

GUIDELINES FOR GROWTH REGULATOR REGISTRATION TRIALS :

SMALL GRAINS

Issued by the Registrar : Act 36 of 1947 - Department of Agriculture. Compiled by the Department in consultation with the Agricultural and Veterinary Chemicals Association of South Africa.

INDEX

	<u>PAGE</u>
1. INTRODUCTION	1
2. GENERAL TRIAL REQUIREMENTS	2
3. EFFICACY TRIALS	2
4. COMPATABILITY TRIALS	3
5. PHYTOTOXICITY TRIALS	3
6. RESIDUES	4

GUIDELINES FOR GROWTH REGULATOR REGISTRATION TRIALS :
SMALL GRAINS

1. INTRODUCTION

- 1.1 The purpose of these guidelines is to obtain greater uniformity in registration trials on small grains. This summary serves only as a guide to such trials.
- 1.2 These guidelines do not replace the requirements set out in Act 36/1947 and the regulations promulgated thereunder but are only complementary to the above.
- 1.3 Experimentation with a view to obtaining registration of an agricultural remedy must be discussed in advance with the Technical Advisor (Herbicides), Act 36/1947 of the Department of Agriculture and Water Supply, the Research Institute for Grain Crops and/or regions. The Department should where possible be provided with a plan of each trial and a proposed list of treatments prior to commencement of the trials.
- 1.4 It is recommended that the Department of Agriculture be kept informed of the progress of the experiments at all times prior to submission for registration. Trial sites must be available for inspection by officers of the Department.
- 1.5 Residue trials must be undertaken according to the requirements set out in the circular letter X17/A of the Registrar (Act 36/1947), dated 8 January 1982. Withholding periods, especially for pastures, are important.
- 1.6 The results must, where necessary, be analysed statistically. It is recommended that the percentage system be used to rate growth and crop damage (phytotoxicity).
- 1.7 If required by the Small Grain Centre and/or region, a sample of the candidate growth regulator must be submitted to them for evaluation in their own phytotoxicity and efficacy studies. The sample must be submitted well in advance of the commencement of the planting season.

These trials will serve merely to back up and not to replace the data produced by the applicant.

2. GENERAL TRIAL REQUIREMENTS

- 2.1 At least four replicated efficacy trials in different regions will be required. The actual number of trials however shall be determined during the initial discussions with the Department.
- 2.2 The candidate growth regulator will only be considered for registration on those recommended small grain cultivars which have been included in efficacy and phytotoxicity trials. See the National Cultivar Recommendation list (obtainable from the Small Grain Centre) for a specific area, planting time, plant density and fertilisation.
- 2.3 Conditions during application such as soil moisture (estimated), growth stage of crop and weeds, physiological condition of plants and weeds, cloud cover, wet and dry bulb temperatures, occurrence of dew, etc. must be recorded.
- 2.4 Details must also be furnished concerning spraying equipment, e.g. type of equipment, spray nozzle, pressure and the amount of diluted spray mixture applied per hectare.
- 2.5 Trials should be conducted over two seasons in different bioclimatic regions and on a range of different soil types.

3. EFFICACY TRIALS

- 3.1 Plot size 20 sq m.
- 3.2 Replicates 4-6.
- 3.3 Separate control plots as well as control plots alongside each plot as in the case of herbicides.
- 3.4 Maintenance - control weeds pests and diseases. If control of diseases or an effect on diseases is anticipated specific separate efficacy trials should be conducted for that purpose.
- 3.5 Conduct ground and aerial efficacy trials. Aerial trials based on 3 swaths/treatment. (Evaluate in the centre of the central swath). Aerial trials are considered as demonstrations to prove the product can be applied by air.
- 3.6 Range of dosage rates - various timings 1 & 2 sprays etc. should be included.

3.7 Evaluation

- * Visual and non visual effects on a measured basis.
 - Ear size
 - Ears/plant
 - Plant height
 - Internode length
 - Yield
 - Plants/sq m
 - Grain quality (Hectolitre Mass)
 - Leaf discolouration
- * Effect on disease in separate trials aimed at disease only.
- * Lodging as a % based on a visual evaluation.

4. COMPATIBILITY TRIALS

To determine whether the chemical can be mixed with other pesticides.

5. PHYTOTOXICITY TRIALS

1. Plots 20 sq m or 10 sq m if self sown.
2. Single and double rate in a programme of sprays if the product is to be recommended in a programme.
3. Maintain weed, disease and pest free.
4. Evaluate
 - a) In season of application
 - * Visible - crop damage
 - malformations
 - discolouration etc.
 - * Yield (grain mass/ha)
 - * Grain quality (Hectolitre Mass)
 - b) In follow up season effects on follow up crops as there may be soil residual carryover, i.e. Establish follow up crop withholding period.

6. RESIDUES

1. Evaluate from ground sprayed trials only.
2. Use single and double anticipated dosage rate in a programme as is to be applied in practise.
3. Sample crop i.e. grain and foliage.
Samples at 0,1,2,4,8,16,32,64 DAT.

Short residual Min 3 samples.
Medium residual Min 4 samples.
Long residual Min 5 samples.

GUIDELINES FOR HERBICIDE REGISTRATION TRIALS:

SMALL GRAINS AND PASTURES

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INDEX

	<u>PAGE</u>
1. INTRODUCTION	1
2. GENERAL TRIAL REQUIREMENTS	1
3. HERBICIDE EFFICACY TRIALS	2
4. HERBICIDE PHYTOTOXICITY TRIALS	3

1.

GUIDELINES FOR HERBICIDE REGISTRATION TRIALS :
SMALL GRAINS AND PASTURES

1. INTRODUCTION

- 1.1 The purpose of these guidelines is to obtain greater uniformity in registration trials on small grains. This exposition serves only as a guide to such trials.
- 1.2 These guidelines do not replace the requirements set out in Act 36/1947 and the regulations promulgated thereunder but are only complementary to the above.
- 1.3 Experimentation with a view to obtaining registration of an agricultural remedy must be discussed in advance with the Technical Advisor (Herbicides), Act 36/1947 of the Department of Agricultural Development, the Research Institute for Grain Crops and/or regions. The Department should where possible be provided with a plan of each trial and a proposed list of treatments prior to commencement of the trials.
- 1.4 It is recommended that the Small Grain Centre be kept informed of the progress of the experiments at all times prior to submission for registration. Trial sites must be available for inspection by officers of the Small Grain Centre.
- 1.5 Residue trials must be undertaken according to the requirements set out in the circular letter X17/A of the Registrar (Act 36/1947), dated 8 January 1982. Withholding periods especially for pastures are of utmost importance.
- * 1.6 The results should, where necessary, be analyzed statistically. It is recommended that the percentage system be used to rate weed control and phytotoxicity. Yield trials should also be carried out.
- 1.7 Herbicide formulations, herbicide tank mixtures and the addition of adjuvants require registration.
- 1.8 If required by the Small Grain Centre and/or region, a sample of the candidate herbicide must be submitted to them for evaluation in their own phytotoxicity and efficacy studies. The sample must be submitted well in advance of the commencement of the planting season. These trials will serve merely to back up and not to replace the data produced by the applicant.

2. GENERAL TRIAL REQUIREMENTS

- 2.1 At least four replicated trials in different regions will be required. The actual number of trials however shall be determined during the initial discussions with the Department.

- 2.2 The candidate herbicides will be considered for registration only on those recommended small grain cultivars on which it has been tested. See the National Cultivar Guidelines list (obtainable from the Small Grain Centre) for a specific area, planting time, plant density and fertilization.
- 2.3 Conditions during application such as soil moisture (estimated), growth stage of crop and weeds, physiological condition of plants and weeds, cloud cover, wet and dry bulb temperatures, occurrence of dew, etc. must be recorded.
- 2.4 Details must also be furnished concerning spraying equipment, for example, type of equipment, spray nozzle, pressure and the amount of diluted spray mixture applied per hectare.
- 2.5 Trials should be conducted over at least two seasons in different bioclimatic regions and on a range of different soil types. For soil active herbicides the soil from each site must be analyzed (pH, clay content, soil type classification and organic material content).

3. HERBICIDE EFFICACY TRIALS

- 3.1 Trials should be established to cover as wide a range of weeds as possible.
- 3.2 Treatments must be replicated at least four times.
- 3.3 The area of each plot must be at least 10 square metres.
- * 3.4 Each plot must have an adjacent untreated control area which can be used for weed control evaluation.
- 3.5 In the case of a postemergence treatment weed size or biomass or percentage ground cover of each weed species must be noted before application of the herbicide treatment. After application the site must be visited at regular intervals and the percentage weed kill or retardation as well as the spectrum controlled must be noted.
- 3.6 A range of application rates should be evaluated in order to determine the most suitable rate.
- 3.7 Where applicable different application techniques, for example aerial application, tractor application, etc. must be evaluated. In the case of pre-emergence herbicides which have to be incorporated into the soil, the various implements (discs, cultivator, harrow, etc.) as well as planting methods must be evaluated in order to determine if these have any effect on the efficacy of the treatment.
- 3.8 If the clay percentage, soil moisture, organic material content, etc. are deemed to be of importance regarding dosage and residual effect, trials must be carried out to illustrate these characteristics of the herbicide.

- 3.9 To claim residual weed control with a herbicide, trials must illustrate these properties and factors (pH, clay content etc.) which may influence the residual effect of the treatment.
4. Herbicides will only be registered in combination with other chemicals if trials have been carried out in this regard.

4. HERBICIDE PHYTOTOXICITY TRIALS

- 4.1 The plot size must be at least 10 square metres.
 - 4.1.1 Treatments must be replicated at least four times.
- 4.2 The herbicide must be evaluated at the proposed recommended application rate and twice the recommended application rate on all the applicable cultivars.
- 4.3 Visible phytotoxicity if any must be evaluated at regular intervals commencing two weeks after application and continuing throughout the growing period of the crop.
- 4.4 Yield (hectolitre mass or plump kernel percentage and grain mass/ha) must be calculated and the baking quality of wheat and the malting quality of barley should be determined.
- 4.5 The plots should be sited on weed free areas. If this is impossible then regular hand weeding or careful mechanical weeding may be called for.
- 4.6 Crop safety at twice the recommended rate on the most important follow up crops must be evaluated with herbicides which have residual weed control properties.
- 4.7 Herbicides such as bromoxynil should preferably not be registered with herbicides containing adjuvants.

GUIDELINES FOR INSECTICIDE REGISTRATION TRIALS :

SMALL GRAINS AND PASTURES

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INDEX

	<u>PAGE</u>
1. INTRODUCTION	1
2. COMMON FACTORS - SMALL PLOT TRIALS	2
3. COMMON FACTORS - AERIAL TRIALS	2
4. ASSESSMENT METHODS - CEREALS	2
a) APHIDS	2
b) AMERICAN BOLLWORM WHEAT SLUG	3
d) GRAIN CHINCH BUG FALSE CHINCH BUG	3
5. ASSESSMENT METHODS - PASTURES	3
a) RED LEGGED EARTH MITE EARTH FLEA FLEA BEETLES APHIDS	3
b) AMERICAN BOLLWORM LUCERNE CATERPILLAR	3
c) WHITE FRINGED BEETLE	3

1.

GUIDELINES FOR INSECTICIDE REGISTRATION TRIALS :
SMALL GRAINS AND PASTURES.

1. INTRODUCTION

a) General

The following information must be supplied:-

- *Cultivar.
- *Locality.
- *Farm name.
- *Name of person executing trial.
- *Growth stage at application and evaluation.

- *For cereals the Zadoks scale should be used to describe growth stages.

- *Leaves evaluated are described as flag-leaf (FL)

FL - 1
FL - 2, etc.

Four efficacy trials in different areas over a two-year period (with adequate infestation levels) are required to obtain a registration.

b) Compatibility

The company registering a new product is responsible for the testing of compatibility with its own products and with products already registered by other companies.

c) Phytotoxicity

Requirements are -

- *Minimum plot size 20 square metres.
or 10 square metres if self-sown.

- *4 Replications.

- *Single and double dose should be applied versus untreated control.

- *Baking tests (wheat) and malting tests (barley) to be conducted.

Local advisers should be informed of trials undertaken in the last season prior to registration.

2. COMMON FACTORS - SMALL PLOT TRIALS

- *Randomized block design.
- *Four replications.
- *Minimum plot size 20 square metres.
- *Hollow-cone or flat fan nozzles.
- *300 L water per ha.
- *Assess -pre-spray.
 - within 7 days of application.
 - thereafter at 7 day intervals until control breaks down to determine residual action.

3. COMMON FACTORS - AERIAL TRIALS

- *Simple block design with one replication.
- *Minimum plot size 3 swathes of reasonable length.
- *Assess at intervals as for small plot trials in 5 localities along the length of the middle swathe.
- *Provision should be made for suitable untreated areas adjacent to or within each treated strip. (Plastic sheeting can be placed over an area of \pm 20 square metres and removed after application to serve as an untreated control).

NOTE

In the case of insect pests such as American Bollworm which are common to a number of crops, a product(s) registered on a certain crop can be registered on other crops with only phytotoxicity and residue data.

4. ASSESSMENT METHODS - CEREALS

a) APHIDS

Russian	<u>Diuraphis noxia</u>
Brown ear	<u>Sitobion avena</u>
Wheat	<u>Schizaphis graminum</u>
Grain rose	<u>Metopolophium dirhodum</u>
Oat	<u>Rhopalosiphum padi</u>
Maize	<u>R. maidis</u>

Sample 15 plants at random in the central position of each plot and count the total number of apterous aphids.

For Russian aphid select plants showing signs of infestation.

For brown ear aphid count number of apterous aphids on at least 15 ears per plot.

b) AMERICAN BOLLWORM

Heliothis armigera

WHEAT SLUG

Lema erythrodera

Count number of live larvae on plants in mid. section of each plot.

Count large and small larvae of bollworm separately.
(< 15 mm long = small)

- c) GRAIN CHINCH BUG Macchiademus diploterus
FALSE CHINCH BUG Nysius natalensie

Sample 15 plants at random in each plot and count number of bugs on ears.

5. ASSESSMENT METHODS - PASTURES

- a) RED LEGGED EARTH MITE Halotydeus destructor
EARTH FLEA Sminthuris viridis
FLEA BEETLES Halticinae spp.
APHIDS - Pea Acyrthosiphon pisum
 - Blue alfalfa A. kondoi
 - Yellow clover Therioaphis trifolii

X Make five ^esemi-circular sweeps through the pasture with a 1 litre jug or tin plate. Note the number of insects in the container after each sweep.

- b) AMERICAN BOLLWORM Heliothis armiger
LUCERNE CATERPILLAR Colias electo

Count the number of live larvae in two 1 square metre areas in each plot.

Count large and small larvae separately.
(small larvae < 15 mm length)

- c) WHITE FRINGED BEETLE Graphnognathus leucoloma

Count number of live larvae up to 100 mm depth in two 1 square metre areas per plot.