriculture has to be obtained. Although the Adviser makes an independent decision, it is his stated intention to refer all applications concerned with chemicals for sugarcane to the Experiment Station.
7. For this reason, if for no other, we believe that the methods of assessment used by everyone involved, including ourselves, should be as consistent as possible.

REQUIREMENTS

8. By the time that registration is requested, the programme of assessment should have included:
  - . at least four replicated plot trials
  - . four field scale trials (minimum area 2 hectares)

- 
9. Replicated plot trials are intended to evaluate candidate chemicals in comparison with an acceptable standard treatment, and should comprise six replications.
  10. Field scale trials are intended to demonstrate that an effective chemical can perform its required task on a commercial scale.

#### DESIGN OF EXPERIMENTS

11. Replicated plot trials should include:
  - . control plots
  - . the standard insecticide treatment currently recommended or suggested by the Experiment Station
  - . the candidate remedy at the proposed application rate
  - . the candidate remedy at the proposed application rate plus 50%
  - . the candidate remedy at the proposed application rate less 50%.
12. Replicated plot size should be a minimum of 7 rows x 15 m all of which should be treated. Assessments of treatment effects should be made in the central 5 rows x 13 m (net plot).
13. Field scale trials should involve approximately 80% of the field being treated with the candidate remedy at the proposed application rate and the remaining 20% of the field should be similar to the treated part, but remains untreated.

#### ASSESSMENT OF FIELD TRIALS

14. Replicated plot trials in young ratoons should provide the following data:
  - . the number of dead shoots in each net plot 4-6 weeks after treatment
  - . the number of live shoots in 5 x 3 m lengths of row in each net plot 4-6 weeks after treatment.
15. Field scale trials in young ratoon cane should provide the following data:
  - . the number of dead shoots in 5 x 30 m of row in each treatment 4-6 weeks after treatment
  - . the number of live shoots in 5 x 10 m of row in each treatment 4-6 weeks after treatment
  - . the number of stalks in 5 x 10 m of each treatment shortly before harvest
  - . the number of eldana larvae, pupae and borer-damaged stalks in a 300 stalk sample from each treatment shortly before harvest. The number of *Sesamia* larvae and pupae should also be recorded. (If possible, 500 stalks should be sampled).

16. Replicated plot trials in standing cane should provide the number of eldana larvae, pupae and borer-damaged stalks in a 100 stalk/net plot sample. The number of *Sesamia* larvae and pupae should also be recorded. The number and frequency of assessments will depend on the effect of the treatments.
17. Field scale trials in standing cane should provide the number of eldana larvae, pupae and borer damaged stalks in a 300 stalk sample/treatment. The number of *Sesamia* larvae and pupae should also be recorded. The number and frequency of assessments will depend on the effect of the treatments.
18. An assessment of insecticides on plant cane by dipping of setts should include at least four replicated plot trials (six replications). Each trial should include:
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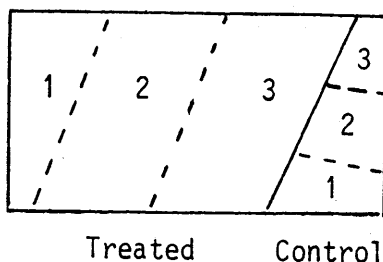
The treated cane should be planted in plots measuring at least 7 rows x 15 m. Assessment of treatment effects should be made 8-10 weeks after planting by counting the number of dead shoots in the central 5 rows x 13 m (net plot), and by counting the number of live shoots in 5 x 3 m lengths of row.

#### GENERAL

19. Application rates and methods and the type of equipment used should be recorded, as should other relevant data such as crop growth stage, phytotoxicity and climatic conditions before, during and after treatment. Details on assessment methods, particularly in the case of field scale trials, should be recorded in relation to the size and shape of the field treated.

#### SAMPLING PROCEDURES

20. In replicated plot trials, 20 stalks should be removed from each of the five net plot rows to provide the 100 stalk sample.
21. In field scale trials, the treated area should be split into three roughly similar areas (1, 2 and 3 in the diagram) as should the untreated area as shown in the following example:



One hundred stalks should then be removed from each of the three treated areas and a further 100 stalks removed from each of the untreated areas. This helps to ensure that the stalks are representative, in terms of eldana, of the area they come from.

ELDANA COUNTS

22. After the stalks have been removed from the trial plots they should be topped and then split longitudinally into four quarters. The number of eldana larvae and pupae, borer damaged stalks and *Sesamia* should then be recorded.

GDT/MG  
22 February, 1984

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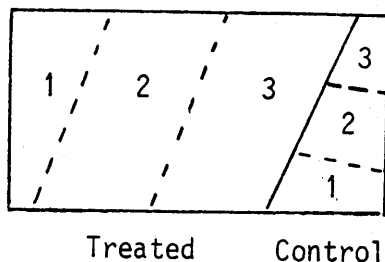
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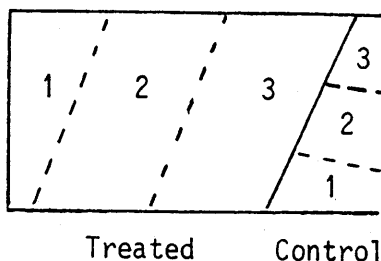
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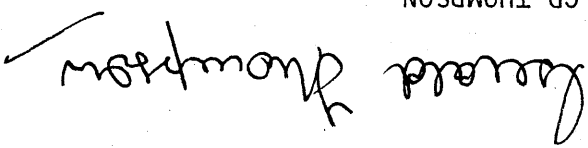
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GDT/MG  
22 February, 1984

ENCL :

DIRECTOR  
GD THOMPSON



Yours sincerely,

Kind regards,

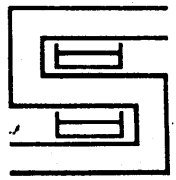
As you probably know, there is a spate of interest being shown in insecticides by growers who are badly affected by eldana. We have prepared the document enclosed herewith in the hope that, should your organization conduct any trial work on eldana, you will be able to follow the same procedures that we will be adopting in our own work.

Dear Sirs,

Attention : Dr J Bot

Plant Protection Research  
Private Bag X134  
PRETORIA  
0001

**South African Sugar Association Experiment Station**  
P.O. Mount Edgecombe, 4300, Republic of South Africa



Telephone Durban 591805  
Telegrams "SASEX" Mt. Edgecombe  
Telex 6-23020 SA  
All communications to be  
addressed to the Director  
Your Ref.  
Our Ref.

GDT/MG/3.2.2

27 February, 1984