Educating Growers About Living Mulch Systems for Grain Crop Production

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Why?

- The unglaciated “Upper Mississippi Valley”
- Small farms; mainly dairy farms
- Intense erosion control activities during the 1930’s and 1940’s
- Typically alfalfa/corn rotation
- Clean-tilled row cropping has increased since the 1970’s
- Corn silage production has increased in the last twenty years
- No-tillage corn or soybean /living mulch system with kura clover
Overall Project Goal

• The overall project goal is to expand grower’s knowledge and awareness of alternative management system for corn and soybean that protect water quality with environmental and economic benefits
Our Goals

• Our goals are to demonstrate the effectiveness of a kura clover living mulch, compare corn and soybean yield in a kura clover living mulch compared to a traditional production system, to document reduced runoff and nitrogen availability to crops in a kura clover living mulch, and evaluate environmental and economic benefits of this alternative production system
2006 Growing Season

Soybean: Charles City, Allison, and Holland
Corn: Mason City and 2 X Plainfield
2006 Growing Season

- Mowed on May 4
- Sprayed with Glyphosate on May 16 (22 oz)
- Planted on May 26
  - Corn on May 19 and replanted on May 23
- Sprayed with Glyphosate on June 4 (40 oz)
  - Corn with Glyphosate (22 oz) + ¼ rate of Clarity
- Sprayed with Glyphosate on June 26 (22 oz)
- Harvest on October 19
Soybean Demonstration

- RCB in a split-split plot arrangement
- Main plot was with and without kura clover
- Sub-plot was 4 different plant populations (150, 200, 250, and 300K)
- Sub-sub-plot was with and without a fungicide seed treatment (Apron Maxx)
- 3 replications at each location
- Yield was collected from Charles City and Allison but not Holland
Final Plant Population

![Bar chart showing final plant population for Charles City and Allison.](chart.png)

- **Charles City**: Control (light blue) and Kura (dark blue) are compared.
  - Control has a plant population of approximately 200,000 plants/acre.
  - Kura has a plant population of approximately 150,000 plants/acre.
  - The difference is statistically significant (indicated by an asterisk).

- **Allison**: Control (light blue) and Kura (dark blue) are compared.
  - Control has a plant population of approximately 200,000 plants/acre.
  - Kura has a plant population of approximately 250,000 plants/acre.
  - The difference is not statistically significant (indicated by "NS").
Grain Yield

Control

Kura

-58%

-24%

Bu/acre

Charles City

Allison
Final Plant Height

Control
Kura

Charles City
Allison

Height (inches)
Seed Treatment and Seeding Rates

- Seed treatment did significantly improve final plant population and yield
- Result from different seeding rates was inconsistent and variable for both yield and final plant population
Other Variables

• Grain composition was influenced
  – Protein content went down in the kura clover system

• Seed size was reduced in the kura clover system

• Lodging was reduced in the kura clover system

• No interaction between seed rate or seed treatment with “kura vs no kura clover”
2007 Growing Season

• Learned a lot in 2006!
• We have to be VERY aggressive with the suppression prior to planting
• Corn and soybean has to be planted early when the ground are still “soft” so we have a chance to penetrate the rhizomes
• I bought some more iron😊
• Timing is EVERYTHING
Acknowledgement