COOPERATIVE EXTENSION
WASHINGTON STATE UNIVERSITY
GRANT AND ADAMS AREA

Mustard Green Manures
On-farm Research Results
Measurement: Planting date effects on mustard biomass

2001 Mustard Planting Date Study

Effect of planting date and growing degree days (GDD, base 40) on mustard dry matter (DM) yields (10/24/01)

Planting date	DM Yield[1]		% Yield loss[2]	GDD
	------lb/ac------			
14-Aug	4302		na[3]	
17-Aug	4758	a	0%	1433
24-Aug	3858	b	19%	1234
31-Aug	3209	c	33%	1026
7-Sep	1142	d	76%	838
14-Sep	0	e	100%	660
21-Sep	0	e	100%	468

[1] Means separation by PLSD at 0.05 level

[2] Yield loss compared to first planting date

[3] Loss due to allelopathic effects of fresh millet residue incorporated the same day as mustard planting

2002 Mustard Planting Date Study

Effect of planting date and growing degree days (GDD, base 40) on mustard dry matter (DM) yields (10/24/01)

Planting date	DM Yield[1]	% Yield loss[2]	GDD
	------lb/ac------		
13-Aug	7458	0	1428
20-Aug	5240	30%	1212
27-Aug	2760	63%	1005
3-Sep	1829	75%	783
10-Sep	negligible	100%	645
17-Sep	negligible	100%	454

[1] Means separation by PLSD at 0.05 level

[2] Yield loss compared to first planting date

COOPERATIVE EXTENSION
WASHINGTON STATE UNIVERSITY
GRANT AND ADAMS AREA

Mustard Green Manures
On-farm Research Results
Measurement: Mustard Emergence and Growth

2003 Early Planting Date Trial Results

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

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.

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.

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.

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

COOPERATIVE EXTENSION
WASHINGTON STATE UNIVERSITY
GRANT AND ADAMS AREA

Mustard Green Manures
On-farm Research Results
Measurement: Nitrogen rate effects on mustard biomass

Results:

2001 Mustard N Fertilizer Response Trial

Applied N	*S. alba* Martigena	*B. juncea* Cutlass
lb/ac	----------Ave. Dry Matter, lb/ac[1]----------	
50	3906 c	3808 c
88	4263 c	5516 bc
125	7731 ab	6013 b
163	8280 a	10479 a
200	6499 b	9911 a

[1] Yields followed by the same letter are not significantly different according to LSD (0.05)

2003 Mustard N Response Study

Caliente 119 Blend

	Dry Matter Yield[1]	
Available N, lb/ac	-------lb/ac-----	
20	1939	c
66	3925	b
112	4731	ab
158	5663	a
204	5030	ab

[1] Yields followed by the same letter are not significantly different according to LSD (0.01), Planted 8/19/03, harvested 10/17/01.