



Food and Agriculture Organization
of the United Nations

AGP: CP/210

FAO SPECIFICATIONS
FOR PLANT PROTECTION PRODUCTS

BIORESMETHRIN

5-benzyl-3-furymethyl
(1R)-trans-chrysanthemate

Food and Agriculture Organization of the United Nations
Rome, 1984

Group on Pesticide Specifications

FAO Panel of Experts on Pesticide Specifications, Registration Requirements and Application
Standards

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CONTENTS

DISCLAIMER	1
INTRODUCTION	2
INFORMATION	5
FAO Specification	Status 1983
BIORESMETHRIN TECHNICAL	6
BIORESMETHRIN + PIPERONYL BUTOXIDE SOLUTION	7
BIORESMETHRIN + PIPERONYL BUTOXIDE EMULSIFIABLE CONCENTRATES	10
SUBMISSION OF DRAFT SPECIFICATIONS TO FAO	13

DISCLAIMER

FAO specifications are developed with the basic objective of ensuring, as far as possible, that pesticides complying with them are satisfactory for the purpose for which they are intended. However, the Group on Pesticide Specifications of the FAO Panel of Experts on Pesticide Specifications, Registration Requirements, Application Standards and Prior Informed Consent wishes to emphasize that, owing to the complexity of the problem involved, questions such as the suitability of pesticides for the control of a particular pest must be decided at national or provincial level. These specifications should not be assumed to be an endorsement of the use of a particular compound for a given purpose by either the Group of Experts or FAO.

Accordingly, neither the Food and Agriculture Organization of the United Nations (FAO) nor the members of the Group on Pesticide Specifications of the FAO Panel of Experts on Pesticide Specifications, Registration Requirements, Application Standards and Prior Informed Consent warrant that pesticides complying with these specifications are suitable for control of any given pest or for use in an particular area.

Furthermore, the preparation and use of pesticides complying with these specifications are not exempt from any safety regulation or other legal or regulatory provision applicable thereto. Neither FAO nor any member of the FAO Group of Experts shall be liable for any injury, loss, damage or prejudice of any kind that may be suffered as a result of the preparation or use of pesticides complying with these specifications.

Additionally, the Group of Experts wishes to warn users of specifications that improper field mixing and/or application of pesticides can result in either a lowering or complete loss of their efficacy. This holds true even in cases where such pesticides comply with the specifications indicated.

Accordingly, the Group of Experts and/or FAO can accept no responsibility for the consequences of improper field mixing and/or application.

INTRODUCTION

From time to time, FAO publishes 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, but during the interval between editions, revisions may be printed in the FAO Plant Protection Bulletin.

The specifications contained herein have been carefully reviewed and agreed by the Group on Pesticide Specifications of the FAO Panel of Experts on Pesticide Specifications, Registration Requirements and Application Standards after consultation with official government scientists, the pesticides industry through GIFAP (Groupement International des Associations Nationales de Fabricants de Produits Agrochimiques) and, where appropriate, with individual manufacturers 1/.

FAO now publishes three classes of specifications:

A) FAO Specifications (Code "S"): specifications that are acceptable on the basis of the evidence presented 2/, 3/.

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), and CIPAC Proceedings 1980 and 1981, obtainable from Heffers Printers Limited, King's Hedges Road, Cambridge CB4 2PQ, England. The page numbers of specific methods are given in brackets in the specifications. A copy of a method 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). Heffers Printers Limited, King's Hedges Road, Cambridge. CB4 2PQ, England.

B) FAO Provisional Specifications (Code "(S)"): specifications which are usable but may require some further work (e.g., final clarifications of certain methods of analysis).

C) FAO Tentative Specifications (Code "ts"): specifications that the Group on Specifications believe may prove useful but for which critical data (e.g., collaboratively studied methods of analysis) may not yet be available.

The clauses of the specifications are divided into "requirements" and "information", the latter being indicated in the individual specifications by an asterisk. The information clauses provide the buyer with additional safeguards by indicating potential difficulties for which adoption of a definite requirement is not yet practicable.

Wherever possible, standards for apparatus and common names for pesticides are those approved by the International Standards Organization (ISO). Where such standards and names are not available, those recommended by the British Standards Institution (BSI) are used.

For solids, technical liquids, volatile liquids (of maximum boiling point 50°C) and viscous liquids (with minimum viscosity of 1000 centipoises at 20 C) the FAO Specifications shall be based on a grammes/kilogram (g/kg) expression of content. For all other liquids the active ingredient content of the product shall be declared in terms of grammes per litre (g/l) at 20° C. The content may also be requested in terms of g/kg and density.

In the cases of dispute, however, where a user of the specifications has information on the content both in terms of g/l and g/kg, the g/kg value will be accepted as the correct statement of content.

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 content of active ingredient during manufacture, but mainly to compensate for possible inaccuracies in relevant methods of analysis. For examples of such permitted tolerances, see document mentioned in footnote 4/.

4/ For 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 and Application Standards, see Plant Production and Protection Paper 13, "The Use of FAO Specifications for Plant Protection Products", FAO, Rome, 1979 (Available in English, French or Spanish).

INFORMATION

COMMON NAME: Bioresmethrin (ISO)

CIPAC CODE NUMBER: 222

EMPIRICAL FORMULA: C₂₂H₂₆O₃

RMM: 338.4

CHEMICAL NAME:

5-benzyl-3-furylmethyl (1R)-trans-chrysanthemate

(IUPAC)

(5-phenylmethyl-3-furanyl)methyl (1R-trans)-2,2-dimethyl-3-(2-methyl-1-propenyl)cyclopropanecarboxylate (CA; Registry No. 28434-01-7)

BIORESMETHRIN TECHNICAL
FAO Tentative Specification October 1983
(222/TC/ts/-)

.1 DESCRIPTION

The material shall consist of bioresmethrin together with related manufacturing impurities. It shall be a viscous yellow to reddish-brown liquid which partially solidifies on standing. It shall be free from visible extraneous matter and added modifying agents.

.2 ACTIVE INGREDIENT

.2.1 Identity tests*

Where the identity of the material is in doubt, then it shall comply with the tests.

.2.2 Bioresmethrin*

The bioresmethrin content shall be declared (minimum content: 930 g/kg of total isomers) and when determined, the content obtained shall not differ from that declared by more than +/- 20 g.

.3 PHYSICAL PROPERTIES

.3.1 Optical Rotation*

20
[a] (5% in ethanol) -5 to -8 C
D

.4 CONTAINERS

They should be suitable, clean, dry and as specified in the order and should adequately protect the material from external influences.

They should comply with pertinent national and international transport and safety regulations.

* Method available from the Plant Protection Officer, FAO Plant Production and Protection Service.

BIORESMETHRIN + PIPERONYL BUTOXIDE SOLUTIONS

FAO Tentative Specification October 1983

(222+33/SL/tc/-)

.1 DESCRIPTION

The product shall consist of a solution, based on bioresmethrin (complying with the FAO Tentative Specification October 1983) as the active ingredient, synergized with piperonyl butoxide (complying with the FAO Tentative Specification October 1983) together with any necessary formulants. It shall be free from visible suspended matter and sediment.

.2 ACTIVE INGREDIENT**.2.1 Identity tests***

Where the identity of the active ingredient(s) is in doubt, then the isolated active ingredients shall comply with the tests.

.2.2 Bioresmethrin*

The bioresmethrin content shall be declared (g/l at 20 C or g/kg; Note 1) and when determined, the content obtained shall not differ from that declared by more than +/- 5 % of the declared content.

.2.3 Piperonyl butoxide*

The piperonyl butoxide content shall be declared (g/l at 20 C or g/kg; Note 1) and when determined, the content obtained shall not differ from that declared by more than +/- 5% of the declared content.

.3 IMPURITIES**.3.1 WATER** (MT 30.1, CIPAC 1, p. 897)

Maximum: 5 g/kg

.4 PHYSICAL PROPERTIES**.4.1 Flash point** (MT 12, CIPAC 1, p. 846)

* Method available from the Plant Protection Officer, FAO Plant Production and Protection Service or <http://www.fao.org/pest-and-pesticide-management/en/>

The flash point of the product shall be not lower than the minimum declared flash point (Note 2). The procedure used shall be stated, e.g. Abel Method.

.4.2 Miscibility with hydrocarbon oil (MT 23, CIPAC 1, p.891)

If required, the product shall be miscible with the appropriate hydrocarbon oil.

.4.3 Viscosity at 20 C (MT 22, CIPAC 1, p. 882)

If required, the viscosity range of the product shall be declared. The method used shall be stated.

.5 STORAGE STABILITY

.5.1 Stability at 0°C (MT 39.1, CIPAC 1, p. 930)

After storage at 0 °C for 7 days, the volume of solid or liquid which separates shall be not more than 3 ml/l.

.5.2 Stability at 54 C (MT 46.1.3, CIPAC 1, p. 952)

After storage at 54 +/- 2 C for 14 days, the product shall continue to comply with .2.2 and .2.3.

.6 CONTAINERS

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

They should comply with pertinent national and international transport and safety regulations.

.7 BIOLOGICAL PROPERTIES

.7.1 Phytotoxicity

No single test can be specified to cover phytotoxicity of formulations to all crops.

When a crop is not mentioned in the instructions for use, the buyer should check with the supplier that the material is suitable, always provided that such a use is not restricted or legally forbidden.

.7.2 Wetting of crops

The dilute spray should satisfactorily wet the leaves of the specified crops when used in accordance with the instructions for use. The test described in MT 53.2 (CIPAC 1, p. 965) may be useful.

NOTE 1 If the buyer requires both g/l at 20 C and g/kg, then in case of dispute the analytical results shall be calculated as g/kg.

NOTE 2 Attention is drawn to the appropriate national and international regulations on handling and transport of flammable materials.

BIORESMETHRIN + PIPERONYL BUTOXIDE EMULSIFIABLE CONCENTRATES
FAO Tentative Specification October 1983
(222+33/EC/ts/-)

.1 DESCRIPTION

The product shall consist of an emulsifiable concentrate based on bioresmethrin (complying with the FAO Tentative Specification October 1983) as the active ingredient synergised with piperonyl butoxide, (complying with the FAO Tentative Specification October 1983) together with suitable solvents and any necessary formulants. It shall be free from visible suspended matter and sediment.

.2 ACTIVE INGREDIENT

.2.1 Identity tests*

Where the identity of the active ingredient(s) is in doubt, then the isolated active ingredient shall comply with the tests.

.2.2 Bioresmethrin*

The bioresmethrin content (g/l at 20°C or g/kg; Note 1) shall be declared and when determined, the content obtained shall not differ from that declared by more than + 5X of

.2.3 Piperonyl butoxide*

The piperonyl butoxide content (g/l at 20 C or g/kg; Note 1) shall be declared and when determined, the content obtained shall not differ from that declared by more than +/-5% of the declared content.

.3 IMPURITIES

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

Maximum: 5 g/kg

.4 PHYSICAL PROPERTIES

.4.1 Emulsion stability and re-emulsification (MT 36.1.1, CIPAC 1, p. 910)

* Method available from the Plant Protection Officer, FAO Plant Production and Protection Service.

After the stability test at 54°C (.5.2), the product, when diluted at 30 C (Note 2) with the specified CIPAC Standard Waters, shall comply with the following:

<u>Time after dilution</u>	<u>Limits</u>
0 h complete	Initial emulsification :
0.5 h ml	'Cream' : maximum : 0.2
2 h ml	'Cream' : maximum : 0.2
24 h complete	'Free oil' : nil Re-emulsification :
24.5 h ml	'Cream' : maximum : 0.2 'Free oil' : nil

The product shall be tested in Standard Water A and in Standard Water C.

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

.4.2 Flash point (MT 12, CIPAC 1, p. 846)

If required, the flash point of the product shall be not lower than the minimum declared flash point. The procedure used shall be stated, e.g., Abel method (Note 3).

.5 STORAGE STABILITY

.5.1 Stability at 0 C (MT 39.1, CIPAC 1, p. 930)

After storage at 0 C for 7 days the volume of solid or liquid which separates shall be not more than 3 ml/l.

.5.2 Stability at 54 C (MT 46.1.3, CIPAC 1, p. 952)

After storage at 54 +/- 2 C for 14 days the product shall continue to comply with .2.2, .2.3, .4.1 and .5.1.

.6 CONTAINERS

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

They should comply with pertinent national and international transport and safety regulations.

.7 BIOLOGICAL PROPERTIES

.7.1 Phytotoxicity

No single test can be specified to cover phytotoxicity of formulations to all crops.

When a crop is not mentioned in the instructions for use, the buyer should check with the supplier that the material is suitable, always provided that such a use is not restricted or legally forbidden.

.7.2 Wetting of crops

The dilute spray should satisfactorily wet the leaves of the specified crops when used in accordance with the instructions for use. The test described in MT 53.2 (CIPAC 1, p. 965) may be useful.

Note 1 If the buyer requires both g/l at 20 C and g/kg; then in case of dispute the analytical results shall be calculated as g/kg.

Note 2 Unless other temperatures are specified.

Note 3 Attention is drawn to the appropriate national and international regulations concerning handling and transport of flammable materials.

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 Pesticides Control Officer, Plant Production and Protection Division, FAO, Via delle Terme di Caracalla, 00100, Rome, Italy.

FAO has published a 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.