AGP: CP/100

FAO SPECIFICATIONS
FOR PLANT PROTECTION PRODUCTS

2,4-D

Food and Agriculture Organization of the United Nations
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Group on Pesticide Specifications

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

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1/ Supersedes previous version published in 1972 (AGP:CP/45)

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:	2,4-D
CIPAC CODE NUMBER:	1
EMPIRICAL FORMULA:	$C_8H_6Cl_2O_3$
RMM:	221.0

CHEMICAL NAMES:

2,4-D is the ISO common name for (2,4-dichlorophenoxy) acetic acid (IUPAC and CA ; Registry No. 94-75-7).

2,4-D TECHNICAL

FAO Provisional Specification October 1983
(1/TC/(S)/-)

.1 DESCRIPTION

The material shall consist of grades of 2,4-D together with related manufacturing impurities, which are white to brown crystals, granules, flakes, powder or lumps with not more than slight odour.

.2 ACTIVE INGREDIENT

.2.1 Identity tests (CIPAC P81, p. 153)

Where the identity of material is in doubt the extractable acids shall comply with any two of the following tests:

.2.1.1 Melting point (liquefaction point)

137 to 141 C.

The melting point shall not be depressed by admixture with an equal quantity of 2,4-D.

.2.1.2 IR

The spectrum produced from the sample shall be consistent with that produced from a standard 2,4-D.

.2.1.3 GLC

The major component in the sample chromatogram shall have the same retention time as that from a standard 2,4-D chromatographed under identical conditions.

.2.1.4 TLC

The major component in the sample chromatogram shall have the same Rf value as that from a standard 2,4-D.

.2.2 Extractable acids (CIPAC P81, p. 153)

The total extractable acid content calculated on the anhydrous basis and expressed as 2,4-D shall be not more than 1.11x where x is the content of 2,4-D found under 2.3

2.3 2,4-D*

The 2,4-D content shall be declared (minimum declared 890 g/kg) calculated on the anhydrous basis and when determined the content obtained shall not differ from that declared by more than +/- 25g.

.3 WATER (MT 30.2, CIPAC 1, p. 899)

.3.1 Dry acids

Maximum: 15 g/kg (Note 1)

.3.2 Wet acids

Material containing more than 15 g/kg of water is available (Note 2). The approximate water content shall be stated.

.4 IMPURITIES

.4.1 Free phenols (MT 69.1, CIPAC 1, p.998)

Maximum: 5 g/kg (Note 3), expressed as 2,4-dichlorophenol (Note 4), of the 2,4-D content found under .2.3 (Note 5).

.4.2 Sulphated ash (MT 29.1, CIPAC 1A, p. 1562; Note 6)

Maximum: 10 g/kg

.4.3 Triethanolamine insolubles*

A triethanolamine solution of the material shall leave not more than 1 g/kg of residue on a 105 µm test sieve and the sieved solution shall be clear or opalescent and shall contain not more than a trace of sediment.

.5 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.

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

NOTE 1 Use 50 g of sample.

NOTE 2 Difficulties of obtaining representative samples increase with increasing water content and may lead to erroneous results. The validity of the methods cited has been established only for technical materials containing up to 15 g/kg water.

NOTE 3 Interim limit which will be reviewed when collaborative work is complete on determination of free phenols.

NOTE 4 The content of free phenols is limited to avoid possible taint of neighbouring crops and foodstuffs.

NOTE 5 On a 900 g/kg 2,4-D content the maximum permitted free phenol content would be 4.5 g/kg of the material.

NOTE 6 Use 10 g of sample.

2,4-D SODIUM SALT TECHNICAL
FAO Provisional Specification October 1983
(l.lNa/TC/(S)/-)

.1 DESCRIPTION

The material shall consist of 2,4-D sodium salt monohydrate together with related manufacturing impurities. It is a white to brown crystalline powder with not more than slight odour.

.2 ACTIVE INGREDIENT

.2.1 Identify tests*

Where the identity of the material is in doubt the extractable acids shall comply with any two of the following tests:

.2.1.1 Melting point (liquefaction point)

137 to 141°C.

The melting point shall not be depressed by admixture with an equal quantity of 2,4-D.

.2.1.2 IR

The spectrum produced from the sample shall be consistent with that produced from a standard 2,4-D.

.2.1.3 GLC

The major component in the sample chromatogram shall have the same retention time as that from a standard 2,4-D chromatographed under identical conditions.

.2.1.4 TLC

The major component in the sample chromatogram shall have the same Rf value as that from a standard 2,4-D.

.2.2 Extractable acids*

The total extractable acid content calculated on the anhydrous basis and expressed as 2,4-D shall be not more than 1.11x where x is the content of 2,4-D found under 2.3

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

.2.3 2,4-D*

The 2,4-D content shall be declared (minimum declared 810 g/kg) calculated on the anhydrous basis and when determined the content obtained shall not differ from that declared by more than +/- 25 g.

.3 IMPURITIES

.3.1 Free phenols (MT 69.1, CIPAC 1, p. 248)

Maximum: 5 g/kg (Note 1), expressed as 2,4-dichlorophenol (Note 2), of the 2,4-D content found under .2.3 (Note 3).

.3.2 Water (free water and water of hydration) (MT 30.2, CIPAC 1, p. 899)

Maximum: 90 g/kg

.3.3 Water insolubles*

An aqueous solution of the material shall pass completely through a 250 µm test sieve, not more than 1 g/kg shall remain on a 150 µm test sieve, and the sieved solution shall be clear or opalescent and shall contain not more than a trace of sediment.

.4 PHYSICAL PROPERTIES

.4.1 Rate of solution*

All the product, other than the insoluble material content found under .3.3, shall dissolve in 5 min in distilled water and the solution, after standing for 18 h, shall have not more than a trace of additional sediment.

.5 CONTAINERS

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

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

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

NOTE 1 Interim limit which will be reviewed when collaborative work is complete on determination of free phenols.

NOTE 2 The content of free phenols is limited to avoid possible taint of neighbouring crops and foodstuffs.

NOTE 3 On a 810 g/kg 2,4-D content the maximum permitted free phenol content would be 4.1 g/kg.

2,4-D TECHNICAL ESTERS

FAO Provisional Specification October 1983
(l.3/TC/(S) /-)

.1 DESCRIPTION

The material shall consist of 2,4-D technical ester(s), together with related manufacturing impurities. It shall be free from visible water and suspended matter.

.2 ACTIVE INGREDIENT

.2.1 Ester(s)

The 2,4-D ester(s) present shall be stated (Note 1), i.e. "R" shall be declared.

.2.2 Identity tests*

Where the identity of the material is in doubt the extractable acids shall comply with any two of the following tests:

.2.2.1 Melting point (liquefaction point)

135 to 141°C.

The melting point shall not be depressed by admixture with an equal quantity of a standard 2,4-D

.2.2.2 IR

The spectrum produced from the sample shall be consistent with that produced from a standard 2,4-D

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

.2.2.3 GLC

The major component in the sample chromatogram shall have the same retention time as that from a standard 2,4-D chromatographed under identical conditions.

.2.2.4 TLC

The major component in the sample chromatogram shall have the same Rf value as that from a standard 2,4-D.

.2.3 Extractable acids*

The total extractable acid content calculated on the anhydrous basis and expressed as 2,4-D shall be not more than 1.11x where x is the content of 2,4-D found under 2.4.

.2.4 2,4-D*

The nominal 2,4-D content shall be declared (minimum declared: 890 g/kg of the theoretical extractable acid content)and when determined, the content obtained shall differ from that declared by not more than +/- 50 g.

.3 IMPURITIES

.3.1 Free phenols (MT 69.1, CIPAC 1, p. 998)

Maximum: 5 g/kg (Note 2) calculated as 2,4-dichlorophenol (Note 3), of the 2,4-D content found under .2.4 (Note 4)

.3.2 Free acidity*

Maximum: 30 g/kg, expressed as 2,4-D, of the extractable acid content found under .2.3.

.3.3 Suspended solids (MT 40.2, CIPAC 1, p. 932)

Maximum: 1 g/kg.

.3.4 Water content (MT 40.1, CIPAC 1, p. 932)

Visible water shall be absent.

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

.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.

NOTE 1 In the case of mixed esters the approximate content of each shall be stated.

NOTE 2 Interim limit which will be reviewed when collaborative work is complete on determination of free phenols.

NOTE 3 The content of free phenols is limited to avoid possible taint of neighbouring crops and foodstuffs.

NOTE 4 On a 2,4-D content of 700 g/kg the maximum permitted free phenol content would be 3.5 g/kg of the material.

2,4-D SODIUM SALT WATER SOLUBLE POWDERS

FAO PROVISIONAL SPECIFICATION OCTOBER 1983

(1.1NA/SP/(S)/-)

.1 DESCRIPTION

The product shall consist of 2,4-D sodium salt (complying with FAO Provisional Specification October 1983) as the active ingredient formulated as a water soluble powder for use in sprays.

.2 ACTIVE INGREDIENT

.2.1 Identity tests*

Where the identity of the active ingredient is in doubt the extractable acids shall comply with any two of the following tests:

.2.1.1 Melting point (liquefaction point)

137 to 141°C.

The melting point shall not be depressed by admixture with an equal quantity of a standard 2,4-D.

.2.1.2 IR

The spectrum produced from the sample shall be consistent with that produced from a standard 2,4-D.

.2.1.3 GLC

The major component in the sample chromatogram shall have the same retention time as that from a standard 2,4-D chromatographed under identical conditions.

.2.1.4 TLC

The major component in the sample chromatogram shall have the same Rf value as that from a standard 2,4-D.

.2.2 Extractable acids*

The extractable acid content expressed as 2,4-D shall be not more than 1.11 x where x is the content of 2,4-D found under .2.3 (Note 1).

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

.2.3 2,4-D*

The nominal 2,4-D content, calculated on the anhydrous basis, shall be declared (g/kg) and when determined the content obtained shall differ from that declared by not more than +/- 5% of the declared content.

.3 IMPURITIES

.3.1 Free phenols (MT 69.1, CIPAC 1, p. 248)

Maximum: 5 g/kg (Note 2), expressed as 2,4-dichlorophenol (Note 3), of the 2,4-D content found under .2.3 (Note 4).

.3.2 Water insolubles*

When the product is dissolved in Standard Water C, any insoluble material shall pass completely through a 250 µm test sieve, not more than 1 g/kg shall remain on a 150 µm test sieve, and the sieved solution shall be clear or opalescent and shall contain not more than a trace of sediment.

.4 PHYSICAL PROPERTIES

.4.1 Rate of solution*

All the product, other than the insoluble material found under .3.2, shall dissolve in 5 min in CIPAC Standard Water C at 20 +/- 1°C and the resulting solution after standing for 18 h shall contain not more than a trace of additional sediment.

.5 STORAGE STABILITY

.5.1 Stability at 54°C*

After storage at 54 +/- 2°C for 14 days the product shall continue to comply with .2.3, .3.2 and .4.1.

.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.

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

NOTE 1 On a 2,4-D content of 800 g/kg the maximum permitted extractable acid content would be 1.11 x 800, i.e., 888 g/kg.

NOTE 2 Interim limit which will be reviewed when collaborative work is complete on determination of free phenols.

NOTE 3 The content of free phenols is limited to avoid possible taint of neighbouring crops and foodstuffs.

NOTE 4 On a declared 2,4-D content of 800 g/kg the maximum permitted free phenol would be 4 g/kg of the product.

2,4-D SALT AQUEOUS SOLUTIONS

FAO Provisional Specification October 1983
(1.1/SL/(S)/-)

.1 DESCRIPTION

The product shall consist of 2,4-D (complying with FAO Provisional Specification October 1983) as the active ingredient, formulated as a 2,4-D salt aqueous solution. It shall be free from visible suspended matter and sediment.

.2 ACTIVE INGREDIENT

.2.1 Salt(s)

The name of the salt(s) present shall be stated (Note 1).

.2.2 Identity tests*

Where the identity of the active ingredient is in doubt the extractable acids shall comply with any two of the following tests:

.2.2.1 Melting point (liquefaction point)

137 to 141°C.

The melting point shall not be depressed by admixture with an equal quantity of a standard 2,4-D.

.2.2.2 IR

The spectrum produced from the sample shall be consistent with that produced from a standard 2,4-D.

.2.2.3 GLC

The major component in the sample chromatogram shall have the same retention time as that from a standard 2,4-D chromatographed under identical conditions.

.2.2.4 TLC

The major component in the sample chromatogram shall have the same Rf value as that from a standard 2,4-D.

.2.3 Extractable acids*

The extractable acid content expressed as 2,4-D shall be not more than 1.11x where x is the content of 2,4-D found under .2.4 (Note 2).

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

.2.4 2,4-D*

The nominal 2,4-D content shall be declared (g/l at 20 C or g/kg; Note 3) and when determined the content obtained shall differ from that declared by not more than +/- 5% of the declared content.

.3 IMPURITIES

.3.1 Free phenols (MT 69.1, CIPAC 1, p. 998)

Maximum: 5 g/kg (Note 4), expressed as 2,4-dichlorophenol (Note 5), of the 2,4-D content found under .2.4 (Note 6).

.3.2 Water insolubles*

The product shall pass through a 250 µm test sieve and not more than 1 g/kg shall remain on a 150 µm test sieve.

.4 PHYSICAL PROPERTIES

.4.1 Stability on dilution (MT 41, CIPAC 1, p. 933)

The product, after dilution with CIPAC Standard Water C, shall give a clear or opalescent solution, i.e., free from more than a trace of sediment and/or visible solid particles.

.5 STORAGE STABILITY

.5.1 Stability at O C (MT 39.2, CIPAC 1, p. 932)
After storage at O C (Note 7) for 48 hours there shall be no separation of material.

.5.2 Stability at 54°C*
After storage at 54 +/- 2°C for 14 days the product shall continue to comply with .2.4, .3.2, .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.

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

NOTE 1 In the case of mixed salt formulations the approximate content of each shall be stated.

NOTE 2 On a 2,4-D content of 400 g/l the maximum permitted extractable acid content would be 400 x 1.11, i.e., 444 g/l.

NOTE 3 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 4 Interim limit which will be reviewed when collaborative work is complete on determination of free phenols.

NOTE 5 The content of free phenol is limited to avoid taint of neighbouring crops and foodstuffs.

NOTE 6 On a content of 400 g/kg the maximum permitted free phenol content would be 2 g/kg of the product.

NOTE 7 test temperature of O C may not be suitable for products intended for use in cold countries and an alternative test temperature may be specified.

2,4-D ESTER EMULSIFIABLE CONCENTRATES

FAO Provisional Specification October 1983
(1.3/EC/(S)/-)

.1 DESCRIPTION

The product shall consist of an emulsifiable concentrate based on 2,4-D ester(s) (complying with the FAO Tentative Specification October 1983) as the active ingredient(s) together with necessary formulants. It shall be free from visible suspended matter and sediment.

.2 ACTIVE INGREDIENT

.2.1 Ester(s)

The name(s) of the 2,4-D ester(s) shall be stated (Note 1).

.2.2 Identity tests*

Where the identity of the material is in doubt the extractable acids shall comply with any two of the following tests:

.2.2.1 Melting point (liquefaction point)

135 to 141°C.
The melting point shall not be depressed by admixture with an equal quantity of 2,4-D.

.2.2.2 IR

The spectrum produced from the sample shall be consistent with that produced from a standard 2,4-D.

.2.2.3 GLC

The major component in the sample chromatogram shall have the same retention time as that from a standard 2,4-D chromatographed under identical conditions.

.2.2.4 TLC

The major component in the sample chromatogram shall have the same Rf value as that from a standard 2,4-D.

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

.2.3 Extractable acids*

The extractable acid content expressed as 2,4-D shall be not more than 1.11x where x is the content of 2,4-D found under .2.4 (Note 2).

.2.4 2,4-D*

The nominal 2,4-D content (g/l at 20 C or g/kg; Note 3) shall be declared and when determined the content obtained (Note 4) shall differ from that declared by not more than +/- 6% of the declared content.

.3 IMPURITIES

.3.1 Free phenols (MT 69.1, CIPAC 1, p. 998)

Maximum: 5 g/kg (Note 5) calculated as 2,4-dichlorophenol (Note 6) of the 2,4-D content found under .2.4 (Note 7).

.3.2 Material insoluble in oil*

The product shall give a clear, or opalescent, homogeneous solution which shall leave not more than 1 g/l residue on a 150 µm test sieve, and the sieved solution shall contain not more than a trace of sediment.

.3.3 Water (MT 30.1, CIPAC 1, p. 897)
Maximum: 5 g/l

.4 PHYSICAL PROPERTIES

.4.1 Emulsion stability and re-emulsification (MT 36.1, CIPAC 1, p. 910)

After the stability test (.5.2), the product, when diluted at 30°C (Note 8) with the specified CIPAC Standard Waters, shall comply with the following:

Time after dilution	Limits
0 h	Initial emulsification : complete
0.5 h	'Cream' : maximum : 2 ml
2 h	'Cream' : maximum : 4 ml
	'Free oil' : nil
24 h	Re-emulsification : complete
24.5 h	'Cream' : maximum : 4 ml
	'Free oil' : maximum : 0.5 ml

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

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 (Note 9). The method used shall be stated.

.4.3 Volatility (MT 13, CIPAC 1, p. 858)

It shall be stated whether the "volatility" of the product is high or low.

.5 STORAGE STABILITY

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

After storage at 0 C (Note 10) for 7 days the volume of solid and/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 .2.4, .3.2, .4.1, .4.3 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.

NOTE 1 e.g., 2,4-D butyl ester, 2,4-D octyl ester. For products based on mixed esters, the approximate percentage of each shall be stated.

NOTE 2 On a 2,4-D content of 400 g/l the maximum permitted content of extractable acids would be 400 x 1.11, i.e., 444 g/l.

NOTE 3 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 4 The methods of analysis are suitable for the majority of 2,4-D ester emulsificable concentrates, but the butoxyethanol ester has been known to give erratic results, in which case the purchaser and supplier should verify that the method is suitable.

NOTE 5 Interim limit which will be reviewed when collaborative work is complete on determination of free phenols.

NOTE 6 The content of free phenol is limited to avoid taint of neighbouring crops and foodstuffs.

NOTE 7 On a 2,4-D content of 400 g/kg the maximum permitted free phenol content would be 2 g/kg.

NOTE 8 The temperature at which the test is carried out shall be 30°C, unless otherwise specified.

NOTE 9 Attention is drawn to the appropriate national and international regulations concerning handling and transport of flammable materials.

NOTE 10 A test temperature of 0°C may not be suitable for products intended for use in cold countries and an alternative test temperature may be specified.

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.

General guidelines in preparing draft specifications are given in Plant Production and Protection Paper 128, *Manual on the Development and Use of FAO Specifications for Plant Protection Products, Fourth Edition*, FAO, Rome, 1995 (English only).

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.