Planting Dates for Fall Cover Crops in the Irrigated Columbia Basin.

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Dr. Bill Pan, WSU Prof Soil Sci

The intent of this note is to provide NRCS and CD field staff with planting dates for estimating biomass cover for several fall seeded cover crops.

Introduction

Fall cover cropping can greatly reduce the amount of wind erosion if the crop is seeded early enough in the fall to acquire adequate biomass to protect the soil. Planting too late in the fall should be avoided because it places a financial burden on the grower, fails to protect the soil, and lowers the acceptance of this practice.

A few considerations to consider when developing a cover crop plan: Cover crops can aggravate a ‘Green Bridge’ problem. This problem occurs when a fall planted or volunteer grain crop is not fully destroyed before seeding a spring grain crop. Root diseases develop rapidly when the ‘Green Bridge’ is not properly managed. Secondly, cover crops can also interfere with rotation requirements for some crops. Cover crops can generate a tremendous amount of biomass, and this material can make spring planting very difficult for some equipment.

Biomass mathematical models were constructed from 2 years of field data and weather records at the WSU Othello Branch Experiment Station and the Willard Lange Farm near George, Washington. Each of the plantings was made in the fall using a double disk drill into a prepared seedbed. Seeding rates were 60 lb./ac for the grains and 8 lb./ac for the mustard and rape. Historic weather records were used in association with the biomass models to create seeding dates for several cover crops.
Results

This study was designed to quantify biomass accumulation to Growing Degree-Days (GDD). Growing Degree-Days are units of temperature needed for plant growth.

- \( \text{GDD} = (\text{max daily temp} + \text{min. daily temp})/2 - \text{base temperature}. \)
- GDD cannot be less than zero.
- Wheat has a base temperature of 2.4C (36F), Rye and Triticale have a base temperature of 0C (32F), and Mustard and Rape have a base temperature of 5C (41F).

Leaf development follows a very linear relationship to Growing Degree-Days (Ball et al. 1995, Klepper et al. 1988, Sherman 1989, Stannard et al. 1998). Biomass accumulation does not follow a linear relationship because tillers account for a large percentage of the biomass. Tiller counts that we had in this experiment ranged from as low 4 tillers/plant to as high as 37 tillers/plant on a 6-leaf stage plant, oats and rye, respectively. Tillering is a product of several factors: Growing Degree-Days, Nutrients, Light, Plant Spacing, water, and crop genetics. Nutrients, light, plant spacing, and water were not limiting in this study allowing the study to focus more on the relationship of Growing Degree-Days to biomass accumulation.

Because biomass accumulation is exponential, this study clearly shows that seeding of fall cover crops should not be delayed.

How to use this Technical Note.

1. Select the table with the community with weather patterns most similar to your site.
2. Determine the amount of biomass needed going into the winter to protect the soil.
3. Look down the appropriate “Biomass Column” and determine which cover crop best meets your needs. The planting dates for each cover crop equates to the last seeding date for “X” amount of biomass.
4. Increasing the seeding rate can offset a delayed seeding date. A rule of thumb growers’ use – for every day of delay, increase the seeding rate of the small grains 1 lb./day. This rule of thumb works fairly well for 21 days. For example, if the seeding date is September 10th, the producer could wait until September 30th to seed but he would need to increase his seeding rate by 20 lb./ac.
5. Increasing the seeding rate or seeding earlier will be needed for fields that are seeded into unprepared seedbeds where depth of seed placement is not controlled.
6. A graph is provided to convert live-growing grain to equivalent small grain residue. No models have been developed to convert biomass of rape or mustard to small grain equivalent residue. However, two additional graphs are also attached and these will provide a very rough idea of how equivalent small grain residue relates to broadleaf crop biomass.
Conversion chart for growing small grain to equivalent small grain residue.
Conversion chart for growing corn, cotton, and soybean in rows perpendicular to flow to quantity of equivalent flat, small grain residue \(1\).

Conversion chart for growing corn, cotton, and soybean in rows parallel to flow to quantity of equivalent flat, small grain residue \(1\).
References


Seeding Date Tables for Several Localities in Washington.
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| **Ritzville** |         |          |          |          |           |           |           |
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| Aroostock Rye     | 26-Sep  | 21-Sep   | 17-Sep   | 12-Sep   | 10-Sep    | 8-Sep     | 7-Sep     |
| Breaker Triticale | 22-Sep  | 18-Sep   | 13-Sep   | 9-Sep    | 6-Sep     | 4-Sep     | 3-Sep     |
| Celia Triticale   | 22-Sep  | 17-Sep   | 12-Sep   | 8-Sep    | 5-Sep     | 3-Sep     | 2-Sep     |
| White Mustard     | 16-Sep  | 13-Sep   | 9-Sep    | 6-Sep    | 4-Sep     | 3-Sep     | 2-Sep     |
| Rape             | 12-Sep  | 9-Sep    | 6-Sep    | 3-Sep    | 1-Sep     | 31-Aug    | 30-Aug    |
| Moro Winter Wheat | 18-Sep  | 14-Sep   | 10-Sep   | 6-Sep    | 4-Sep     | 2-Sep     | 1-Sep     |
| Stephens Wheat    | 17-Sep  | 13-Sep   | 8-Sep    | 4-Sep    | 2-Sep     | 1-Sep     | 30-Aug    |

| **Walla Walla** |         |          |          |          |           |           |           |
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### Wilson Creek

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