



2003 Mustard Green Manure Field Day
October 23, 10 am—Noon

AGENDA

- 10:00 Sign-in, Survey, Refreshments
- 10:10 Welcome/Considerations When Using Mustard Green Manures
Andy McGuire, WSU Extension
- 10:30 Wind Erosion Control using Mustard Green Manures
Jim Dobrowolski, WSU
- 10:40 Nematode Control Potential of Mustard Green Manures
- Ekaterini Riga, WSU-Prosser
 - Russ Ingham, OSU
- 11:30 Green Manure Variety Trial Tour
- 11:50 Drawing for Mustard Seed

Thanks to the following sponsors for refreshments and other support:

- High Performance Seed, Moses Lake, WA.
- McKay Seed and , Moses Lake, WA.
- Spectrum Crop Development, Ritzville, WA.

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- The Paul Lauzier Charitable Trust
- Washington State Potato Commission
- Washington State Commission on Pesticide Registration
- USDA Sustainable Agriculture Research and Education Program (SARE)

On-farm Research Results are available at
<http://grant-adams.wsu.edu>

Considerations When Using Mustard Green Manures

1. Field Preparation and Planting method

Recommendations

After wheat: Drill it into undisturbed stubble.

Benefits of not incorporating the wheat stubble:

- reduces the amount of N needed for the mustard
- reduces the volunteer wheat pressure
- may reduce the leaching potential over the winter
- may enhance soilborne disease suppression

To facilitate this:

- cut the wheat as high above the ground as you can
- spread the chaff as evenly as you can
- get mustard seed into the soil, if only 1/8". Then keep it wet until it emerges.

Other acceptable options:

- Flying seed on before wheat harvest
- Broadcast seed after straw removal or incorporation

2. Planting Date

Your planting date may be determined by when you harvest the previous crop. If not, then consider the following:

a. Early Planting Dates (2003 trial)

White mustard emergence problems: In this year's trial, with planting dates on July 7th, 15th and 23rd, the white mustard varieties failed to emerge, probably because of high soil temperatures which caused thermodormancy (high temperature seed dormancy) or thermoinhibition (high temperature inhibition of germination) or seedling death before emergence. The seedbed for the first two plantings was dry and loose. With irrigation before the third planting, some of the white mustard emerged, but the stand did not equal that of the oriental mustard which emerged well in all three plantings. See Figure 1 on the last page.

Increased weed competition: In early plantings we observed greater weed competition from lambsquarters, pigweed, and barnyardgrass. The problem lessened with later plantings as the mustard was able to better compete with these weeds and weed growth seemed to be less vigorous.

b. Days to bloom

Mustard planted in July blooms sooner after planting than the same variety planted later in August. Mustard plants that are stressed for water or nutrients will also bloom early. With some early blooming varieties, a July planting will have to be incorporated in early September because of the risk of producing viable seed. In addition, it has been observed that biomass production in mustards correlates well with days to bloom, with higher biomass being produced from varieties that bloom later.

c. Demands for labor at time of incorporation

Harvest, fumigation and other operations can make timely chopping and incorporation of the mustard difficult. Think about the other activities you will be involved in when it comes time to incorporate the mustard and try to plan around them.

Recommendations:

Although some of the newer varieties will not bloom before the end of October if planted in mid-August, most varieties will. Therefore, for planning purposes, give yourself 60 days of growth for the mustard. Early plantings risk producing viable mustard seed and have increased weed pressure. Late plantings are limited by reduced biomass production and by the need to have irrigation water available so you can incorporate into moist soils. The table below shows acceptable planting and projected incorporation dates for an average year. Planting later blooming varieties will allow later incorporations. Because of weed pressures, July plantings are not recommended.

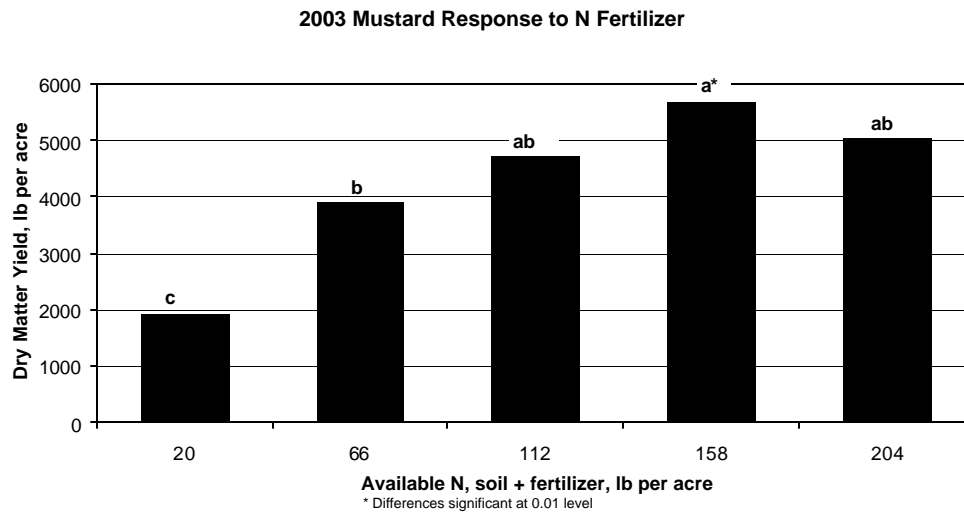
Planning Guide for Planting and Incorporation of Mustard Green Manures
Columbia Basin

Planting Date	Emergence	Flowering begins*	Planned Incorporation Date				
			1-Oct	8-Oct	15-Oct	21-Oct	29-Oct
1-Aug	5 days	Sept. 4	●	●	◻	◻	◻
8-Aug	5-6 days	Sept. 14	●	●	●	●	◻
15-Aug	5-6 days	Sept. 24	●	●	●	●	●
21-Aug	6 days	Oct. 6	◇	◇	●	●	●
27-Aug	7 days	Oct. 19	◇	◇	◇	◇	●

* For earliest flowering variety being sold in Columbia Basin

- Recommended
- ◻ Increased risk of viable seed production, plant only late blooming varieties
- ◇ Reduced biomass due to shortened growing period

3. Nitrogen requirements



4. Water requirements

Do not let soil dry out. Once the mustard canopy has closed, the moist environment at the soil surface will start to break down the wheat straw. The fungi and algae that form in these conditions can improve soil structure, which improves water infiltration (See Figures 3 and 4 on the last page)

5. Incorporation methods

See Figure 2 on last page

Incorporate the green manure as soon after chopping as possible. Make sure it goes into the soil while still green. Water is also needed for the biofumigation reaction to take place, so incorporate into a moist soil, or irrigate after incorporation.

Mustard growers have the responsibility to incorporate or otherwise kill all mustard plants in their fields, and border areas, in the fall. This will prevent overwintering of insects on these plants and will prevent problems with the existing seed industry.

6. Benefits are cumulative

See Figure 5 on last page

7. Continuing Research

- Replacement of metam sodium with mustard green manures
- Variety trials

8. New Research

- Wheat straw management effects
- Active carbon soil testing
- Using green manures to create disease suppressive soils

Figure 1



Oriental Mustard
Brassica juncea

White Mustard
Sinapis alba

Figure 2



Chopping and Disking the mustard

Figure 3



Algae and Mushrooms under mustard canopy

Figure 4



Figure 5

Cumulative Effects of Improved Soil Management

