FAO SPECIFICATIONS FOR PLANT PROTECTION PRODUCTS

DIURON WATER-DISPERSIBLE GRANULES (AGP: CP/93, 1992)

FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS

Rome, 1992

DISCLAIMER [1]

FAO specifications are developed with the basic objective of promoting, as far as practicable, the manufacture, distribution and use of pesticides that meet basic quality requirements.

Compliance with the specifications does not constitute an endorsement or warranty of the fitness of a particular pesticide for a particular purpose, including its suitability for the control of any given pest, or its suitability for use in a particular area. Owing to the complexity of the problems involved, the suitability of pesticides for a particular purpose and the content of the labelling instructions must be decided at the national or provincial level.

Furthermore, pesticides which are manufactured to comply with these specifications are not exempted from any safety regulation or other legal or administrative provision applicable to their manufacture, sale, transportation, storage, handling, preparation and/or use.

FAO disclaims any and all liability for any injury, death, loss, damage or other prejudice of any kind that may arise as a result of, or in connection with, the manufacture, sale, transportation, storage, handling, preparation and/or use of pesticides which are found, or are claimed, to have been manufactured to comply with these specifications.

Additionally, FAO wishes to alert users to the fact that improper storage, handling, preparation and/or use of pesticides can result in either a lowering or complete loss of safety and/or efficacy.

FAO is not responsible, and does not accept any liability, for the testing of pesticides for compliance with the specifications, nor for any methods recommended and/or used for testing compliance. As a result, FAO does not in any way warrant or represent that any pesticide claimed to comply with a FAO specification actually does so.

[1] This disclaimer applies to all specifications published by FAO.

INTRODUCTION TO FAO SPECIFICATIONS DEVELOPED UNDER THE OLD PROCEDURE

Between 1975 and 2000, FAO published booklets of specifications for technical materials and related formulations of plant protection products. Revisions of, and additions to, already published specifications will be issued when necessary. However, all changes and revisions of FAO specifications are now subject to the new procedure described in the *Manual on the development and use of FAO and WHO Specifications for Plant Protection Products*, FAO Plant Production and Protection Paper No. 173, Rome 2002 (*Revised First Edition* available only on the FAO home page of the Internet at: http://www.fao.org/ag/agp/agpp/pesticid/)

FAO specifications developed under the old procedure are based on the requirements defined in the Fourth Edition of the *Manual on the development and use of FAO specifications for plant protection products*, Plant Production and Protection Paper No. 128, Rome 1995.

This manual contained detailed definitions and other essential background information on basic procedures and technical principles adopted by the group on Pesticide Specifications of the FAO Panel of Experts on Pesticide Specifications, Registration Requirements, Application Standards and Prior Informed Consent, such as:

1. Categories of Specifications (Section 3.1 of the Manual)

   FAO Tentative Specifications (Code 'S/T', formerly 'TS') are those which have been recommended by FAO as preliminary specifications and which are based on minimum requirements. The methods of analysis cited are normally supplied by the manufacturer or may already have been published or be the subject of collaborative work.

   FAO Provisional Specifications [Code 'S/P', formerly ('S')] are those for which more evidence of the necessary parameters is available and where some collaborative study of the methods of analysis has been carried out.

   FAO (full) Specifications (Code 'S/F', formerly 'S').
   Specifications that have all necessary requirements together with CIPAC (full) methods, or other collaboratively studied (proven) methods.[2, 3]

   Wherever possible, standards for apparatus and common names for pesticides are those approved by the International Organization for Standardization (ISO).

2. Expression of active ingredient content (Section 4.2.5 of the Manual)

   - for solids, liquid technical materials, volatile liquids (of maximum boiling point 50°C) and viscous liquids (with minimum kinematic viscosity of 1×10^3 m^2/s at 20°C) the FAO Specification shall be based on expression of the content as g/kg;

- for all other liquids the active ingredient content of the product shall be declared in terms of g/kg *or* g/l at 20°C. If the customer requires both g/kg *and* g/l at 20°C, then in case of dispute the analytical results shall be calculated as g/kg.

3. Tolerance on content (Section 4.2.7 of the Manual)

A declared content of active ingredient must be included in all specifications, and one of the problems immediately arising is the level of tolerance acceptable about the nominal figure. The tolerance is influenced by (a) the reproducibility of the method of analysis, (b) the sampling error and (c) the manufacturing variance.

Allowable variations in analytical results (i.e. tolerances in content of active ingredient) with respect to specific pesticide consignments are intended to cover reasonable variations in the contents of active ingredients. For examples of such tolerances, see the table in Section 4.2.7 of the Manual.

4. Containers/packaging

FAO guidelines are in preparation.

Containers shall comply with pertinent national and international transport and safety regulations.

Technical materials, dustable powders and granules

Containers shall be suitable, clean, dry and as specified, and shall not adversely affect, or be affected by, the contents, but shall adequately protect them against external conditions.

Wettable powders

The product shall be packed in suitable, clean, dry containers as specified in the order. The container shall provide all necessary protection against compaction, atmospheric moisture, loss by vaporization and/or contamination to ensure that the product suffers no deterioration under normal transit and storage conditions.

The product shall be protected by an adequate moisture barrier. This may be a suitable bag of polyethylene or alternative means of giving equal or better protection.

Solutions and emulsifiable concentrates

Containers shall be lined, where necessary, with a suitable material, or the interior surfaces shall be treated to prevent corrosion and/or deterioration of the contents.

Additional information should be given in all specifications where particular pesticides present problems in packaging.

5. Biological information

Phytotoxicity

No test can be specified to cover the possible phytotoxicity of a formulation to all crops. When a crop is not mentioned in the instructions for use, purchasers should check with the supplier that the material is suitable, always provided that such a use is not restricted or legally forbidden.

Wetting of crops

The dilute spray should satisfactorily wet the leaves of the specified crops when used in accordance with the instructions. Test method MT 53.2, CIPAC F, p.162, may be useful.

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[1] *Should national pesticide specifications developed from these approved FAO specifications deviate from them, the National Authority responsible for making such changes is requested to inform the FAO Plant Protection Service of the nature of, and the reasons for, the modifications.*

[2] *Methods of analysis and miscellaneous techniques referred to in these specifications have been developed and adopted by CIPAC (Collaborative International Pesticides Analytical Council Ltd.). See CIPAC Handbooks 1 (1970), 1A (1980), 1B (1983), 1C (1985), D (1988), E (1993), F (1995), G (1995), CIPAC Proceedings 1980 and 1981, obtainable from Black Bear Press Limited, King's Hedges Road, Cambridge CB4 2PQ, England. The page numbers of specific methods are given in parentheses in the specifications. Copies of methods not yet published can be obtained from the FAO Plant Protection Service.*

[3] *Information on standard waters for laboratory evaluation of pesticidal formulations will be found in CIPAC Monograph 1,* Standard Waters and an FAO Survey on Naturally Occurring Waters *(1972), Black Bear Press Limited, King's Hedges Road, Cambridge CB4 2PQ, England.*

SUBMISSION OF DRAFT SPECIFICATIONS TO FAO

Any organization, commercial firm or interested individual is encouraged to submit relevant specifications, or proposals for revision of existing specifications, for pesticide products for consideration and possible adoption by FAO. Correspondence should be addressed to the Pesticide Management Group, Plant Production and Protection Division, FAO, Via delle Terme di Caracalla, 00153, Rome, Italy.

General guidelines in preparing draft specifications are given in the *Manual on the development and use of FAO and WHO Specifications for Plant Protection Products*, FAO Plant Production and Protection Paper No. 173, Rome 2002 (Revised First Edition available only on the FAO home page of the Internet at: http://www.fao.org/ag/agp/agpp/pesticid/).

Specifications which are considered suitable for further processing are assigned priorities and circulated to appropriate organizations and specialists to comment. Comments, together with other relevant information, are then reviewed in detail by the Group on Specifications of the FAO Panel of Experts on Pesticide Specifications, Registration Requirements, Application Standards and Prior Informed Consent. The drafts are converted into FAO Provisional Specifications, or full FAO Specifications.

DIURON WATER-DISPERSIBLE GRANULES

The FAO Specifications for:

- diuron technical (TC)
- diuron dispersible powders (WP)

are published in the FAO Booklet AGP: CP/93, 1980

DIURON WATER-DISPERSIBLE GRANULES

FAO Specification 100/WG/S (1990)

.1 DESCRIPTION

The material shall consist of a homogeneous mixture of technical diuron, complying with the requirements of FAO Specification 100/1/S/11 (Note 1), together with filler(s) and any other necessary formulants. It shall be in the form of granules to be applied after disintegration and dispersion in water. The product shall be dry, free-flowing and free from visible extraneous matter and hard lumps (Note 2).

.2 ACTIVE INGREDIENT

.2.1 Identity tests (MT 137, CIPAC 1A, p.1630)

Where the identity of the active ingredient is in doubt, then the isolated active ingredient shall comply with at least one additional test.

.2.2 Diuron[1]

The diuron content shall be declared (g/kg) and, when determined, the content obtained shall not differ from that declared by more than the following amounts:

Declared content	Permitted tolerance
up to 250 g/kg	± 6% of the declared content
250 to 500 g/kg	± 5% of the declared content
above 500 g/kg	± 25 g/kg

.3 IMPURITIES

.3.1 Free amine salts[2]

Maximum: 0.4% of the diuron content found under .2.2., calculated as dimethylamine hydrochloride.

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[1] Method 100/3/M/5.3, CIPAC 1A, p.1252, may be used

[2] Method 100/3/M/5.5, CIPAC 1A, p.1252, may be used

.3.2 Water (MT 30.1, CIPAC 1, p.897)

Maximum: 15 g/kg.

.4 PHYSICAL PROPERTIES

.4.1 pH of the aqueous dispersion (MT 75, CIPAC 1A, p.1590)

pH range: 6.0 to 10.0

.4.2 Wetting of the material (MT 53.3.1, CIPAC 1, p.967)

It shall be completely wetted in 10 seconds without swirling.

.4.3 Wet sieve test (CIPAC MT 167)[1]

Maximum: 2.0% retained on a 75 ım test sieve.

.4.4 Suspensibility (CIPAC MT 168)[1]

A minimum of 60% of the diuron content found under .2.2 shall be in suspension after 30 minutes in CIPAC Standard Water C (Notes 3 and 4).

Alternatively, if the buyer requires other CIPAC Standard Waters to be used, then this shall be specified when ordering.

.4.5 Degree of dispersion (CIPAC MT 174)[1]

Still under consideration.

.4.6 Persistent foam (MT 47.2, CIPAC 1C, p.2249) (Note 5)

Maximum: 15 ml after 1 minute.

.4.7 Dustiness (CIPAC MT 171, Gravimetric method)[1]

Maximum: 12 mg collected dust (Note 6).

.4.8 Flowability (CIPAC MT 172)[1]

At least 99% of the product shall pass through a 5 mm test sieve after 20 drops of the sieve.

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[1] Methods available from the Plant Protection Officer, FAO Plant Production and Protection Division

.5 STORAGE STABILITY

.5.1 Stability at 54°C (MT 46.1.1, CIPAC 1, p.951)

After storage at 54 ± 2°C for 14 days, the product shall continue to comply with .2.2, .4.1, .4.3, .4.4, .4.7 and, if required, .4.2, .4.6 and .4.8.

Note 1 This specification is available from the FAO publication AGP: CP/93 *FAO Specification for Plant Protection Products: Monuron, Diuron, Linuron*

Note 2 To describe a specific product, it is recommended to add information about the form (e.g. irregular shape, nearly spherical, cylindrical, ...) and to mention the nominal size range.

Note 3 To reduce the analytical expense, the gravimetric method may be used on a routine basis provided that it has been shown to give equal results to those of the chemical assay method. In case of dispute, the chemical method shall be the referee method.

Note 4 The product should be tested at the highest and lowest rates of use recommended by the supplier, provided this does not exceed the conditions given in method MT 168.

Note 5 The amount of sample to be used in the test should be specified. Usually, the test should be carried out at the application concentration.

Note 6 The optical method MT 171 usually shows good correlation with the gravimetric method and can therefore be used as an alternative, where the equipment is available. Where the correlation is in doubt, it must be checked with the product to be tested.

From experience, 30 mg of dust collected with the gravimetric method corresponds to a dust value of 25 with the optical method.