The Ohio State University

Trial ID: 18MALTSP Location: Western Branch F-9 W Trial Year: 2018
Protocol ID: 18MALT Investigator: Dr. Mark M. Loux
Project ID: Study Director:
Sponsor Contact:

## General Trial Information

**Investigator:** Dr. Mark M. Loux

## Trial Location

**City:** South Charleston **Country:** USA United States
**State/Prov.:** Ohio
**Postal Code:** 45368 **Climate Zone:** USWARM US Warm Continental

**Latitude of LL Corner °:** 39.85888 N
**Longitude of LL Corner °:** 83.67365 W
**Altitude of LL Corner, Unit:** 1089.00 FT

**Conducted Under GLP:** No
**Conducted Under GEP:** No

**Investigator:** Dr. Mark M. Loux

## Crop Description

**Crop 1:** HORVW Hordeum vulgare Winter barley
**Variety:** Thoroughbred **BBCH Scale:** BCER
**Description:** Ohio Certified Seed

**Planting Date:** Oct-2-2017
**Planting Method:** DRILLE drilled
**Planting Rate, Unit:** 100 LB/A **Planting Equipment:** DD Disc Drill
**Depth, Unit:** 0.5 IN **Emergence Date:** Oct-7-2017
**Row Spacing, Unit:** 7.5 IN **Harvest Date:** Jun-19-2018
**Harvested Width, Unit:** 6.25 FT
**Harvested Length, Unit:** 30 FT
**Harvest Equipment:** Massey 8 XP
**Soil Temperature, Unit:** 65 F **% Standard Moisture:** 13.5
**Soil Moisture:** DRY dry **Moisture Meter:** Mirrus by Havest Master
**Seed Bed:** MEDTRA medium/trashy **Weighing Equipment:** Mirrus by Harvest Master

## Pest Description

**Pest 1 Type:** W **Code:** STEME Stellaria media
**Common Name:** Common chickweed

**Pest 2 Type:** W **Code:** LAMPU Lamium purpureum
**Common Name:** Purple deadnettle

**Pest 3 Type:** W **Code:** ERYRE Erysimum repandum
**Common Name:** Bushy wallflower

**Pest 4 Type:** W **Code:** AMBTR Ambrosia trifida
**Common Name:** Giant ragweed

## Site and Design

**Treated Plot Width:** 10 FT **Site Type:** FIELD field
**Treated Plot Length:** 30 FT **Experimental Unit:** 1 PLOT plot
**Treated Plot Area:** 300 FT2 **Treatments:** 16 **Tillage Type:** CONTIL conventional-till
**Replications:** 3 **Study Design:** RACOBL Randomized Complete Block (RCB)

**No. Previous Crop Year**
**1.** Wheat 2017

**Field Prep./Maintenance:**
20 gallons of 28% urea applied 4-12-18

## Soil Description

**Description Name:** F-9 West
**% Sand:** 32 **% OM:** 1.6 **Texture:** SICL silty clay loam
**% Silt:** 53 **pH:** 6 **Soil Name:** Crosby
**% Clay:** 15 **CEC:** 8.6 **Fert. Level:** G good
**Soil Drainage:** G good

**Analyzed By:**
Spectrum Anayltic, Washington Court House, OH 11-27-2017

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## Application Description

| | A |
|---|---|
| **Application Date:** | May-8-2018 |
| **Appl. Start Time:** | 10:00 AM |
| **Appl. Stop Time:** | 10:20 AM |
| **Application Method:** | SPRAY |
| **Application Timing:** | POST |
| **Application Placement:** | BROFOL |
| **Applied By:** | REEB |
| **Air Temperature, Unit:** | 63 F |
| **% Relative Humidity:** | 61 |
| **Wind Velocity, Unit:** | 2.5 MPH |
| **Wind Direction:** | NW |
| **Dew Presence (Y/N):** | Y yes |
| **Soil Temperature, Unit:** | 58 F |
| **Soil Moisture:** | SLIWET |
| **% Cloud Cover:** | 25 |
| **Next Moisture Occurred On:** | May-10-2018 |
| **Time to Next Moisture, Unit:** | 2 DAY |
| **Moisture 1 Week after Appl.:** | 0.25 IN |

## Crop Stage At Each Application

| | A |
|---|---|
| **Crop 1 Code, BBCH Scale:** | HORVW BCER |
| **Stage Scale Used:** | FEEKES |
| **Stage Majority, Percent:** | 10.0 100 |
| **Height, Unit:** | 20.4 IN |
| **Height Minimum, Maximum:** | 15 24 |

## Pest Stage At Each Application

| | A |
|---|---|
| **Pest 1 Code, Type, Scale:** | STEME W |
| **Stage Majority, Percent:** | 65 100 |
| **Diameter, Unit:** | 5 IN |
| **Height, Unit:** | 7 IN |
| **Height Minimum, Maximum:** | 3 10 |
| **Density, Unit:** | 3 M2 |
| **Pest 2 Code, Type, Scale:** | LAMPU W |
| **Stage Majority, Percent:** | 65 100 |
| **Diameter, Unit:** | 2 IN |
| **Height, Unit:** | 8 IN |
| **Height Minimum, Maximum:** | 4 14.5 |
| **Density, Unit:** | 0.33 M2 |
| **Pest 3 Code, Type, Scale:** | ERYRE W |
| **Stage Majority, Percent:** | 65 100 |
| **Diameter, Unit:** | 4.5 IN |
| **Height, Unit:** | 14 IN |
| **Height Minimum, Maximum:** | 10 18 |
| **Density, Unit:** | 0.33 M2 |
| **Pest 4 Code, Type, Scale:** | AMBTR W |
| **Stage Majority, Percent:** | 14 100 |
| **Diameter, Unit:** | 3 IN |
| **Height, Unit:** | 4 IN |
| **Height Minimum, Maximum:** | 3.5 5.5 |
| **Density, Unit:** | 0.33 m2 |

## Application Equipment

| | A |
|---|---|
| **Appl. Equipment:** | 10' AI XR |
| **Equipment Type:** | SPRBAC |
| **Operation Pressure, Unit:** | 46 PSI |
| **Nozzle Type:** | AI XR |
| **Nozzle Size:** | 110015 |
| **Nozzle Spacing, Unit:** | 18 IN |
| **Boom Length, Unit:** | 10 FT |
| **Boom Height, Unit:** | 20 IN |
| **Ground Speed, Unit:** | 3 MPH |
| **Carrier:** | WATER |
| **Spray Volume, Unit:** | 15 GPA |
| **Mix Size, Unit:** | 2 L |
| **Propellant:** | CO2 |

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| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Pest Type | | | | | | | | | | |
| Pest Code | | | | | | | | | | |
| Pest Scientific Name | | | | | | | | | | |
| Pest Name | | | | | | | | | | |
| Crop Code | | | | | HORVW | | HORVW | | HORVW | HORVW |
| BBCH Scale | | | | | BCER | | BCER | | BCER | BCER |
| Crop Scientific Name | | | | | Hordeum vulgare | | Hordeum vulgare | | Hordeum vulgare | Hordeum vulgare |
| Crop Name | | | | | Winter barley | | Winter barley | | Winter barley | Winter barley |
| Rating Date | | | | | Jun-19-2018 | | Jun-19-2018 | | Jun-19-2018 | Jun-19-2018 |
| Rating Type | | | | | WEIGHT | | MOICON | | YIELD | WEITES |
| Rating Unit | | | | | LBS | | % | | BU | LBS |
| Sample Size, Unit | | | | | 1 PLOT | | | | 1 A | |
| Number of Subsamples | | | | | 1 | | 1 | | 1 | 1 |
| Days After First/Last Applic. | | | | | 42 42 | | 42 42 | | 42 42 | 42 42 |
| Trt-Eval Interval | | | | | 42 DA-A | | 42 DA-A | | 42 DA-A | 42 DA-A |
| Plant-Eval Interval | | | | | 260 DP-1 | | 260 DP-1 | | 260 DP-1 | 260 DP-1 |
| Days After Emergence | | | | | 255 DE-1 | | 255 DE-1 | | 255 DE-1 | 255 DE-1 |
| ARM Action Codes | | | | | | | | | TY1 | |
| Number of Decimals | | | | | 1 | | 1 | | 1 | 1 |

| Trt No. | Treatment Name | Other Rate | Other Rate Unit | Appl Code | 7* | 8* | 9* | 10* |
|---|---|---|---|---|---|---|---|---|
| 1 | 2,4-D Ester | 1 | pt/a | A | 6.8 abc | 13.1 bcd | 32.9 abc | 43.0 ab |
| 2 | 2,4-D Ester | 1 | pt/a | A | 5.7 cd | 11.5 de | 27.7 cd | 40.1 fg |
| 2 | Clarity | 4 | oz/a | A | | | | |
| 3 | 2,4-D Ester | 1 | pt/a | A | 7.1 ab | 13.9 abc | 34.2 ab | 42.3 bcd |
| 3 | Harmon Extra TotalSol | 0.6 | oz/a | A | | | | |
| 3 | Harmony GT | 0.4 | oz/a | A | | | | |
| 3 | Express | 0.2 | oz/a | A | | | | |
| 3 | NIS | 0.25 | % v/v | A | | | | |
| 4 | Clarity | 4 | oz/a | A | 5.8 cd | 11.4 de | 28.2 cd | 40.0 fg |
| 4 | Harmon Extra TotalSol | 0.6 | oz/a | A | | | | |
| 4 | NIS | 0.25 | % v/v | A | | | | |
| 5 | Huskie | 13.5 | oz/a | A | 7.3 ab | 13.7 abc | 35.2 ab | 43.3 a |
| 5 | NIS | 0.25 | % v/v | A | | | | |
| 5 | N Pak AMS | 2.5 | % v/v | A | | | | |
| 6 | Quelex | 0.75 | oz/a | A | 7.0 ab | 13.0 bcd | 34.0 ab | 42.6 abc |
| 6 | NIS | 0.25 | % v/v | A | | | | |
| 7 | 2,4-D Ester | 1 | pt/a | A | 7.8 a | 14.1 ab | 38.0 a | 42.3 bcd |
| 7 | Quelex | 0.75 | oz/a | A | | | | |
| 7 | NIS | 0.25 | % v/v | A | | | | |
| 8 | Clarity | 4 | oz/a | A | 6.2 bcd | 11.4 de | 29.8 bcd | 40.1 fg |
| 8 | Quelex | 0.75 | oz/a | A | | | | |
| 8 | NIS | 0.25 | % v/v | A | | | | |
| 9 | Axial Star | | | A | 7.3 ab | 13.0 bcd | 35.3 ab | 41.5 de |
| 10 | Axial Star | | | A | 6.3 bcd | 12.8 bcd | 30.6 bcd | 41.9 cd |
| 10 | 2,4-D Ester | 1 | pt/a | A | | | | |
| 11 | Curtail 1.5 pt. | 1.5 | pt/a | A | 7.0 ab | 13.9 abc | 34.1 ab | 42.2 bcd |
| 11 | stinger | 2.13 | oz/a | A | | | | |
| 11 | 2,4-D Amine | 12.5 | oz/a | A | | | | |
| 12 | Buctril | 1 | pt/a | A | 7.1 ab | 15.1 a | 34.1 ab | 42.9 ab |

Means followed by same letter or symbol do not significantly differ (P=.05, LSD)
Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.
Due to missing data, larger LSD values (col. 7: >=1.13 and <=1.39) are used for mean comparisons of treatment pairs with missing data.
* Adjusted means

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| Trt No. | Treatment Name | Other Rate | Other Rate Unit | Appl Code | 7* | 8* | 9* | 10* |
|---|---|---|---|---|---|---|---|---|
| | Pest Type | | | | | | | |
| | Pest Code | | | | | | | |
| | Pest Scientific Name | | | | | | | |
| | Pest Name | | | | | | | |
| | Crop Code | | | | HORVW | HORVW | HORVW | HORVW |
| | BBCH Scale | | | | BCER | BCER | BCER | BCER |
| | Crop Scientific Name | | | | Hordeum vulgare | Hordeum vulgare | Hordeum vulgare | Hordeum vulgare |
| | Crop Name | | | | Winter barley | Winter barley | Winter barley | Winter barley |
| | Rating Date | | | | Jun-19-2018 | Jun-19-2018 | Jun-19-2018 | Jun-19-2018 |
| | Rating Type | | | | WEIGHT | MOICON | YIELD | WEITES |
| | Rating Unit | | | | LBS | % | BU | LBS |
| | Sample Size, Unit | | | | 1 PLOT | | 1 A | |
| | Number of Subsamples | | | | 1 | 1 | 1 | 1 |
| | Days After First/Last Applic. | | | | 42 42 | 42 42 | 42 42 | 42 42 |
| | Trt-Eval Interval | | | | 42 DA-A | 42 DA-A | 42 DA-A | 42 DA-A |
| | Plant-Eval Interval | | | | 260 DP-1 | 260 DP-1 | 260 DP-1 | 260 DP-1 |
| | Days After Emergence | | | | 255 DE-1 | 255 DE-1 | 255 DE-1 | 255 DE-1 |
| | ARM Action Codes | | | | | | TY1 | |
| | Number of Decimals | | | | 1 | 1 | 1 | 1 |
| 13 | Buctril | 1 | pt/a | A | 7.1 ab | 13.5 abc | 34.3 ab | 42.4 abc |
| 13 | Harmon Extra TotalSol | 0.6 | oz/a | A | | | | |
| 13 | NIS | 0.25 | % v/v | A | | | | |
| 14 | Powerflex | 3.5 | oz/a | A | 6.4 bcd | 12.5 cde | 31.0 bcd | 40.8 ef |
| 14 | NIS | | | A | | | | |
| 15 | Powerflex | 3.48 | oz/a | A | 6.8 abc | 12.5 b-e | 32.9 abc | 40.8 ef |
| 15 | 2,4-D Ester | 1 | pt/a | A | | | | |
| 15 | NIS | | | A | | | | |
| 16 | Powerflex | 3.48 | oz/a | A | 5.3 d | 11.0 e | 25.7 d | 39.8 g |
| 16 | Clarity | 4 | oz/a | A | | | | |
| 16 | NIS | | | A | | | | |
| | LSD P=.05 | | | | 1.13 | 1.53 | 5.48 | 0.79 |
| | Standard Deviation | | | | 0.67 | 0.91 | 3.26 | 0.46 |
| | CV | | | | 11.01 | 7.14 | 11.01 | 1.12 |
| | Levene's F | | | | 0.539 | 0.472 | 0.539 | 0.323 |
| | Levene's Prob(F) | | | | 0.898 | 0.938 | 0.898 | 0.988 |
| | Skewness | | | | -0.5953 | -0.0234 | -0.5953 | -0.5579 |
| | Kurtosis | | | | -0.002 | 0.6723 | -0.002 | -0.5074 |
| | Randomized Complete Block (RCB) AIC | | | | 127.7781 | 151.3984 | 276.0081 | 125.236 |
| | Spatial AIC | | | | SPa 112.5359 | SPa 140.8542 | SPa 260.7659 | SPb 77.6491 |
| | Analyzed as | | | | CRD+SPa | CRD+SPa | CRD+SPa | CRD+SPb |
| | Replicate F | | | | 11.583 | 5.431 | 11.583 | 147.120 |
| | Replicate Prob(F) | | | | 0.0003 | 0.0107 | 0.0003 | 0.0001 |
| | Treatment F | | | | 3.775 | 3.750 | 3.775 | 13.130 |
| | Treatment Prob(F) | | | | 0.0015 | 0.0016 | 0.0015 | 0.0001 |

Crop Code
HORVW, BCER, Hordeum vulgare, Winter barley = US
Rating Type
WEIGHT = weight
MOICON = moisture content
YIELD = yield
WEITES = weight - test
Rating Unit
% = percent
BU = bushel

PLOT = total plot
A = acre
Plant-Eval Interval
260 DP-1 = 1 HORVW Oct-2-2017
ARM Action Codes
TY1 = 4.84*[7]

Means followed by same letter or symbol do not significantly differ (P=.05, LSD)
Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.
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* Adjusted means

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SPa = Quadratic spatial trend
SPb = Cubic spatial trend

Means followed by same letter or symbol do not significantly differ (P=.05, LSD)
Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.
Due to missing data, larger LSD values (col. 7: >=1.13 and <=1.39) are used for mean comparisons of treatment pairs with missing data.
* Adjusted means