

Title

- Developing Sustainable Roller Crimped Cover Crop Systems for Corn and Soybeans
- Churdan, Greene County
- Two-year Project

Hypotheses

- 1) If cereal rye can develop enough biomass, then after-crimping weed pressure will be less in a no-till compared with conventional till system before soybeans.
- 2) If a bio-soil enhancer can promote increased microbial activity, then N uptake and node development will accelerate canopy formation and improve pest resistance.
- 3) If a bio-soil enhancer can improve fall hairy vetch root formation, then winter hardiness will improve, along with subsequent after-crimping spring N mobilization before corn.

Methods

- Apply cereal rye 9/15/15 into standing corn





Two days



Four days



Nine days



15 days



30 Days



38 days...right after harvest on 10/23/15



March 12, 2016 (3bu/ac)



March 12, 2016 at George's (2bu/ac)



April 20, 2016 at Billy's



April 20, 2016 at George's



5/11/16 at Billy's



5/11/16 George's



5/18/16 at Billy's (about 5' average...20% anthesis)



5/18/16 at George's (about 5' average...20% anthesis)



Drilling beans (170k/ac) and crimping rye on 5/20/16



5/22...6' tall at Billy's first pass



5/22 crimped twice at George's



5/25/16...3 days after crimping twice at Billy's



5/25/16 at George's



6/01/16 at Billy's



6/01/16 at George's



Soybean emergence 6/01/16
10 days after drilling, 67° soil temp



Soybeans 6/04 at Billy's



Soybeans 6/04 at George's



6/10/16 bio-soil enhancer application



6/11/16 at Billy's



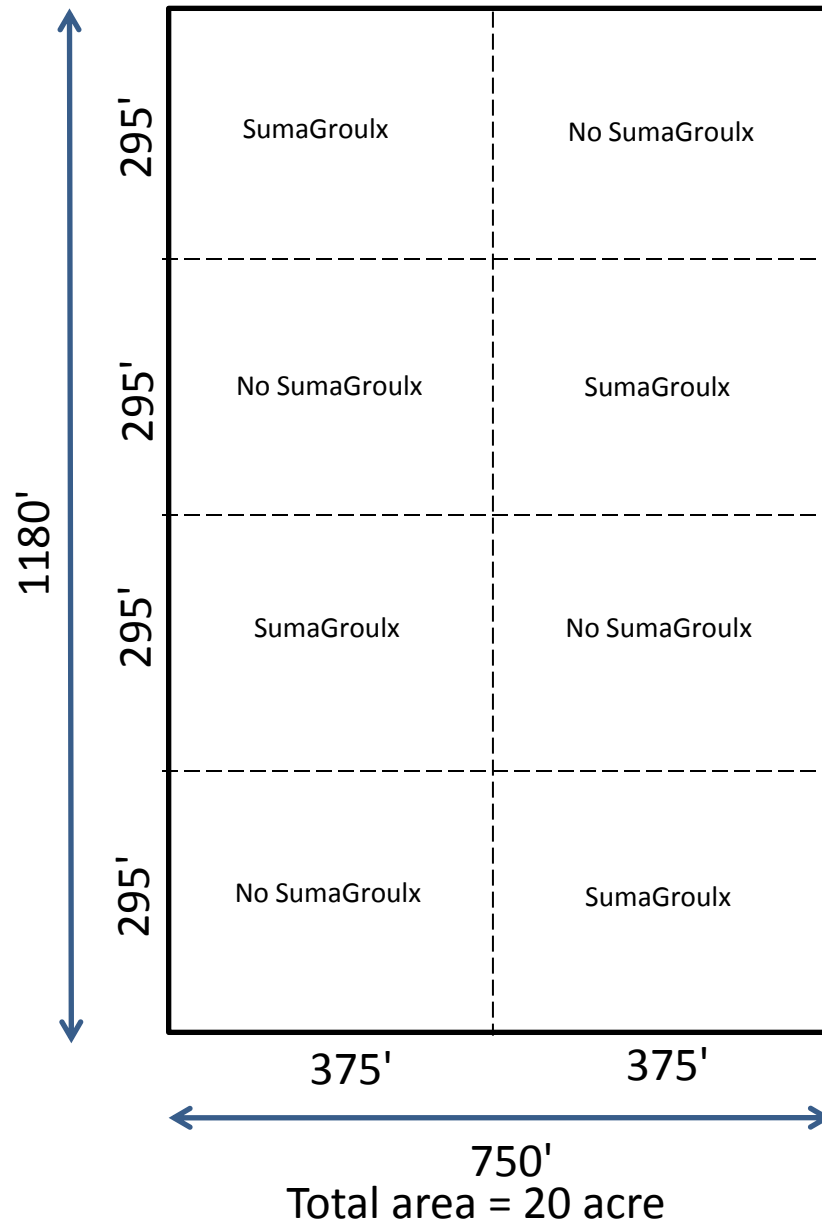
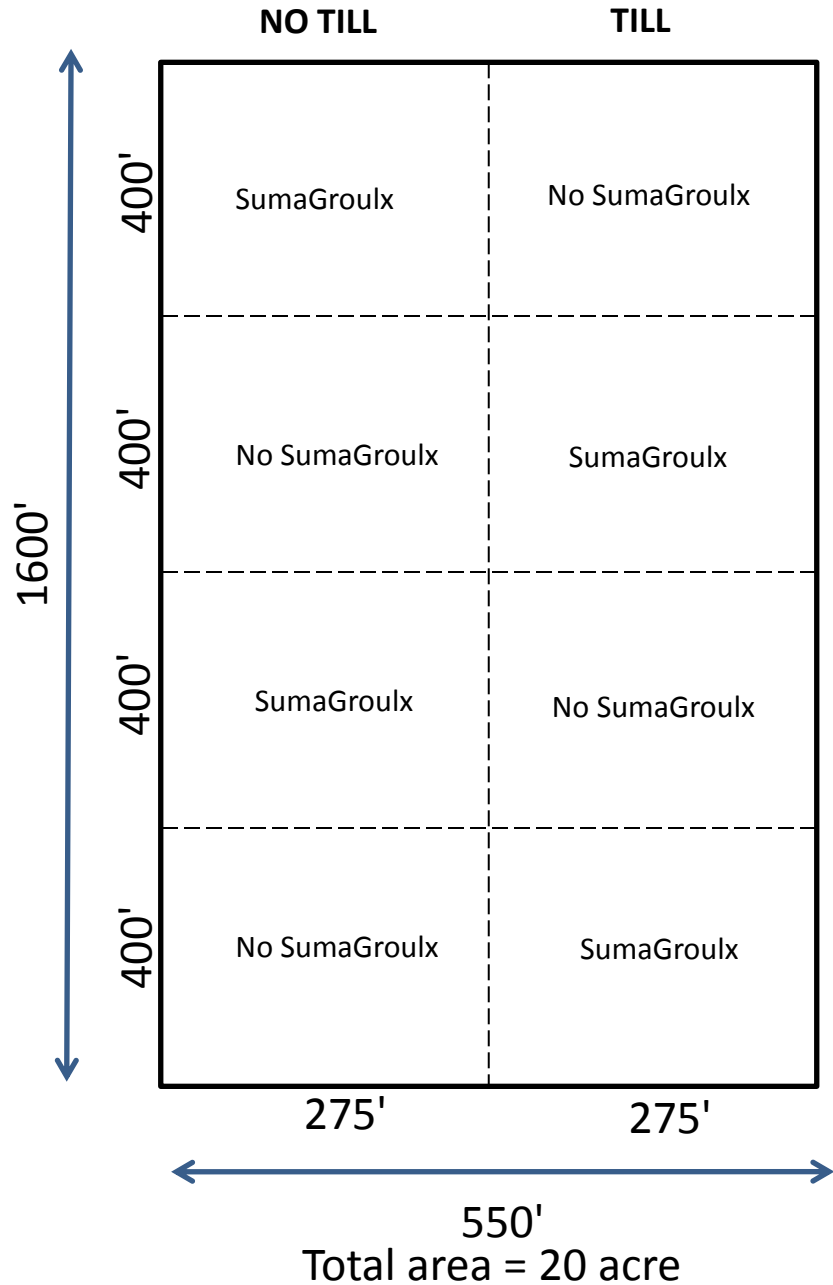
6/11/16 at George's

Trial design

GEORGE'S PLOT

Aphid and Chlorosis Resistant Seed Mix

BILLY'S PLOT: No-Till



Roller Crimper Manufacturing







Initial Biomass Results

Field	Treatment	rye biomass (kg)	in lbs
BS	Suma	3,396	7,471
BS	No suma	2,370	5,213
GN	Suma	3,463	7,618
GN	No suma	3,345	7,360

What we've learned so far

- Cultivar selection...winter hardy *AND* early maturing
- Planting...drill vs broadcast
- Biomass...retain moisture, provide adequate weed suppression and build organic matter
- Anthesis rate at crimping...the higher the level, the better initial termination

Looking ahead...second phase

- Cultivar selection...big flower vetch instead of hairy vetch since volunteer rye is likely
- Planting...big flower establishes well broadcast in no-till suboptimal conditions
- Biomass...not as high as hairy vetch, but more winter hardy
- Anthesis rate at crimping...matures up to three weeks earlier than hairy vetch

Take Away

- Roller crimping offered an alternative approach to mechanical termination of a rye cover crop
- Density of the rye stand was a primary factor
- Thinner stands were more resistant to termination at lower levels of anthesis