‘Covington’ Sweetpotato Tolerance to Dual Magnum Applications Followed by Simulated Rainfall

S.L. Meyers, K.M. Jennings, D.W. Monks

MS State Univ.- Extension Service, Pontotoc, MS
Dept. of Horticultural Science, NC State Univ., Raleigh, NC
Palmer Amaranth Control

- Weedy Check 20 DAP
- S-metolachlor 0.75 pt/A 20 DAP
- Weedy Check 107 DAP
- S-metolachlor 0.75 pt/A 107 DAP
‘Covington’ Length to Width Ratio

Non-treated

1 pt/A, 1 DAP

2 pt/A, 1 DAP

3 pt/A, 1 DAP
‘Covington’ Length to Width Ratio

Non-treated

1 pt/A, 14 DAP

2 pt/A, 14 DAP

3 pt/A, 14 DAP
Objective

• Determine the response of ‘Covington’ sweetpotato to S-metolachlor rate and application time- when application is followed by a simulated rainfall event.
  – What happens between “immediately after transplanting” and 14 days after transplanting?
Materials and Methods

- Horticultural Crops Research Station
  - Clinton, NC
    - sandy loam
      - <1% OM, pH 5.8-6.0
    - 2011 and 2012
- Variety
  - ‘Covington’
Materials and Methods

• Plot size: 2 rows 18’ long, 42” apart
• Planted: June 15, 2011; June 13, 2012
• RCBD with 4 replications
• Application information:
  – 8003 XR nozzles
  – 20 gal/a 18 psi
Materials and Methods

- Treatments:
  - 4 x 6 factorial
    - Four Dual Magnum rates: 0, 1, 2, 3 pt/a
    - Six application times: 0, 2, 5, 7, 9, 14 DAP
  - Immediately following application individual treated plots received 0.75” of simulated rainfall.
  - Plots maintained weed free by hand removing emerged weeds weekly.
Rainfall Simulator
Data Collection

• **Crop injury**
  - 0 (no injury) to 100% (crop death)

• **Yield**
  - Jumbo, no.1, and canner (USDA 2005)
  - Total marketable = sum of jumbo, no. 1, and canner

• **No. 1 root length to width ratio**
  - 20 No. 1 roots per plot
Sweetpotato Root Length to Width Ratio

• **Length**
  • “The dimension of the sweetpotato, measured in a straight line between points at or near each end of the sweetpotato where it is at least three-eighths inch in diameter.”

• **Width**
  • “The greatest dimension of the sweetpotato, measured at right angles to the longitudinal axis.”

- USDA 2005
Results
Foliar Sweetpotato Injury

- Injury was limited to minimal stunting ($\leq 10\%$).
- Transient and 0% by 27 DAP.
Sweetpotato Yield
Influence of Dual Magnum Rate on No. 1 Sweetpotato Yield

No. 1 yield = -1,483x + 22,370; $R^2 = 0.99$

Dual Magnum rate (pt/a)

No. 1 sweetpotato yield (lb/a)

21,258 lb/a
Influence of Dual Magnum Rate on Total Marketable Yield

Marketable sweetpotato yield (lb/a) vs. Dual Magnum rate (pt/a)

Mktbl yield = -1,496.9x^2 + 290.67x + 39,962; R^2 = 0.99

39,338 lb/a
Influence of Dual Magnum Time on No. 1 Sweetpotato Yield

No. 1 = 471.39x + 17,505; $R^2 = 0.88$
Influence of Dual Magnum Time on Total Marketable Yield

Marketable sweetpotato yield (lb/a) vs. Dual Magnum application time (d after transplanting)

Mktbl yield = 15.012x² + 296.87x + 33,631; $R^2 = 0.88$
Storage Root Length to Width Ratio
Influence of Dual Magnum Time on Root Length to Width Ratio (1 pt/a)

\[ y = 0.0007x^2 + 0.0161x + 1.8652 \]

\[ R^2 = 0.95 \]
Influence of Dual Magnum Time on Root Length to Width Ratio (2 pt/a)

\[ y = -0.0048x^2 + 0.1004x + 1.572 \]

\[ R^2 = 0.82 \]
Dual Magnum 1 pt (0 DAP)
Dual Magnum 1 pt
(2 DAP)
Dual Magnum 1 pt
(5 DAP)
Dual Magnum 1 pt
(7 DAP)
Dual Magnum 1 pt
(9DAP)
Dual Magnum 1 pt
(14 DAP)
Summary

• No. 1 and total sweetpotato yields
  – decreased as Dual Magnum rate increased from 0 to 3 pt/a and
  – increased as application time increased from 0 to 14 days after transplanting.

• Jumbo and canner yields did not correspond to treatment.
• Generally, sweetpotato storage root length to width ratio increased when Dual Magnum applications were delayed.
  – Length: width reached 2.0-6 to 7 days after transplanting.
Conclusions

• Predicted yield losses were minimal when Dual Magnum was applied at the recommended rate of 0.75 pt/a.
  – Injury would likely be negated by weed control provided by the herbicide. (This study was hand-weeded.)

• Delaying a Dual Magnum application reduces the risk of crop injury and misshapen storage roots.
Questions