

Results:

Glucosinolate Concentrations from Greenhouse Grown Mustards

2000 - Unreplicated

Glucosinolate, Bold =ITC producing	<i>S. alba</i>					
	Roots			Shoots		
	Tilney	Ida gold	Martigena	Tilney	Ida gold	Martigena
	-----umol/g-----			-----umol/g-----		
S-2-hydroxy-3-butenyl	3.5	4.3	4.7	4.2	5.3	5.5
4-hydroxybenzyl	7.3	7.6	10.4	25.6	36.0	31.0
3-butenyl	0.0	0.0	0.0	0.1	0.5	0.5
4-hydroxy-3-indolylmethyl	0.4	0.4	0.5	0.0	0.0	0.0
4-pentenyl	0.1	0.1	0.0	0.0	0.0	0.0
benzyl	0.7	0.5	0.8	1.5	1.9	2.7
4-methylthiobutyl	3.3	3.6	5.6	0.0	0.0	0.0
3-indolylmethyl	0.3	1.4	0.6	0.1	0.2	0.3
phenylethyl	7.2	5.6	3.8	0.3	0.2	0.2
4-methoxy-3-indolylmethyl	2.7	5.3	3.2	0.0	0.1	0.1
1-methoxy-3-indolylmethyl	5.2	5.7	4.3	0.0	0.0	0.0
Total (ITC producing)	18.6	17.3	20.6	27.6	38.5	34.4

ITC = Isothiocyanate

Glucosinolate, Bold =ITC producing	<i>B. juncea</i>			
	Roots		Shoots	
	Pac. gold	Vulcan	Pac. gold	Vulcan
	-----umol/g-----		-----umol/g-----	
allyl (nat.)	7.8	5.6	50.4	46.4
4-hydroxybenzyl	0.0	0.0	0.2	0.2
3-butenyl	0.1	0.0	0.3	0.2
4-hydroxy-3-indolylmethyl	0.6	0.5	0.3	0.3
benzyl	0.0	0.0	0.1	0.1
3-indolylmethyl	0.8	0.4	0.1	0.1
phenylethyl	10.5	8.2	0.3	0.3
4-methoxy-3-indolylmethyl	4.7	2.5	0.0	0.0
1-methoxy-3-indolylmethyl	6.4	4.3	0.0	0.0
Total (ITC producing)	18.4	13.7	51.3	47.2

ITC = Isothiocyanate

Analysis by Paul Brown, Soil Biochemistry Laboratory, Soil Science Division, University of Idaho

Mustard Green Manures
On-farm Research Results
Measurement: Mustard
Glucosinolate Concentrations

Results:

Glucosinolate Concentrations of Field-Grown Mustard Shoots
 2004

<i>Brassica juncea</i>		ITC Producing Glucosinolate		<i>Sinapis alba</i>		ITC Producing Glucosinolate $\mu\text{mol/g}$	
Variety	2-propenyl			Variety	4-OH-benzyl		
ISCI 99	23.7	a		N1alba	27.8	a	
PI 458934	21.0	ab		Ida Gold	25.0	a	
Pacific Gold	18.2	bc		N3alba	24.1	a	
ISCI 20	17.4	c		N2alba	23.4	a	
ISCI 61	16.9	c		N4alba	16.7	b	
N2juncea	15.7	c		Ames 19268	16.0	b	
N1juncea	15.6	c		Martegena	15.6	b	
	3-butenyl	<i>0.05</i>			Benzyl	<i>0.05</i>	
N1juncea	4.0			N4alba	10.3		
PI 458934	2.1			Ames 19268	8.6		
ISCI 99	1.4			Martegena	8.2		
Pacific Gold	1.4			N2alba	7.5		
ISCI 20	1.0			N1alba	7.3		
ISCI 61	0.8			N3alba	6.6		
N2juncea	0.0			Ida Gold	5.6		
	Total				Total		
ISCI 99	25.2	a		N1alba	35.2	a	
PI 458934	23.1	ab		N2alba	30.9	ab	
N2juncea	19.7	bc		N3alba	30.8	ab	
Pacific Gold	19.6	bc		Ida Gold	30.6	ab	
ISCI 20	18.4	c		N4alba	27.0	b	
ISCI 61	17.7	c		Ames 19268	24.6	b	
N1juncea	15.6	c		Martegena	23.8	b	
		<i>0.05</i>				<i>0.05</i>	

¹ Varieties not connected by same letter are significantly different (levels listed below columns)

² Varieties from the USDA-ARS National Plant Germplasm System, not commercially available

Varieties planted on 8/13 at 10 lb/ac (*S. alba*) and 8 lb/ac (*B. juncea*). 150 lb N/ac applied. Three replicates harvested on 10/28. All analysis done by V. Borek and M. Morra, Soil Biochemistry Laboratory, Soil Science Division, University of Idaho.

Mustard Green Manures
On-farm Research Results
Measurement: Glucosinolate
Concentration

Results:

Glucosinolate Concentrations of Field-Grown Mustard Shoots
2003

<i>Brassica juncea</i>		ITC Producing Glucosinolate		<i>Sinapis alba</i>		ITC Producing Glucosinolate umol/g	
Variety	2-propenyl	Variety	4-OH-benzyl	Variety	Benzyl	Variety	Benzyl
PI458934 ²	24.3 a	Absolut	17.0	Absolut	7.9 abc	Absolut	24.9
ISCI 99	21.5 ab	Absolvent	23.2	Absolvent	8.7 ab	Absolvent	31.9
ISCI 61	19.3 abc	Ames 19270 ²	18.1	Ames 19270	11.4 a	Ames 19270	29.5
2003-84	17.2 bc	Cover	18.5	Cover	4.9 bc	Cover	23.3
2003-615	15.8 bc	Ida Gold	20.5	Ida Gold	4.0 c	Ida Gold	24.4
ISCI 20	14.5 c	Luna	19.0	Luna	6.9 abc	Luna	26.0
Pacific Gold	12.7 c	Martigena	26.0	Martigena	7.1 abc	Martigena	33.0
	3-butenyl 0.05						
PI458934	5.9 a						
ISCI 99	6.7 a						
ISCI 61	1.3 b						
2003-84	3.8 ab						
2003-615	0.0 b						
ISCI 20	3.4 ab						
Pacific Gold	1.1 b						
	Total 0.01						
PI458934	30.3 a						
ISCI 99	28.3 ab						
ISCI 61	20.5 abc						
2003-84	21.0 abc						
2003-615	15.8 c						
ISCI 20	17.9 bc						
Pacific Gold	13.8 c						
	0.01						

¹ Varieties not connected by same letter are significantly different (levels listed below columns)

² Varieties from the USDA-ARS National Plant Germplasm System, not commercially available
 Varieties planted on 8/19 at 12 lb/ac (*S. alba*) and 10 lb/ac (*B. juncea*). Fertilized to provide 120 lb N/ac. Three replicates harvested on 10/20. All analysis done by V. Borek and M. Morra, Soil Biochemistry Laboratory, Soil Science Division, University of Idaho.

**Mustard Green Manures
 On-farm Research Results
 Measurement: Glucosinolate
 concentrations for mustard varieties**

Glucosinolate Concentrations of Field-Grown Mustard Shoots
2002

<i>Brassica juncea</i>	IIC Producing Glucosinolate umol/g ¹
Variety	2-propenyl
PI 458934 ²	23.9 A
ISCI 20	20.5 A B
Pacific Gold	18.7 A B
ISCI 61	18.6 A B
ISCI 20, from Caliente ³	17.4 B
	3-butenyl
PI 458934 ²	3.7 A
ISCI 20	1.9 A B
ISCI 61	1.6 B
ISCI 20, from Caliente	1.4 B
Pacific Gold	1.1 B
	Total
PI 458934 ²	27.6 A
ISCI 20	22.5 A B
ISCI 61	20.2 A B
Pacific Gold	19.8 B
ISCI 20, from Caliente	18.8 B

<i>Sinapis alba</i>	IIC Producing Glucosinolate umol/g†
Variety	4-OH-benzyl
Ida Gold	21.2 A
Absolut from Caliente	18.7 A B
Ames 19270 ²	17.7 A B
Martigena	16.0 B
Absolut	15.3 B
	Benzyl
Ames 19270 ²	10.0 A
Absolut	6.1 B
Ida Gold	4.9 B
Absolut from Caliente	4.8 B
Martigena	2.6 C
	Total
Ames 19270 ²	27.8 A
Ida Gold	26.0 A B
Absolut from Caliente	23.4 A B C
Absolut	21.4 B C
Martigena	18.6 C

¹ Levels not connected by same letter are significantly different (0.05 level)

² Varieties from the USDA-ARS National Plant Germplasm System, not commercially available

³ Caliente is a commercially available blend of *S. alba* and *B. juncea* varieties

Varieties planted on 8/13 at 10 lb/ac (*S. alba*) and 8 lb/ac (*B. juncea*). Fertilized to provide 120 lb N/ac. Three replicates harvested on 10/17. All analysis done by V. Borek and M. Morra, Soil Biochemistry Laboratory, Soil Science Division, University of Idaho.

Mustard Green Manures
On-farm Research Results
Measurement: Glucosinolate
concentrations for mustard varieties

Glucosinolate Concentrations from Field- Grown Green Manure Crops							
2001 - Unreplicated							
<i>Sinapis alba</i> cultivars							
ITC Producing Glucosinolate	Martigena	Absolut	Achilles	Ida Gold	Tilney	Maxi	S. alba- Caliente
Shoots							
-----umol/g-----							
4-hydroxybenzyl	21.3	27.1	36.7	41.0	36.0	20.1	26.7
benzyl	3.2	2.9	3.2	2.5	3.2	6.0	3.8
Total (ITC producing)	24.6	30.0	39.9	43.5	39.2	26.1	30.4
Roots							
4-hydroxybenzyl	1.9	2.8	1.1	2.3	1.4	1.7	1.0
benzyl	1.4	0.9	0.2	0.5	0.5	1.0	0.3
phenylethyl	0.9	0.6	0.2	0.3	0.5	0.6	0.1
Total (ITC producing)	4.1	4.2	1.5	3.1	2.4	3.3	1.3
<i>Brassica juncea</i> cultivars							
ITC Producing Glucosinolate	Cutlass	Vulcan	Pacific Gold	ISCI20	F-E75	F-L71	B. juncea- Caliente
Shoots							
-----umol/g-----							
allyl	9.9	11.3	10.0	10.9	8.9	13.0	14.2
4-pentenyl					1.5		
phenylethyl	0.4	0.4		0.6	0.5	0.6	0.8
Total (ITC producing)	10.3	11.7	10.0	11.4	11.0	13.7	15.0
Roots							
allyl		1.2	1.4	0.6	1.7	2.1	1.9
4-pentenyl					0.4		
phenylethyl	0.5	0.8	6.0	0.8	2.7	2.1	3.6
Total (ITC producing)	0.5	2.0	7.4	1.4	4.8	4.2	5.5
ITC = Isothiocyanate							
All analysis performed on ~0.2 g subsamples with 0.2 ml internal standard, M. Morra, Soil Biochemistry Laboratory, Soil Science Division, University of Idaho							

Mustard Green Manures
On-farm Research Results
Measurement: Glucosinolate Production
by Mustard Crops

Results:

Glucosinolate (ITC producing) Production Estimates for Mustard Crops

2003			
Variety	Dry Biomass, lb/ac	Total gsl, μMol/g	GSL production, mMol/m²
S. alba			
Absolvent	6631	32	24
Ames 19270	6902	29	23
Cover	8303	23	22
Luna	7103	26	21
Ida Gold	6541	24	18
Martigena	4668	33	17
Absolut	6185	25	17
B. juncea			
ISCI 99	6570	28	21
ISCI 20	9487	18	19
PI 458934	5276	30	18
2003-84	6139	21	14
ISCI 61	5208	21	12
2003-615	6608	16	12
Pacific Gold	6781	14	10

2002			
Variety	Dry Biomass, lb/ac	Total gsl, μMol/g	GSL production, mMol/m²
S. alba			
Martigena	8535	19	18
Absolut	7484	21	18
Ida Gold	6047	26	18
B. juncea			
ISCI61	9467	20	21
ISCI20	7134	22	18
Pacific Gold	6896	20	15

**Mustard Green Manures
 On-farm Research Results
 Measurement: Glucosinolate
 Production by Mustard Varieties**

Results:

**Glucosinolate (ITC producing) Production
 Estimates for Mustard Crops**

2004

Variety	Dry Biomass, lb/ac	Total gsl, μMol/g	GSL production , mMol/m²
S. alba			
N1alba	8177	35.2	32.2
N3alba	9117	30.8	31.4
N2alba	8290	30.9	28.7
Ida Gold	7971	30.6	27.4
Martegen	8894	23.8	23.7
N4alba	6931	27.0	21.0
Ames 19268	7640	24.6	21.0
B. juncea			
ISCI 99	10489	25.2	29.6
ISCI 20	10917	18.4	22.5
Pacific Gold	7004	19.6	15.4
PI 458934	5738	23.1	14.9
ISCI 61	4686	17.7	9.3