

Cover Crops for Weed Management in Grapes.

Project Code: 06-grapecover Location: Horticulture Research Center
Investigator: Bryan Young

Investigator: Bryan Young, Associate Professor, Southern Illinois University

City State Zip Country: Carbondale IL 62901 USA
Trial Status: Final **Updated:** 8-16-06

Objective:

Determine the utility of cover crops for weed management in grapes.

Weed Code	Common Name	Scientific Name
1. LAMAM	henbit	Lamium amplexicaule L.
2. STEME	chickweed, common	Stellaria media (L.) Vill.
3. CERVU	chickweed, mouseear	Cerastium vulgatum L.
4. LAMPU	deadnettle, purple	Lamium purpureum L.
5. ERICA	horseweed	Conyza canadensis (L.) Crong.
6. TRFRE	clover, white	Trifolium repens L.
7. CAPBP	shepherdspurse	Capsella bursa-pastoris (L.) Medicus
8. PHTAM	pokeweed, common	Phytolacca americana L.
9. GERCA	geranium, Carolina	Geranium carolinianum L.
10. VICVI	vetch, hairy	Vicia villosa roth ssp.villosa
11. SETFA	foxtail, giant	Setaria faberi Herrm.
12. DIGSA	crabgrass, large	Digitaria sanguinalis (L.) Scop.
13. ECHCG	barnyardgrass	Echinochloa crus-galli (L.) Beauv.
14. DIGIS	crabgrass, smooth	Digitaria ischaemum (Schreb. ex Schweig)
15. AMPAL	milkweed, honeyvine	Ampelamus albidus (Nutt.) Britt.
16. SONAR	sowthistle, perennial	Sonchus arvensis L.
17. PASDI	dallisgrass	Paspalum dilatatum poir.

Crop 1: VITVI grape
Planting Method: Established

Plot Width, Unit: 3 FT **Plot Length, Unit:** 24 FT **Reps:** 3
Tillage Type: No-Till **Study Design:** Randomized complete block

APPLICATION DESCRIPTION		A	B	C	D	E	F	G	H
Application Date:	3-31-05	4-27-05	5-31-05	7-7-05	10-5-05	9-6-05	6-13-06	6-13-06	
Time of Day:	8:30		16:00	10:30		15:00	15:00	15:00	
Application Method:	Spray	Plant	Spray	Spray	Plant	Spray	Spray	Spray	
Application Timing:	PREBUD	1WA-A	6"COVER	6"WEEDS	AUGUST	AUG-IN	6" COVER	6" WEEDS	
Applic. Placement:	BROFOL		BROFOL	BROFOL		See comment	BROFOL		
Air Temp., Unit:	60 F		81 F	87 F					
% Relative Humidity:	38		38	51			35		
Wind Velocity, Unit:	4-5 MPH		2-3 MPH	2-3 MPH			4.5 MPH	4.5 MPH	
Dew Presence (Y/N):	N		N	N			N		
Soil Temp., Unit:	54 F		88 F	82 F			83 F	83 F	
Soil Moisture:	NORMAL		BELNOR	NORMAL			NORMAL	NORMAL	
% Cloud Cover:	0		5	0			0	0	

CROP STAGE AT EACH APPLICATION		A	B	C	D	E	F	G	H
Crop 1 Code, Stage:	VITVI NA	VITVI NA	VITVI NA	VITVI NA	VITVI NA	VITVI NA	VITVI NA	VITVI NA	VITVI NA
Height, Unit:	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA

WEED STAGE AT EACH APPLICATION		A	B	C	D	E	F	G	H
Weed 1 Code:	LAMAM								
Stage(leaves):	8-10								
Height(inches):	2-3								
Density:	Low								
Weed 2 Code:	STEME								
Stage(leaves):	10+								
Height(inches):	1-2								
Density:	High								
Weed 3 Code:	CERVU								
Stage(leaves):	10+								
Height(inches):	0-1								
Density:	Medium								
Weed 4 Code:	LAMPU								
Stage(leaves):	10+								
Height(inches):	2-3								
Density:	Medium								
Weed 5 Code:								ERICA	ERICA
Stage(leaves):								10+	10+
Height(inches):								8-30	8-30
Density:								Medium	Medium
Weed 6 Code:								TRFRE	TRFRE
Stage(leaves):								10+	10+
Height(inches):								5-7	5-7
Density:								Medium	Medium

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Weed14 Code:	DIGIS	DIGIS
Stage (leaves) :	3-6	3-6
Height (inches) :	6-15	6-15
Density:	High	High
Weed15 Code:	AMPAL	AMPAL
Stage (leaves) :	10+	10+
Height (inches) :	18-30	18-30
Density:	Medium	Medium
Weed16 Code:	SONAR	SONAR
Stage (leaves) :	10+	10+
Height (inches) :	24-36	24-36
Density:	Medium	Medium

APPLICATION EQUIPMENT

	A	B	C	D	E	F	G	H
Appl. Equipment:	CO2 sprayer	Power-rake	CO2 sprayer	CO2 sprayer	Tiller+Rake	CO2 sprayer	CO2 sprayer	CO2 sprayer
Operating Pressure:	40 PSI		40 PSI	40 PSI		40 PSI	40 PSI	40 PSI
Nozzle Type:	Flat fan		Flat fan	Flat fan		Flat fan	Flat fan	Flat fan
Nozzle Size:	8002E		8002E	8002E		8002E	8002E	8002E
Boom Length, Unit:	3 FT		3 FT	3 FT		3 FT	3 FT	3 FT
Spray Volume, Unit:	20 GPA		20 GPA	20 GPA		20 GPA	20 GPA	20 GPA

NOTES:

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Weed Code
Crop Code
Rating Data Type
Rating Unit
Rating Date
Trt-Eval Interval

LAMAM LAMAM STEME STEME CERVU CERVU
VITVI VITVI
Injury Injury
Percent Percent
5-31-05 7-7-05 Control Control Control Control Control Control
0 DA-C 0 DA-D 14 DA-A 0 DA-C 14 DA-A 0 DA-C 14 DA-A 0 DA-C

Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Prod Rate	Prod Unit	Grow Stg	Appl Code								
1	NONTREATED									0	0	0	0	0	0	0
2	ROUNDUP W-MAX	4.5	SL	0.77 lb ae/a	22	fl oz/a	PREBUD	A		0	0	99	98	99	99	99
2	CHATEAU	51	WG	0.191 lb ai/a	6.0	oz/a	PREBUD	A								
2	GRAMOXONE MAX	3	SL	0.75 lb ai/a	2.0	pt/a	6"WEEDS	D								
2	ACTIVATOR 90	100	LIQ	0.25 % v/v	0.25	% v/v	6"WEEDS	D								
3	ROUNDUP W-MAX	4.5	SL	0.77 lb ae/a	22	fl oz/a	PREBUD	A		0	0	99	78	99	99	99
3	PLANT OATS						1WA-A	B								
3	GRAMOXONE MAX	3	SL	0.094 lb ai/a	4.0	fl oz/a	6"COVER	C								
3	ACTIVATOR 90	100	LIQ	0.25 % v/v	0.25	% v/v	6"COVER	C								
4	ROUNDUP W-MAX	4.5	SL	0.77 lb ae/a	22	fl oz/a	PREBUD	A		0	0	99	99	99	99	99
4	PLANT MUSTARD						1WA-A	B								
4	GRAMOXONE MAX	3	SL	0.094 lb ai/a	4.0	fl oz/a	6"COVER	C								
4	ACTIVATOR 90	100	LIQ	0.25 % v/v	0.25	% v/v	6"COVER	C								
5	ROUNDUP W-MAX	4.5	SL	0.77 lb ae/a	22	fl oz/a	PREBUD	A		0	0	99	94	99	99	99
5	CHATEAU	51	WG	0.191 lb ai/a	6.0	oz/a	PREBUD	A								
5	GRAMOXONE MAX	3	SL	0.75 lb ai/a	2.0	pt/a	6"WEEDS	D								
5	ACTIVATOR 90	100	LIQ	0.25 % v/v	0.25	% v/v	6"WEEDS	D								
5	PLANT LITTLE BARLEY						AUGUST	E								
5	GRAMOXONE MAX	3	SL	0.75 lb ai/a	2.0	pt/a	AUG-IN	F								
5	ACTIVATOR 90	100	LIQ	0.25 % v/v	0.25	% v/v	AUG-IN	F								
LSD (P=.05)										0.0	0.0	0.0	16.0	0.0	0.0	0.0
Replicate F										0.000	0.000	0.000	1.626	0.000	0.000	0.000
Replicate Prob(F)										1.0000	1.0000	1.0000	0.2556	1.0000	1.0000	1.0000
Treatment F										0.000	0.000	0.000	73.382	0.000	0.000	0.000
Treatment Prob(F)										1.0000	1.0000	1.0000	0.0001	1.0000	1.0000	1.0000

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Weed Code
Crop Code
Rating Data Type
Rating Unit
Rating Date
Trt-Eval Interval

LAMPU LAMPU ERICA ERICA ERICA TRFRE TRFRE CAPBP
Control Control Control Control Control Control Control Control
Percent Percent Percent Percent Percent Percent Percent Percent
4-14-05 5-31-05 5-31-05 5-31-05 7-7-05 5-31-05 7-7-05 5-31-05
14 DA-A 0 DA-C 0 DA-C 0 DA-C 0 DA-D 0 DA-C 0 DA-D 0 DA-C

Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Prod Rate	Prod Unit	Grow Stg	Appl Code								
1	NONTREATED									0	0	0	0	0	0	0
2	ROUNDUP W-MAX	4.5	SL	0.77 lb ae/a	22	fl oz/a	PREBUD	A		99	99	91	69	69	93	98
2	CHATEAU	51	WG	0.191 lb ai/a	6.0	oz/a	PREBUD	A								
2	GRAMOXONE MAX	3	SL	0.75 lb ai/a	2.0	pt/a	6"WEEDS	D								
2	ACTIVATOR 90	100	LIQ	0.25 % v/v	0.25	% v/v	6"WEEDS	D								
3	ROUNDUP W-MAX	4.5	SL	0.77 lb ae/a	22	fl oz/a	PREBUD	A		99	99	99	99	99	52	97
3	PLANT OATS						1WA-A	B								
3	GRAMOXONE MAX	3	SL	0.094 lb ai/a	4.0	fl oz/a	6"COVER	C								
3	ACTIVATOR 90	100	LIQ	0.25 % v/v	0.25	% v/v	6"COVER	C								
4	ROUNDUP W-MAX	4.5	SL	0.77 lb ae/a	22	fl oz/a	PREBUD	A		99	99	99	99	99	80	98
4	PLANT MUSTARD						1WA-A	B								
4	GRAMOXONE MAX	3	SL	0.094 lb ai/a	4.0	fl oz/a	6"COVER	C								
4	ACTIVATOR 90	100	LIQ	0.25 % v/v	0.25	% v/v	6"COVER	C								
5	ROUNDUP W-MAX	4.5	SL	0.77 lb ae/a	22	fl oz/a	PREBUD	A		99	98	99	99	99	92	98
5	CHATEAU	51	WG	0.191 lb ai/a	6.0	oz/a	PREBUD	A								
5	GRAMOXONE MAX	3	SL	0.75 lb ai/a	2.0	pt/a	6"WEEDS	D								
5	ACTIVATOR 90	100	LIQ	0.25 % v/v	0.25	% v/v	6"WEEDS	D								
5	PLANT LITTLE BARLEY						AUGUST	E								
5	GRAMOXONE MAX	3	SL	0.75 lb ai/a	2.0	pt/a	AUG-IN	F								
5	ACTIVATOR 90	100	LIQ	0.25 % v/v	0.25	% v/v	AUG-IN	F								
LSD (P=.05)										0.0	1.9	6.0	43.3	43.3	26.4	1.5
Replicate F										0.000	1.000	1.000	1.000	1.000	2.289	1.000
Replicate Prob(F)										1.0000	0.4096	0.4096	0.4096	0.4096	0.1636	0.4096
Treatment F										0.000	5476.938	565.050	10.468	10.468	23.196	9556.001
Treatment Prob(F)										1.0000	0.0001	0.0001	0.0029	0.0029	0.0002	0.0001

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Weed Code	PHTAM	PHTAM	GERCA	VICVI	SETFA	DIGSA	DIGSA	ECHCG
Crop Code								
Rating Data Type	Control	Control	Control	Control	Control	Control	Control	Control
Rating Unit	Percent	Percent	Percent	Percent	Percent	Percent	Percent	Percent
Rating Date	5-31-05	5-31-05	5-31-05	5-31-05	5-31-05	5-31-05	7-7-05	7-7-05
Trt-Eval Interval	0 DA-C	0 DA-C	0 DA-C	0 DA-C	0 DA-C	0 DA-C	0 DA-D	0 DA-D

Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Prod Rate	Prod Unit	Grow Stg	Appl Code								
1	NONTREATED									0	0	0	0	0	0	0	0
2	ROUNDUP W-MAX	4.5	SL	0.77	lb ae/a	22	fl oz/a	PREBUD	A	61	60	99	99	78	57	8	0
2	CHATEAU	51	WG	0.191	lb ai/a	6.0	oz/a	PREBUD	A								
2	GRAMOXONE MAX	3	SL	0.75	lb ai/a	2.0	pt/a	6"WEEDS	D								
2	ACTIVATOR 90	100	LIQ	0.25	% v/v	0.25	% v/v	6"WEEDS	D								
3	ROUNDUP W-MAX	4.5	SL	0.77	lb ae/a	22	fl oz/a	PREBUD	A	0	33	76	99	75	60	10	0
3	PLANT OATS							1WA-A	B								
3	GRAMOXONE MAX	3	SL	0.094	lb ai/a	4.0	fl oz/a	6"COVER	C								
3	ACTIVATOR 90	100	LIQ	0.25	% v/v	0.25	% v/v	6"COVER	C								
4	ROUNDUP W-MAX	4.5	SL	0.77	lb ae/a	22	fl oz/a	PREBUD	A	99	99	69	99	62	63	45	0
4	PLANT MUSTARD							1WA-A	B								
4	GRAMOXONE MAX	3	SL	0.094	lb ai/a	4.0	fl oz/a	6"COVER	C								
4	ACTIVATOR 90	100	LIQ	0.25	% v/v	0.25	% v/v	6"COVER	C								
5	ROUNDUP W-MAX	4.5	SL	0.77	lb ae/a	22	fl oz/a	PREBUD	A	66	99	99	73	96	60	0	0
5	CHATEAU	51	WG	0.191	lb ai/a	6.0	oz/a	PREBUD	A								
5	GRAMOXONE MAX	3	SL	0.75	lb ai/a	2.0	pt/a	6"WEEDS	D								
5	ACTIVATOR 90	100	LIQ	0.25	% v/v	0.25	% v/v	6"WEEDS	D								
5	PLANT LITTLE BARLEY							AUGUST	E								
5	GRAMOXONE MAX	3	SL	0.75	lb ai/a	2.0	pt/a	AUG-IN	F								
5	ACTIVATOR 90	100	LIQ	0.25	% v/v	0.25	% v/v	AUG-IN	F								
LSD (P=.05)										70.8	59.9	47.7	38.4	31.3	26.7	17.0	0.0
Replicate F										0.341	1.963	2.597	1.000	5.020	8.107	4.061	0.000
Replicate Prob(F)										0.7211	0.2025	0.1351	0.4096	0.0387	0.0119	0.0606	1.0000
Treatment F										4.070	5.457	7.736	13.254	14.696	10.793	12.786	0.000
Treatment Prob(F)										0.0434	0.0203	0.0074	0.0013	0.0009	0.0026	0.0015	1.0000

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Weed Code	TTTTT	ERICA	DIGIS	AMPAL	TRFRE	SONAR
Crop Code						
Rating Data Type	Control	Control	Control	Control	Control	Control
Rating Unit	Percent	Percent	Percent	Percent	Percent	Percent
Rating Date	6-9-06	6-9-06	6-9-06	6-9-06	6-9-06	6-9-06
Trt-Eval Interval	-4 DA-G	-4 DA-G	-4 DA-G	-4 DA-G	-4 DA-G	-4 DA-G

Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Prod Rate	Prod Unit	Grow Stg	Appl Code								
1	NONTREATED									0	0	0	0	0	0		
2	ROUNDUP W-MAX	4.5	SL	0.77	lb ae/a	22	fl oz/a	PREBUD	A	86	63	77	88	93	96		
2	CHATEAU	51	WG	0.191	lb ai/a	6.0	oz/a	PREBUD	A								
2	GRAMOXONE MAX	3	SL	0.75	lb ai/a	2.0	pt/a	6"WEEDS	D								
2	ACTIVATOR 90	100	LIQ	0.25	% v/v	0.25	% v/v	6"WEEDS	D								
3	ROUNDUP W-MAX	4.5	SL	0.77	lb ae/a	22	fl oz/a	PREBUD	A	73	98	32	76	82	98		
3	PLANT OATS							1WA-A	B								
3	GRAMOXONE MAX	3	SL	0.094	lb ai/a	4.0	fl oz/a	6"COVER	C								
3	ACTIVATOR 90	100	LIQ	0.25	% v/v	0.25	% v/v	6"COVER	C								
4	ROUNDUP W-MAX	4.5	SL	0.77	lb ae/a	22	fl oz/a	PREBUD	A	94	98	88	65	94	99		
4	PLANT MUSTARD							1WA-A	B								
4	GRAMOXONE MAX	3	SL	0.094	lb ai/a	4.0	fl oz/a	6"COVER	C								
4	ACTIVATOR 90	100	LIQ	0.25	% v/v	0.25	% v/v	6"COVER	C								
5	ROUNDUP W-MAX	4.5	SL	0.77	lb ae/a	22	fl oz/a	PREBUD	A	63	32	72	83	60	33		
5	CHATEAU	51	WG	0.191	lb ai/a	6.0	oz/a	PREBUD	A								
5	GRAMOXONE MAX	3	SL	0.75	lb ai/a	2.0	pt/a	6"WEEDS	D								
5	ACTIVATOR 90	100	LIQ	0.25	% v/v	0.25	% v/v	6"WEEDS	D								
5	PLANT LITTLE BARLEY							AUGUST	E								
5	GRAMOXONE MAX	3	SL	0.75	lb ai/a	2.0	pt/a	AUG-IN	F								
5	ACTIVATOR 90	100	LIQ	0.25	% v/v	0.25	% v/v	AUG-IN	F								
LSD (P=.05)										14.8	37.6	35.6	27.9	16.7	42.5		
Replicate F										0.574	0.250	1.762	1.686	1.540	0.799		
Replicate Prob(F)										0.5849	0.7849	0.2322	0.2449	0.2719	0.4826		
Treatment F										67.540	13.674	11.317	17.617	58.818	12.405		
Treatment Prob(F)										0.0001	0.0012	0.0022	0.0005	0.0001	0.0017		

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Weed Code
Crop Code
Rating Data Type
Rating Unit
Rating Date
Trt-Eval Interval

TTTTT ERICA DIGSA PASDI
Control Control Control Control VITVI VITVI
Percent Percent Percent Percent Leafarea Dry wt
8-5-06 8-5-06 8-5-06 8-5-06 sqcm/LF g/Leaf
53 DAT 53 DAT 53 DAT 53 DAT

Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Prod Rate	Prod Unit	Grow Stg	Appl Code						
1	NONTREATED									0	0	0	0	120	0.81
2	ROUNDUP W-MAX	4.5	SL	0.77	lb ae/a	22	fl oz/a	PREBUD	A	63	99	62	91	128	0.84
2	CHATEAU	51	WG	0.191	lb ai/a	6.0	oz/a	PREBUD	A						
2	GRAMOXONE MAX	3	SL	0.75	lb ai/a	2.0	pt/a	6"WEEDS	D						
2	ACTIVATOR 90	100	LIQ	0.25	% v/v	0.25	% v/v	6"WEEDS	D						
3	ROUNDUP W-MAX	4.5	SL	0.77	lb ae/a	22	fl oz/a	PREBUD	A	10	93	0	99	122	0.79
3	PLANT OATS							1WA-A	B						
3	GRAMOXONE MAX	3	SL	0.094	lb ai/a	4.0	fl oz/a	6"COVER	C						
3	ACTIVATOR 90	100	LIQ	0.25	% v/v	0.25	% v/v	6"COVER	C						
4	ROUNDUP W-MAX	4.5	SL	0.77	lb ae/a	22	fl oz/a	PREBUD	A	10	99	0	99	131	0.85
4	PLANT MUSTARD							1WA-A	B						
4	GRAMOXONE MAX	3	SL	0.094	lb ai/a	4.0	fl oz/a	6"COVER	C						
4	ACTIVATOR 90	100	LIQ	0.25	% v/v	0.25	% v/v	6"COVER	C						
5	ROUNDUP W-MAX	4.5	SL	0.77	lb ae/a	22	fl oz/a	PREBUD	A	70	99	80	70	116	0.76
5	CHATEAU	51	WG	0.191	lb ai/a	6.0	oz/a	PREBUD	A						
5	GRAMOXONE MAX	3	SL	0.75	lb ai/a	2.0	pt/a	6"WEEDS	D						
5	ACTIVATOR 90	100	LIQ	0.25	% v/v	0.25	% v/v	6"WEEDS	D						
5	PLANT LITTLE BARLEY							AUGUST	E						
5	GRAMOXONE MAX	3	SL	0.75	lb ai/a	2.0	pt/a	AUG-IN	F						
5	ACTIVATOR 90	100	LIQ	0.25	% v/v	0.25	% v/v	AUG-IN	F						
LSD (P=.05)										15.4	9.2	20.2	26.6	24.7	0.134
Replicate F										2.500	1.000	1.921	0.850	0.480	0.104
Replicate Prob(F)										0.1434	0.4096	0.2083	0.4628	0.6354	0.9028
Treatment F										49.600	237.530	40.217	26.355	0.663	0.900
Treatment Prob(F)										0.0001	0.0001	0.0001	0.0001	0.6351	0.5071

Trial Comments

1. Protocol: SIU-BGY.
2. Ratings: CI/WC 2 weeks after application A and prior to applications C, D and F.
3. Blanket application of Gramoxone Max at 2.0 pt/A applied to all plots on 9-6-05.
4. DA-A, DA-C, and DA-D are days after applications A, C, and D, respectively.
Ratings at 0 days after application are prior to application.
Dry wt = Oven dry weight. sqcm/LF = Square centimeter per leaf. g/LEAF = Grams per leaf.
5. Ratings at -4 DA-G are prior to the "C" and "D" applications in 2006.
6. Ratings on 8-5-06 at 53 DAT are 53 days after the "C" and "D" applications in 2006 and prior to the August blanket application of Gramoxone.
7. A blanket application of Gramoxone Max (2.0 pt/A) plus Activator 90 (0.25%) was applied to all plots except the nontreated on August 10, 2006.
8. Only the little barley successfully re-seeded itself the following fall and provided nearly 100% cover with very few weeds emerging through the covercrop as of December 2006.