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**Item ID Number** 04212

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**Author**

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**Report/Article Title** Sales Specification Forms and Notes Describing  
Herbicide Orange

**Journal/Book Title**

**Year** 0000

**Month/Day**

**Color**

**Number of Images** 5

**Description Notes**

Barry Byrd requested that these be sent  
to you.

# SALES SPECIFICATION

AGRICULTURAL PRODUCTS



THE DOW CHEMICAL COMPANY  
AGRICULTURAL PRODUCTS DEPARTMENT  
MIDLAND, MICHIGAN 48640

| SPECIFICATION |          | SUPERSEDES |         | METHOD OF ANALYSIS |
|---------------|----------|------------|---------|--------------------|
| NUMBER        | DATE     | NUMBER     | DATE    |                    |
| 21315         | 11/17/69 | 21315      | 7/15/69 | 20706              |

## 2, 4-DICHLOROPHENOXYACETIC ACID, BUTYL ESTERS

|  |        |
|--|--------|
| 2, 4-Dichlorophenoxyacetic acid, butyl esters, minimum | 98.8 % |
| 2, 4-Dichlorophenoxyacetic acid equivalent, minimum    | 78.8 % |
| Acidity as 2, 4-dichlorophenoxyacetic acid, maximum    | 0.25 % |

*11/17/69*

*4.26*

*11/17/69*



*5.06*

*Handwritten notes and signatures*

# SALES SPECIFICATION

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MIDLAND, MICHIGAN 48640

| SPECIFICATION |         | SUPERSEDES |         | METHOD OF ANALYSIS |
|---------------|---------|------------|---------|--------------------|
| NUMBER        | DATE    | NUMBER     | DATE    |                    |
| 87554         | 3/31/69 | 29019      | 2/28/60 | 87554a             |

## 2, 4, 5-TRICHLOROPHENOXYACETIC ACID, BUTYL ESTERS

|  |       |
|--|-------|
| 2, 4, 5-Trichlorophenoxyacetic acid, butyl esters<br>minimum | 97.5% |
| 2, 4, 5-Trichlorophenoxyacetic acid equivalent,<br>minimum   | 80.0% |
| Acidity as 2, 4, 5-Trichlorophenoxyacetic acid,<br>maximum   | 2.0%  |

## Description of Orange

Orange consists of a 50-50 ~~weight~~ mixture (volume/volume) of 2,4-D and 2,4,5-T.

2,4-D theoretically makes up 48.5% weight of a gallon of Orange. The purity of 2,4-D is 99%. Thus,  $48.5\% \times 99\% = 48\%$  Technical 2,4-D. The acid equivalent of 2,4-D is 78.8%. Therefore,  $48 \times 78.8\% = 37.8\%$

The specific gravity of Orange ranges from 1.275 - 1.295 while the weight of Orange per gallon is 10.75 pounds.

$$\therefore 37.8 \times 10.75 = 4.045 \text{ 2,4-D acid equiv.}$$

2,4,5-T makes up 51.5% by weight. The purity of 2,4,5-T was 97.5% and thus  $97.5\% \times 51.5\% = 50.2\%$  Technical ester. The acid equivalent of 2,4,5-T is 80%.

$$\text{Thus } 80 \times 50.2 = 40.2\%$$

$$40.2 \times 10.75 = 4.30 \text{ lb/gal.}$$

$$4.30 + 4.05 = 8.35 \text{ lb ai/gallon}$$

Orange contains a small percentage of butyl alcohol & butyl ester moiety.

$$2,4-D \text{ } 0.25\% \text{ free acid} = 0.268 \text{ lb ai}$$

$$2,4,5-T \text{ Free Acid} = 2.150 \text{ lb ai}$$

$$2,4-D \text{ as from Esters} = 4.1847$$

$$2,4,5-T \text{ " " " " } = 4.1925$$

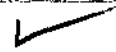
$$\underline{8.6190}$$

ACTIVE INGREDIENT

$$2,4,5-T = 4.4075$$

$$2,4-D = 4.2115$$

$$\underline{8.6190}$$



### MAXIMUM POSSIBLE VALUE

$$2,4,5-T = 4.300$$

$$\text{" acid} = 0.215*$$

$$2,4-D = 4.336$$

$$\text{" acid} = \underline{0.027*}$$

$$\text{Total} = 8.778$$