

# Cultural methods for improving direct harvest efficiency in dry edible bean

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# Direct Harvest of Dry Bean

- ❁ Minimizing harvest loss:
  1. Equipment
  2. Field prep (& residue management)
  3. Variety selection



# Field Prep Options

## 1. Clean tilled

- soil surface must be smooth & level
- tillage followed by roller

## 2. Residue/cover crop

- plant into previous crop stubble (barley/wheat)
- must have drill that can deal with residue



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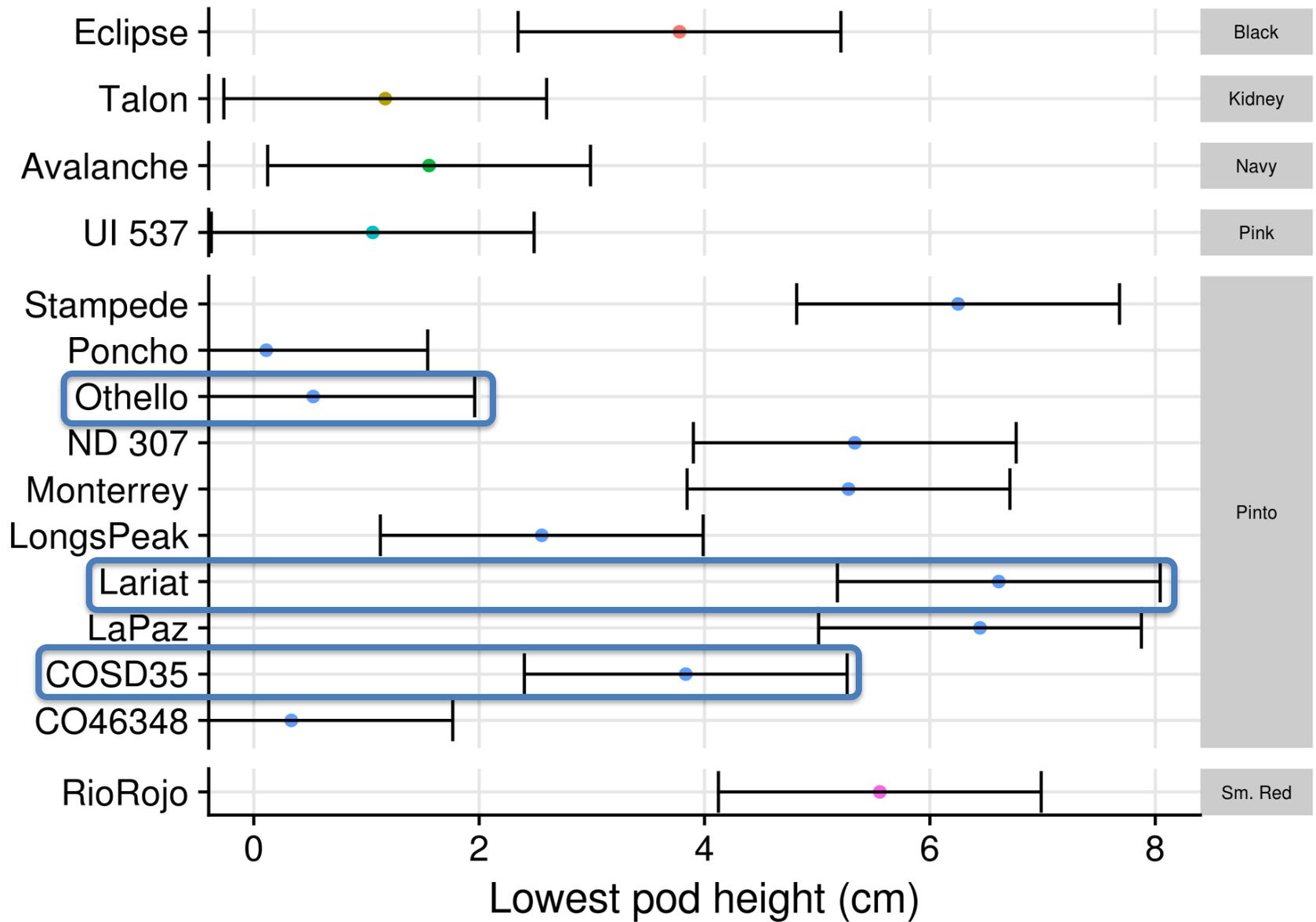
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# QUESTION:

How does bean variety interact with other components of the direct harvest/conservation tillage system?

**Are varieties that perform well under clean-till conditions also best in a stubble/cover crop system?**





# 2019 Experiment:

## Three bean varieties:

- 'Othello' (short)
- 'Staybright' (medium)
- 'Lariat' (tall)

## Cover termination timing:

- 14 days before planting
  - bare soil control
- 7 days before planting
- Day of planting
- 3 days after planting
- 7 days after planting
- 14 days after planting
- 21 days after planting



# 2019 Experiment:

## Three bean varieties:

- 'Othello' (short)
- 'Staybright' (medium)
- 'Lariat' (tall)

## Cover termination timing:

- 14 days before planting
  - bare soil control
- ~~7~~**8** days before planting
- Day of planting
- ~~3~~**4** days after planting
- ~~7~~**6** days after planting
- ~~14~~**12** days after planting
- ~~21~~**20** days after planting
- **26** days after planting





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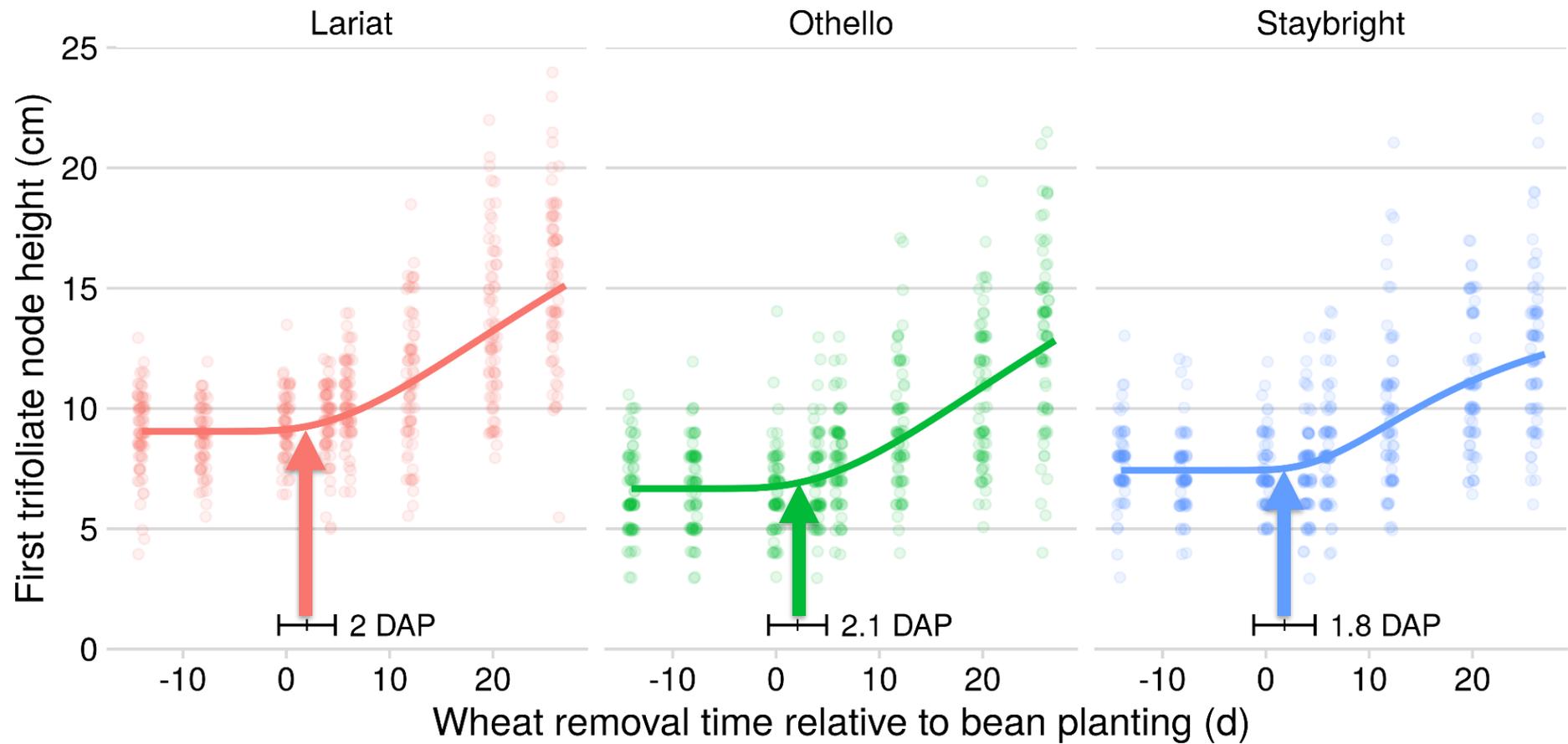
# 2019 Research Objectives:

- ❏ Evaluate **early-season node elongation** for dry bean varieties in response to presence or absence of a winter wheat cover crop.
- ❏ Measure **pod height at maturity** and evaluate whether early-season node heights predict bean pod height at maturity.
- ❏ **Determine the yield trade-offs** (if any) from early season node extension and cover crop termination timing.

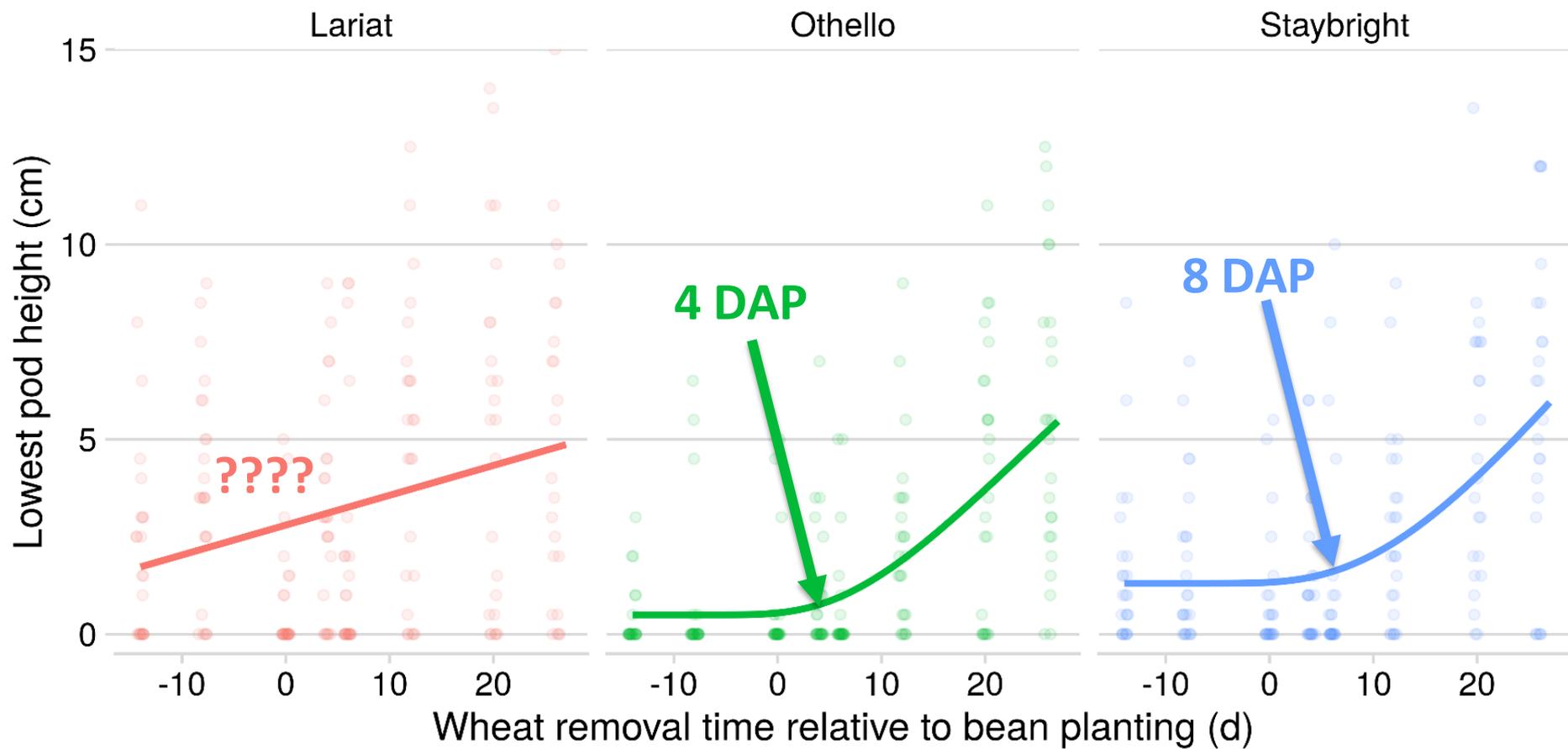




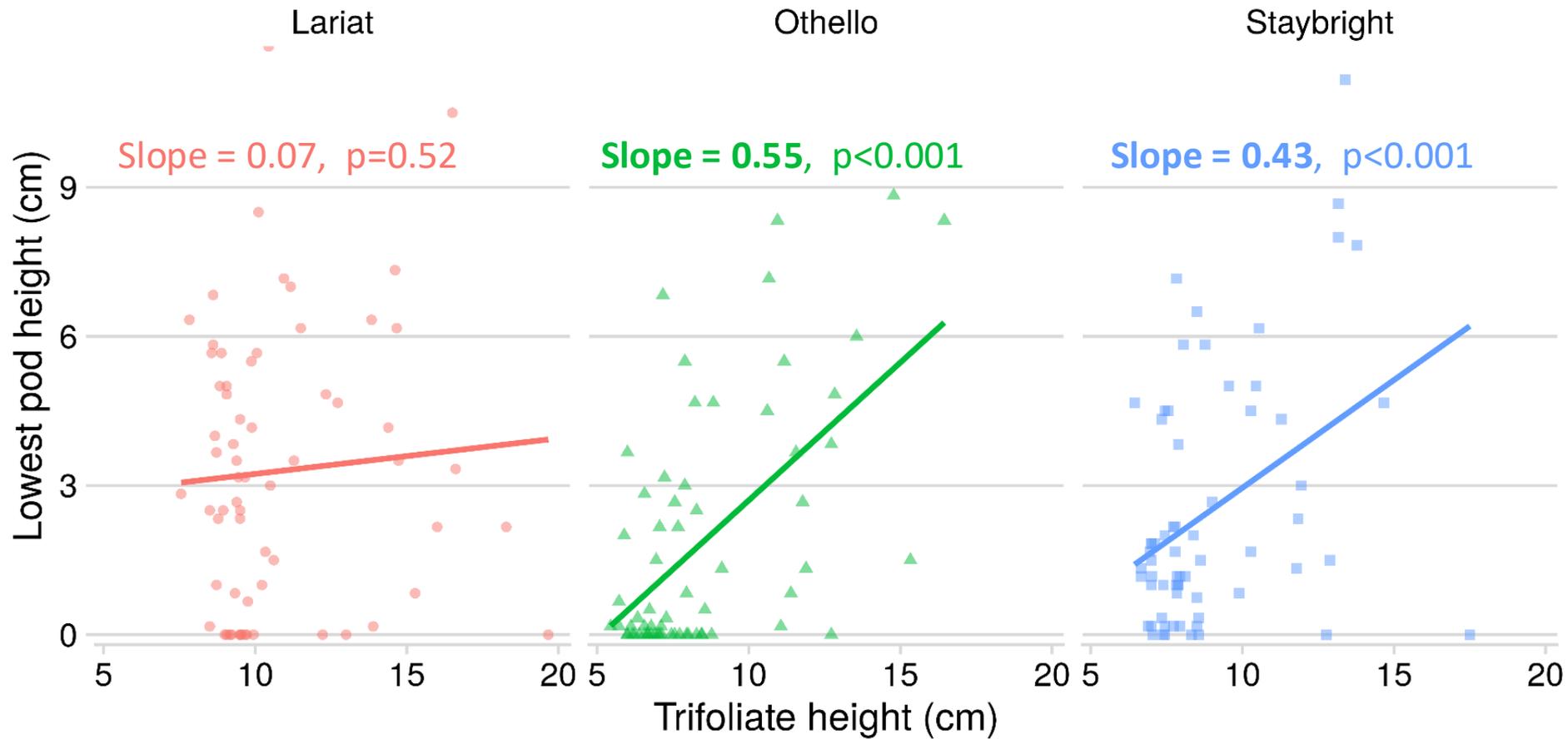
# First Trifoliolate Height



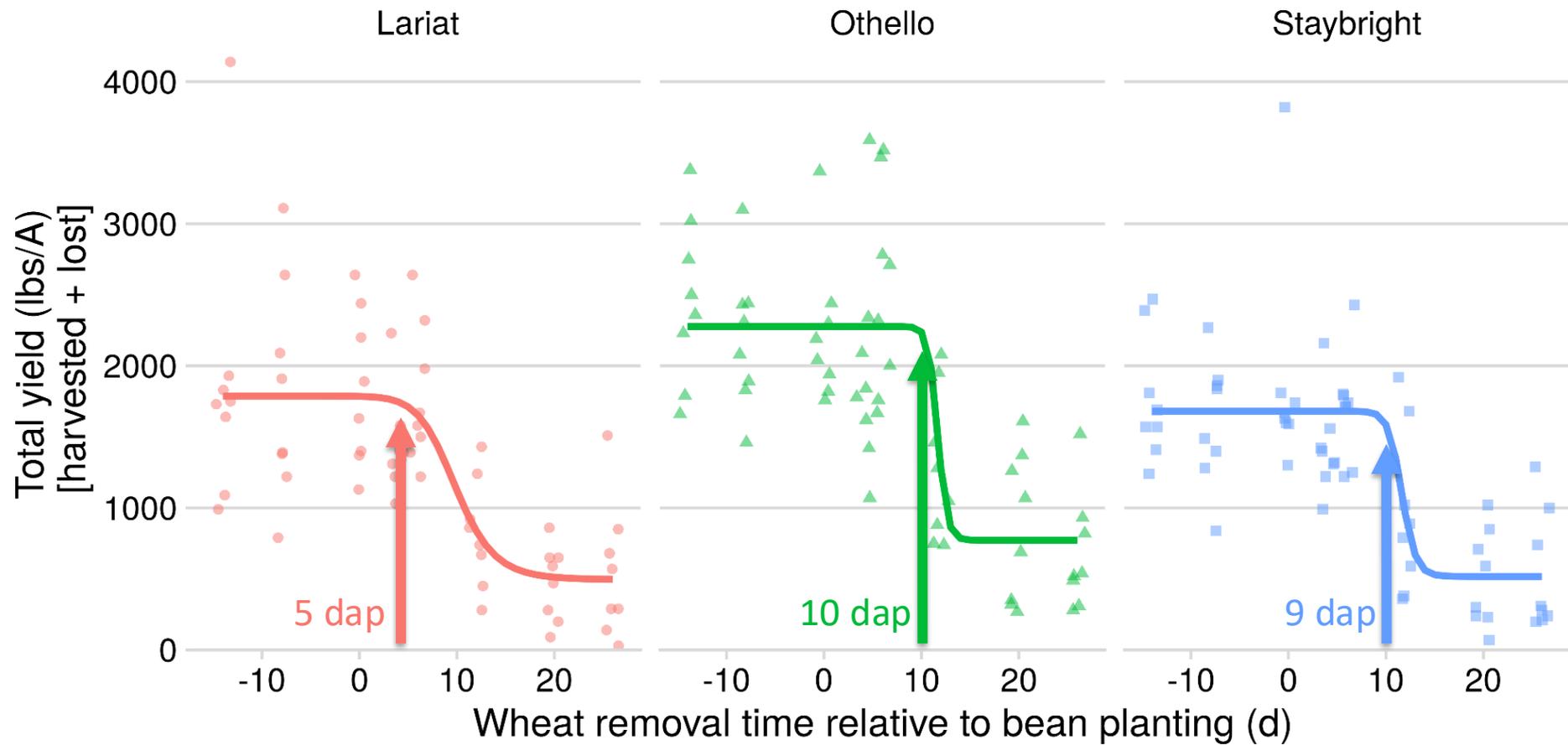
# Lowest Pod Height



# Node vs Pod Heights



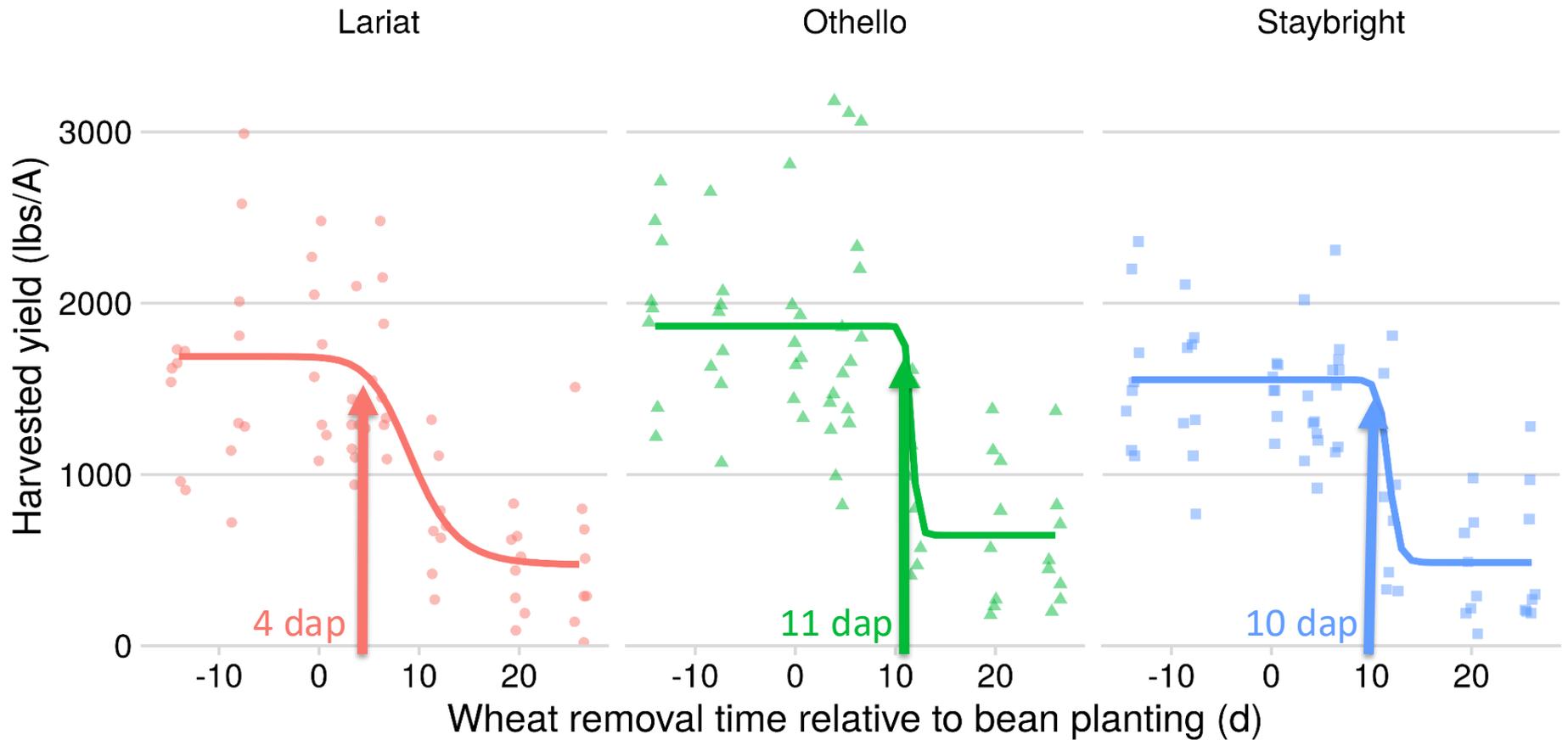
# Potential Yield (harvested + lost)



# Direct Harvest Loss (%)



# Harvested Yield



# Summary of 2019 Results:

- ❏ Winter wheat cover crop influenced bean growth if terminated 2 days after planting or later
- ❏ Pod height was correlated with early season node height for 2 of 3 varieties (not the tallest one)
- ❏ Wheat cover crop did not impact harvest loss
- ❏ Yield potential was more important than height...

# Dry Bean Yield

(before cover crop effects)

Variety	Total Yield (lbs/A)	Harvest Loss (%)	Harvested Yield (lbs/A)
Lariat (tall)	1,790	5.6	1,690
Othello (low)	2,280	18.0	1,870
Staybright (medium)	1,680	7.7	1,550

# 2020 Proposal:

- Repeat the study in 2020 to ensure results are representative
  - \$16,000 to fund Tyler Hicks's M.S. stipend



# Thank You!

## Funding for this research:

Wyoming Dry Bean Commission (2016-2017, 2019)

