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O-H-204
15 July 1965

FEDERAL SPECIFICATION

HERBICIDE: DISODIUM METHANEARSONATE, DMA

This specification was approved by the Commissioner, Federal Supply Service, General Services Administration, for use of all Federal Agencies.

1. SCOPE

1.1 This specification covers the water soluble herbicide, 63% disodium methanearsonate (DMA), equivalent to 100% DMA hexahydrate. It is used diluted with water as a selective herbicide primarily for post emergence control of crabgrass. It can also be used in controlling the growth of Dallis grass in Bermuda grass and Zoysia grass.

2. APPLICABLE SPECIFICATIONS, STANDARDS, AND OTHER PUBLICATIONS

2.1 Specifications and Standards. The following specifications and standards of the issue in effect on date of invitation for bids, or request for proposal, form a part of the specification to the extent specified herein.

FEDERAL SPECIFICATIONS

TT-I-558 - Ink, Marking Stencil, Opaque, for Nonporous Surfaces (metals, glass, etc.)

PPP-B-35 - Bags: Textile, Shipping, Burlap, Cotton and Waterproof, Laminated

PPP-D-723 - Drums, Fiber

FEDERAL STANDARDS

Fed. Std. No. 102 - Preservation, Packaging and Packing Levels

Fed. Std. No. 123 - Marking for Domestic Shipment (Civilian Agencies)

(Activities outside the Federal Government may obtain copies of Federal Specifications and Standards as outlined under General Information in the Index of Federal Specifications and Standards at the prices indicated in the Index. The Index, which includes cumulative monthly supplements as issued, is for sale on a subscription basis by the Superintendent of Documents, U.S. Government Printing Office, Washington 25, DC).

Single copies of this specification and other product specifications required by activities outside the Federal Government for bidding purposes are available without charge at the General Services Administration Regional Offices in Boston, New York, Atlanta, Chicago, Kansas City, Mo.; Dallas, Denver, San Francisco, Los Angeles, Seattle, and Washington, DC.

Federal Government activities may obtain copies of Federal Specifications and Standards and the Index of Federal Specifications and Standards from established distribution points in their agencies.

MILITARY SPECIFICATIONS

MIL-A-3941 - Adhesive, Paper Label, Water-Resistant

MILITARY STANDARDS

MIL-STD-105 - Sampling Procedures and Tables for Inspection by Attributes

MIL-STD-129 - Marking for Shipment and Storage

(Copies of specifications, standards, drawings, and publications required by suppliers in connection with specific procurement functions should be obtained from the procuring activity or as directed by the contracting officer.)

2.2 Other Publications. The following documents form a part of this specification to the extent specified herein. Unless otherwise indicated, the issue in effect on date of invitation for bids or request for proposal shall apply.

CODE OF FEDERAL REGULATIONS

7 CFR 362- Agriculture, Regulations for the Enforcement of the Federal Insecticide, Fungicide and Rodenticide Act.

(Copies of the above part of the Code of Federal Regulations may be obtained from the Superintendent of Documents, Government Printing Office, Washington 25, DC).

OFFICIAL CLASSIFICATION COMMITTEE

Uniform Freight Classification Ratings, Rules and Regulations (Application for copies should be addressed to the Official Classification Committee, 1 Park Avenue at 33rd Street, New York 17, NY).

3. REQUIREMENTS

3.1 Chemical Properties - When tested as specified in 4.5, the material shall conform to Table 1.

TABLE I

PROPERTY	REQUIREMENT, % BY WT.		APPLICABLE TEST PARAGRAPH
	MIN.	MAX.	
Disodium Methanearsonate	63.0		4.5.1
Inert Material		37.0	4.5.2
Total Arsenic (As As)	25.5		4.5.3

3.2 pH. The herbicide shall exhibit a pH of no less than 10.0 nor more than 11.5 when tested as specified in 4.5.4.

3.3 Appearance and Pour. The herbicide shall be a free flowing powder which shall be dry, loose, free from lumps and foreign matter and pour smoothly in an unimpeded stream when tested as specified in 4.5.5.

3.4 Workmanship. The finished product shall be free from any defect which might impair its utility. It shall conform to all requirements specified herein.

4. SAMPLING, INSPECTION, AND TEST PROCEDURES

4.1 Responsibility for Inspection. Unless otherwise specified in the contract or purchase order, the supplier is responsible for the performance of all inspection requirements as specified herein. Except as otherwise specified, the supplier may utilize his own facilities or any commercial laboratory acceptable to the Government. The Government reserves the right to perform any of the inspections set forth in the specification where such inspections are deemed necessary to assure supplies and services conform to prescribed requirements.

4.2 Lot.

4.2.1 Herbicide. For purposes of inspection, a lot shall consist of all herbicides produced by one manufacturer under essentially the same conditions and process, within the following limitations. In the event the herbicide is produced by a continuous-run process, the lot shall contain herbicide produced in a period of not more than 24 hours. In the event the herbicide is produced by a batch process each batch shall constitute a lot. Herbicide in the inspection lot shall be identified by order of production when a continuous-run process is involved and by a batch number when a batch process is involved.

4.2.2. Filled Containers. For purposes of inspection, a lot shall consist of all specified containers filled with approved herbicide as required and which are to be offered for delivery at one time under a contract or order.

4.3 Sampling.

4.3.1 Sampling for Tests of Herbicide. Three separate one-pound samples shall be taken from each inspection lot. When herbicide is produced by a continuous-run process the three samples shall be taken so as to represent, respectively, the first part, the middle part, and the last part of the run which constituted the inspection lot. When herbicide is produced by a batch process the three samples shall be taken at different locations within each batch.

4.3.2 Sampling for Examination of Filled Containers. A random sample of filled containers shall be selected from each lot in accordance with Military Standard MIL-STD-105, at Inspection Level I, and an AQL of 2.5 percent defective.

4.4 Examination.

4.4.1 Filled Containers. Each sample filled container selected in accordance with 4.3.2, shall be examined for any defects of the container and the container closure, for evidence of leakage, and for illegible, incorrect or missing marking. Each sample filled container shall also be weighed to determine the net weight of contents. Any filled container having one or more defects shall be considered a defective unit.

4.5 Tests. Samples of herbicide selected in accordance with 4.3.1 shall be subjected separately to the tests specified herein. If any one of the samples fails to pass any one of the tests specified the lot represented therein shall be rejected. Rejected lots may be reinspected provided the manufacturer has corrected all defects. Prior to resubmission of rejected lots, the manufacturer shall furnish full particulars to the Government concerning the rejection and the action taken to correct the defects.

4.5.1 Determination of Disodium Methanearsonate. Disodium Methanearsonate has two neutralization points when titrated against standard acid. The first neutralization point (approximately pH 6.4) corresponds to a dilute solution of sodium acid methanearsonate, the second neutralization point (approximately pH 2.6) corresponds to a dilute solution of methanearsonic acid. The percent DMA present is calculated from the volume of acid used in reaching the second neutralization point since traces of As_2O_3 or As_2O_5 are titrated as their sodium salts in the first titer.

4.5.1.1 Procedure. Dissolve 2.5 grams herbicide in 100 ml distilled water contained in a 250 Erlenmeyer flask. Using a recording titrimeter or a pH meter, add 1.0 N HCl to the flask until the first inflection point previously determined is reached at pH of approximately 6.4. Record amount 1.0 N HCl used. Add 1.0 N HCl until the second inflection point previously determined has been reached. Using the HCl titer obtained between 1st and 2nd inflection points, calculate the percent DMA present as follows:

$$\% Na_2CH_3AsO_3 \cdot 6H_2O = \frac{(ml\ HCl)(N\ HCl)(0.1839)}{gms\ sample} \times 100$$

4.5.2 Inert Material. Inert material will be reported as the difference between 100% and the percent DMA found.

4.5.3 Determination of Total Arsenic. Dissolve 0.2 gms of herbicide with 10 ml HNO_3 (1 + 4) in an evaporating dish. Add 5 ml concentrated H_2SO_4 and heat on a hot plate until dense white fumes of SO_3 just appear in the flask. Cool, add 10 ml distilled water and again evaporate until SO_3 fumes appear. Complete removal of HNO_3 is indicated by clarity of the solution and absence of brownish fumes. Carefully transfer into a 250-ml Erlenmeyer flask. Let cool and dilute to approximately 100 ml final volume. Add 1 gm KI and boil until volume is reduced to 40 ml. Cool, dilute to 100 ml. Add 0.05 N sodium thiosulfate dropwise until iodine color is removed. Neutralize with 6 N NaOH. Add 4 gms NaHCO_3 and titrate with 0.1 N iodine until yellow color disappears. Add 5 ml starch indicator and continue titration to a permanent blue color.

4.5.3.1 Calculation.

$$\% \text{ As} = \frac{(\text{ml } \text{I}_2)(\text{N of } \text{I}_2)(0.03746)(100)}{\text{Wt. Sample}}$$

4.5.4 Determination of pH Value. 2.5 gms of herbicide shall be dissolved in 100 ml CO_2 -free distilled water and the pH determined at 25°C ., using a pH meter.

4.5.5 Appearance and Pour. Measure 50 ml of the dry herbicide into a glass cylinder seven inches high by 7/8 inch in diameter and equipped with a spout. By tilting the cylinder pour the herbicide at a uniform rate of approximately 100 ml per minute. Observe the appearance of the herbicide in the cylinder and the pouring for conformance to 3.3.

4.6 Inspection of Preparation for Delivery. The packaging, packing and marking of the herbicide shall be inspected to determine conformance to the requirements of Section 5 of this specification.

5. PREPARATION FOR DELIVERY

For civilian procurement, the definitions and applications of the levels of packaging and packing shall be in accordance with Fed Std No. 102.

5.1 Packaging/Packing. Packaging/packing shall be level A or C, as specified (see 6.2).

5.1.1 Level A. The herbicide shall be packaged/packed in 50 or 100 lb quantities in fiber drums conforming to Federal Specification PPP-D-723, Type II, Grade A, or textile laminated bags conforming to Federal Specification PPP-B-35, Number P35B, as specified (see 6.2).

5.1.2 Level C. The herbicide shall be packaged/packed in a manner which will insure arrival at destination in satisfactory condition and which will be acceptable to the carrier at lowest rates. Containers and packing shall comply with Uniform Freight Classification Rules, or with rules and regulations of other carriers as applicable to the mode of transportation.

5.2 Marking.

5.2.1 The labeling shall be registered under the Federal Insecticide, Fungicide and Rodenticide Act of 1947, as amended, and in compliance with its requirements. The label data shall be durably and legibly marked in accordance with MIL-STD-129 on the main panel of the body by lithographing, stenciling or printing with a yellow, non-corrosive, weather-resistant, waterproof ink conforming to TT-I-558. Labels shall be securely affixed in place, with water-resistant label adhesive as specified in MIL-A-3941 and shall be water-proofed by coating the entire surface of the label with the same adhesive.

5.2.2 Directions for Use. The following directions for use shall be included on each herbicide containers:

DIRECTIONS FOR USE

Spray as soon as seedlings of crabgrass or Dallis grass are one to two inches high. Two or more applications are usually required at 7-10 day intervals between sprayings. If older plants are not killed or if new crabgrass or Dallis grass appears, repeat with one to two more additional sprayings. For best results treat early, apply accurately and do not apply during hot, dry spells unless grass is thoroughly watered. Grass roots should be watered daily after spraying, but do not soak. If moist from rain, grass need not be watered. DO NOT APPLY TO DRY TURF DURING HOT DRY SPELLS. RESTORE SOIL MOISTURE BY WATERING TURF WELL FOR A PERIOD OF TIME PRIOR TO SPRAYING.

YOUNG SEEDLINGS: Mix one-half pound with 20 gallons of water and apply to 4000 square feet.

MATURE CRABGRASS OR DALLIS GRASS: Mix one-half pound with 20 gallons of water and apply to 2000-3000 square feet.

C A U T I O N

DO NOT APPLY TO BERMUDA GRASS INTENDED TO BE FED TO LIVESTOCK.

5.2.3 Civilian Agencies. In addition to labeling specified in 5.2.1 and any special marking required by the contract or order, shipping containers shall be marked in accordance with Fed Std No. 123.

5.2.4 Military Requirements. In addition to labeling specified in 5.2.1 and any special marking required by the contract or order, shipping containers shall be marked in accordance with MIL-STD-129.

6. NOTES

6.1 Intended Use. Disodium methanearsonate is intended for use as a selective crabgrass killer at recommended rates of application in the presence of Kentucky, Merion Blue, Bermudas and Zoysia grasses. It will also control Dallis grass in the presence of Bermuda and Zoysia grasses and several undesired grasses (Johnson, water, goose and nut grasses), cocklebur and annual morning glory in the presence of cotton. Turf areas to be treated with this product include lawns, athletic fields, golf courses and parks.

6.2 Ordering Data. Procurement documents should specify the following:

- a. Title, Number and Date of this specification.
- b. Inspection Responsibility, Methods and Tests (see Section 4).
- c. Selection of applicable levels of packaging and packing required (see 5.1 and 5.2).

6.3 The Federal Insecticide, Fungicide and Rodenticide Act of 1947 is under the jurisdiction of the Pesticides Regulation Section, Plant Pest Control Branch, Agricultural Research Service, U.S. Department of Agriculture, Washington 25, D.C., to which agency all matters pertaining to registration should be addressed.

Custodians:

Army - MU
Navy - YD
Air Force - 68

Preparing Activity:

Air Force - 68
Project Number 6840-0082

Review Activities:

Army - MU
Navy - YD
Air Force - 68

SPECIFICATION ANALYSIS SHEET

Form Approved
Budget Bureau No. 119-R004

INSTRUCTIONS

This sheet is to be filled out by personnel either Government or contractor, involved in the use of the specification in procurement of products for ultimate use by the Department of Defense. This sheet is provided for obtaining information on the use of this specification which will insure that suitable products can be procured with a minimum amount of delay and at the least cost. Comments and the return of this form will be appreciated. Fold on lines on reverse side, staple in corner, and send to preparing activity (as indicated on reverse hereof).

SPECIFICATION

ORGANIZATION (Of submitter)		CITY AND STATE
CONTRACT NO.	QUANTITY OF ITEMS PROCURED	DOLLAR AMOUNT \$

MATERIAL PROCURED UNDER A

DIRECT GOVERNMENT CONTRACT SUBCONTRACT

1. HAS ANY PART OF THE SPECIFICATION CREATED PROBLEMS OR REQUIRED INTERPRETATION IN PROCUREMENT USE?
A. GIVE PARAGRAPH NUMBER AND WORDING.

B. RECOMMENDATIONS FOR CORRECTING THE DEFICIENCIES.

2. COMMENTS ON ANY SPECIFICATION REQUIREMENT CONSIDERED TOO RIGID

3. IS THE SPECIFICATION RESTRICTIVE?
 YES NO IF "YES", IN WHAT WAY?

4. REMARKS (Attach any pertinent data which may be of use in improving this specification. If there are additional papers, attach to form and place both in an envelope addressed to preparing activity)

SUBMITTED BY (Printed or typed name and activity)	DATE
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