### Introduction

- The recent development of Type II upright black beans allows for a one pass direct cut harvest.
- Preharvest-herbicide applications are used to desiccate green tissue and weeds that can interfere with direct harvest.
- Color retention of black beans has been a major concern for the canning industry and may be influenced by variety, planting date or outside factors.
- Preharvest herbicides can differ in their effectiveness, activity speed, and could potentially impact yield, seed quality, and color retention.

### Objective

- Evaluate the effects of preharvest treatments on the desiccation and yield of three black bean varieties for two different planting dates and application timings.

### Materials and Methods

#### Experiment design

- Field trials conducted at the Saginaw Valley Research and Extension Center near Richville, MI in 2013
- Two planting dates
  - June 13, 2013
  - June 26, 2013
- Split-split plot design, 4 replications
- Main plot: Three black (Type II) bean varieties
  - ‘Zorro’ – standard MI grown variety
  - ‘B10244’ – potential new MSU release
  - ‘Eclipse’ – standard ND and MN grown variety

#### Desiccation treatments

- Sub-plot: Two application timings
  - Early: 50% pod yellowing
  - Standard: 80% pod yellowing
- Sub-sub plot: Three herbicide treatments
  - Paraquat (0.56 kg ha⁻¹) + NIS (0.25% v/v)
  - Saflufenacil (0.05 kg ha⁻¹) + MSO (1% v/v) + AMS
  - Glyphosate (0.84 kg a.e. ha⁻¹) + AMS (2% w/w)

#### Data collection and analysis

- Desiccation evaluated 3, 7, and 14 DAT
- Yield was obtained through direct harvest
  - Yield was adjusted to 18% moisture
- Data were analyzed using PROC Mixed & ANOVA in SAS
- Means were separated with Fisher’s protected LSDₐ(0.05)

### Results and Discussion

#### Early Planted

- **Desiccation (3 DAT)**
  - Paraquat: A
  - Saflufenacil: BC
  - Glyphosate: CD
  - Untreated: E

- **Yield (kg/ha)**
  - Paraquat: A
  - Saflufenacil: BC
  - Glyphosate: CD
  - Untreated: E

#### Late Planted

- At the early application timing, saflufenacil provided the greatest desiccation at 3 and 7 DAT (Figure 4).
- Desiccation of black beans was slower with glyphosate and did not provide any advantage to dry down compared with the untreated 7 DAT for ‘Zorro’ and ‘B10244’ at the early application timing (Figure 4).
- All herbicide treatments applied at the standard timing provided excellent black bean desiccation (data not shown).
- Similar to the early planting, early applications of paraquat and saflufenacil resulted in lower yields.
- Overall yield was lowest for ‘Zorro’ in the second planting.

#### Conclusions

- All three preharvest herbicide treatments provided excellent desiccation when applied to dry beans that were at 80% yellow pod (standard).
- Early applications of paraquat and saflufenacil quickly desiccate dry beans which may lead to reductions in yield; however, this can vary by black bean variety.
- We are currently examining whether early preharvest herbicide applications are impact color retention of black beans after canning.

### Acknowledgements

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