Canola (*Brassica napus* L.) grain yield response to split Nitrogen

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Introduction

- Split application of N fertilizer is a recommended approach to enhance fertilizer use efficiency by crops. But the economic benefits need to outweigh the cost involved in order for producers to widely adopt the practice.
- Producers can cut down on top-dress N rates if mid-season potential yield is predicted to be low due to environmental or pest stress.
- When soil available N is too high beyond plant needs from high input at planting or as top-dress, yields decline can be expected especially under water stress during dry summer years.
- Therefore, applying N just when the plants need it the most, before bolting (at 5-leaf stage) of canola, and in the right amount, should be a farmer's goal.

Objectives

- Evaluate efficiency of split-applied N to canola at 4- to 5-leaf stage, versus single application
- Determine the rate at which split N application would best optimize yield and quality

Fig 1. Canola at full bloom.

Harvesting 7 days after swathing.

Swathing canola.

Canola seeds.

Materials and Methods

Table 1. N fertilizer treatments.

Fertilizer treatments	At planting (lbs/A)	At 5-leaf stage (lbs/A)
Urea (non-coated with Agrotain™ applied by broadcast)	0	0
	60	0
	105	0
	150	0
	0	90
	0	135
	0	150
	60	45
	60	90
	105	45
	105	75
Urea coated with Agrotain™ (U+AgT)	0	90
	0	135
	150	0
	45	90
	105	45

Results

Fig 2. Canola seed yield as a function of N applied as urea

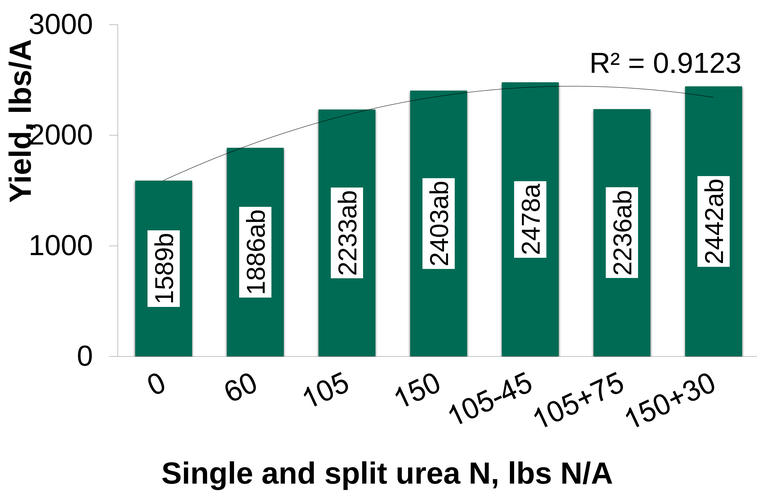


Fig 3. Relationship between grain yield and oil content of canola

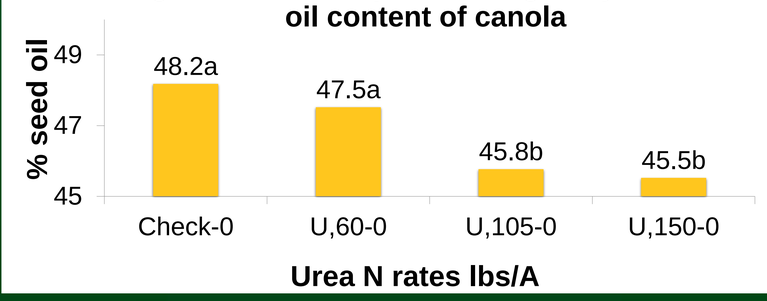


Fig 4. Canola yield response to split N as urea and Agrotain™-coated urea at 150 lbs N

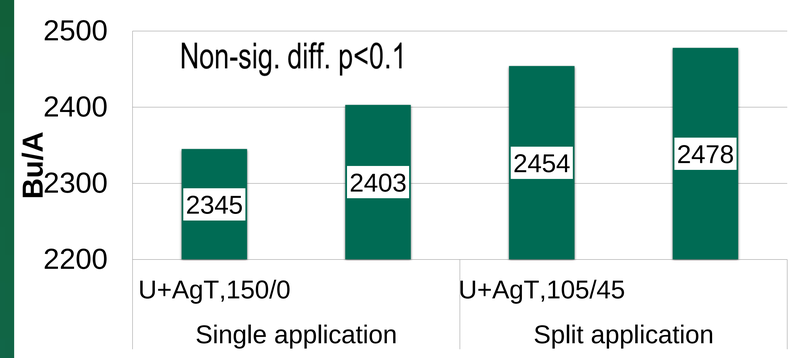
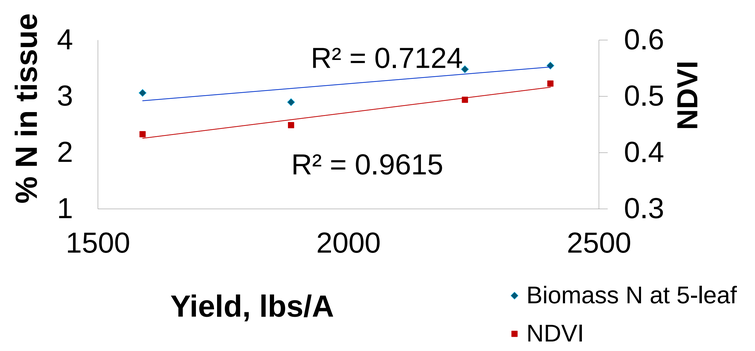


Fig 5. Relationship between canola seed yield and plant vigor (NDVI at 5-leaf) and tissue N content



Summary

- Significant differences (α<0.05) observed in mid-season plant vigor (NDVI) and tissue N did not translate to significant differences in yields at harvest; probably from the effects of drought stress from late June to August.
- Seed yields from urea treatments were higher than with Agrotain-coated with application at planting, or in splits, but less with single urea application at the 5-leaf stage.
- Split rates tended to increase yields up to 150 lbs N. Yields are likely to decline with high available N beyond plant needs especially if plants experience drought stress.

Acknowledgements

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