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GUIDELINES FOR HERBICIDE AND PLANT GROWTH REGULANT REGISTRATION TRIALS:

TOBACCO

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REGISTRATION TRIALS : TOBACCO

1. INTRODUCTION

1.1. The prime requisite for registration is that the product be "suitable and sufficiently effective for the purpose for which it is intended and that it is not contrary to the interest of the public that it be registered" (Section 3(2) Act 36/1947). This exposition serves only as a guide to registration trials.

1.2. Experimentation with a view to obtaining registration of an agricultural remedy must be discussed in advance with the Technical Advisor (Herbicides), as well as with the Tobacco and Cotton Research Institute.

1.3. It is recommended that the Departments 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 Departments.

1.4. As the end product is used for human consumption, residue trials must be undertaken according to the requirements set out in circular letter X17/A of the Registrar (Act 36/1947) dated 8 January 1982.

1.5. Experimental work should be conducted on a sound biometrical basis, so that the results can be subjected to statistical analysis. The design will depend on circumstances and will range from a simple analysis of variance, to complex factorial designs. The minimum plot size required is a nett plot of 25 m^2.

1.6. Herbicide formulations, herbicide tank mixtures and the addition of adjuvants require registration.

1.7. If required by the Tobacco and Cotton Research Institute, a sample of the candidate herbicide or growth regulant 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 i.e., not later than 20 August. These trials will serve merely to back up and not to replace the data produced by the applicant.

1.8. Overseas data are generally not acceptable although it may be submitted in support of the application for registration.

2. TRIAL REQUIREMENTS

2.1. Experimental data in support of claims made in the case of new products (new active ingredients) should be derived from experimentation extending over at least two and preferably three seasons, and research should, where applicable, be conducted under varying climatic conditions in areas of the country where the remedy will be applied and on the tobacco types for which registration is intended. The actual number of trials however shall be determined during the initial discussions with the Tobacco and Cotton Research Institute and the relevant advisor.

2.2. Conditions during application such as soil moisture (estimated), growth stage of crop and weeds, cloud cover, wet and dry bulb temperatures, occurrence of dew, etc. must be recorded.

2.3. Details must be furnished concerning type of equipment used for the application of the agent including spray nozzles used, pressure and amount of diluted spray mixture applied per hectare.

2.4. In the case of soil-incorporated or soil-applied herbicides the optimum rate of application must be determined for each of the different soil types, when applicable, e.g. sandy loam, sandy clay loam and sandy clays or clays must be included. The clay percentage for each trial must be specified.

2.5. Evaluation of efficacy and phytotoxicity should be determined under normal farming practices in each of the main tobacco growing areas where the remedy will be registered for use over at least two seasons.

2.6. The success of each remedy as well as phytotoxicity symptoms can be demonstrated by photographs showing treated and control (untreated) plots.

2.7. Where applicable, the different methods of application i.e. high volume, low volume, ULV, aerial etc. should be demonstrated.

2.8. Apart from determining the efficacy of the remedy to control weeds (herbicides) or to affect growth of the tobacco plants (plant growth regulants), the effect of the treatments on the tobacco yield and quality of the cured leaf should also be determined. The following data must be presented: plant height, number of leaves per plant, days of flowering, yield and chemical composition and leaf quality as indicated by the average price per kg as evaluated by a leaf grader from one of the tobacco co-operatives.

Depending upon the variety 16-20 leaves should normally be harvested per plant. Leaf measurements i.e. the length and breadth (in mm) of the 4th, 8th, 12th and 16th leaf from five data plants per plot should be taken at the time of harvest. Conditioned leaves should be graded for quality and price. The effect of the remedy upon the taste and quality of the tobacco must be determined by smoke tests.

3. EFFICACY TRIALS

3.1. Where the efficacy of herbicides is to be tested, test sites should be selected with as wide a range of weeds as possible. In the case of a post emergence treatment, weed size, 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 before application of the herbicide.

3.2. Each plot (herbicides) must have an adjacent small untreated control area which can be used for weed control evaluation.

3.3. In the case of growth regulants, the plots in the efficacy trials must be kept weed free. If necessary, regular hand-weeding, careful mechanical cultivation, or the use of a selective registered herbicide may be called for. The same experiment can therefore be used as an efficacy as well as a phytotoxicity trial. An even stand of tobacco must be selected. The plot size should be 10-15 plants to ensure that 5-10 equal plants are available for data collection. There should be a minimum of two guard plants on either side of the data row. If a double row is used each row should have guard plants. Treatments should be replicated four times.

3.4. The candidate remedy should initially be applied at varying dosage rates which will permit the establishment of a threshold efficacy and the optimum dosage rate. Lower and higher rates than the target dosage rate must be included.

3.5. Where other herbicides or growth regulants have already been registered for use on tobacco at least the most generally used remedy with a similar spectrum of control or reaction should be included as a standard against which the candidate remedy will be evaluated.

3.6. Efficacy can be supported by photographic evidence.

3.7. Sucker control should be assessed by counting the total number of suckers per plant on ten data plants per plot at intervals such as two, four and six weeks after application of the remedy. All suckers should be removed from the plants at six weeks after application and keeping the replicates separate they should be dried and then weighed to obtain the dry weight of suckers per plant.

4. PHYTOTOXICITY

4.1. In the case of herbicides and plant growth regulants it is imperative that plots be kept free of weeds during the entire trial period.

4.2. Separate phytotoxicity studies should be undertaken on different cultivars. Only examples of the main cultivar types grown in South Africa should be included in these studies. New cultivars will be screened for phytotoxic effects of registered herbicides before release for commercial production by the breeder.

4.3. The methods of application should be the same as for the efficacy trials. Treatments must include at least the proposed rate of application and double that rate, as well as an untreated (hand-weeded) control.

4.4. Visual signs of phytotoxicity if any, must be evaluated at regular intervals throughout the active growing period. Effect on yield, changes in growth rate, plant height and/or dry bio-mass produced during the active growing period should be recorded.

4.5. Phytotoxicity should be determined not only in terms of the effect on yield, but can also include changes in growth rate, plant height and/or dry bio-mass produced during the active growing period.

4.6. A description of the phytotoxicity symptoms supported by photographic evidence should be given as well as how the plant will recover.

4.7. Where applicable, e.g. in the case of dinitroanilines, the residual effects of herbicides should be determined and the minimum period for no harmful after-effects to occur should be specified, for tobacco as well as for crops normally succeeding tobacco in the crop rotation system. The residual effects must be determined on three soil types by applying the recommended and double rate with a control in strips on a land area. Other crops normally grown in rotation with tobacco should be planted.