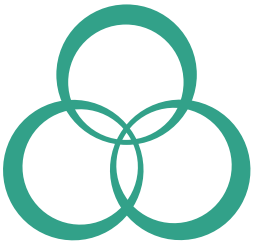
Field Trial Report

Surround: Evaluation of the Effects of Surround WP on Apple

Ron Britt, Yakima, WA



NovaSource Advisory Council

2008

Study Description:	**Evaluation of the Effects of Surround WP on Apple**
Reference Number:	
Researcher:	Ron Britt & Associates, Inc.; 7200 West Nob Hill Blvd., Suite 18; P.O. Box 8336; Yakima, WA 98908
Location:	Zillah, WA
Year:	2008
Trial Quality (Excellent, Good, Fair, Poor):	Excellent

Product(s):	Surround WP, Eclipse, Raynox
Rate(s):	Surround 50 lb/A followed by 25 lb/A; 5 applications Raynox 2.5 gpa; 5 applications Eclipse 3 gpa; 5 applications
Adjuvant(s):	NA
Rate(s):	

Crop(s):	Apple
Variety:	Granny Smith
Pest(s):	
Quality:	Sunburn
Summary:	The results for the sunburn evaluation indicated that all treatments performed better than the untreated control. Treatment 4, Eclipse, had the most sunburn damage of all the treated plots. Treatment 3, Raynox, had the second highest damage from sunburn in the treated plots, which was statistically equal to the results in the Eclipse plot. Treatment 2, Surround WP, had statistically less sunburn damage than the other treatments. Only 13.5% of the fruit treated with Surround WP was damaged from sunburn compared to Eclipse with 27.7% and Raynox with 23.5% sunburn. The untreated check plot had three times the sunburn damage as the Surround WP treatment. Conclusion: Surround WP was superior to the other sunburn control materials when applied multiple times throughout the summer to harvest. More applications on a shortening lapse time between applications may have reduced sunburn even more with the Surround WP treatment.

Evaluation of the Effect of Surround WP on Apples

Study Director: Kurt Volker, NovaSource
Principal Investigator: Ron Britt, Ron Britt & Associates

Trial Location
City: Granger
State/Prov.: Washington
Postal Code: 98932
Country: USA

Crop Description
Crop 1: MABSD Malus domestica Apple
BBCH Scale: BPOM
Row Spacing, Unit: 11.5 ft Spacing Within Row, Unit: 6 ft

Site and Design
Plot Width, Unit: 115 ft
Plot Length, Unit: 186 ft
Replications: 4 Study Design: Randomized Complete Block

Table 1: Application description

	A	B	C	D	E
Application Date:	27/Jun/2008	8/Jul/2008	10/Aug/2008	28/Aug/2008	12/Sep/2008
Time of Day:	5:00 PM	9:00 AM	4:00 PM	6:00 PM	5:00 PM
Application Method:	Sprayer	Sprayer	Sprayer	Sprayer	Sprayer
Application Placement:	Foliar	Foliar	Foliar	Foliar	Foliar
Applied By:	RB	RB	RB	RB	RB
Air Temperature, Unit:	80°F	78°F	77°F	77°F	73°F
% Relative Humidity:	34	34	34	47	29
Wind Velocity, Unit:	0 MPH	1 MPH	0 MPH	1 MPH	0 MPH
Dew Presence (Y/N):	N	N	N	N	N
Soil Temperature, Unit:	64°F	80°F	83°F	80°F	79°F
Soil Moisture:	Adequate	Adequate	Adequate	Adequate	Adequate
% Cloud Cover:	0	0	0	0	15

Table 2: Crop stage at each application

	A	B	C	D	E
Crop 1 Code, BBCH Scale:	MABSD BPOM	MABSD BPOM	MABSD BPOM	MABSD BPOM	MABSD BPOM
Stage Scale Used:	BBCH	BBCH	BBCH	BBCH	BBCH

Table 3: Application equipment

	A	B	C	D	E
Application Equipment:	MiniBlast	MiniBlast	MiniBlast	MiniBlast	MiniBlast
Operating Pressure, Unit:	115 PSI	115 PSI	115 PSI	115 PSI	120 PSI
Nozzle Type:	TeeJet	TeeJet	TeeJet	TeeJet	TeeJet
Nozzle Size:	4444	4444	4444	4444	6655
Nozzles/Row:	4	4	4	4	4
Ground Speed, Unit:	1.5 MPH	1.5 MPH	1.5 MPH	1.5 MPH	1.5 MPH
Carrier:	Water	Water	Water	Water	Water
Spray Volume, Unit:	100 Gal/A	100 Gal/A	100 Gal/A	100 Gal/A	100 Gal/A
Mix Size, Unit:	100 Gal	100 Gal	100 Gal	100 Gal	100 Gal
Spray pH:	7.0	7.0	7.0	7.0	7.0

Table 4: Sunburn reduction using Surround WP

Trt. No.	Type	Treatment Name	Form Conc	Form Unit	Form Type	Rate	Rate Unit	Other Rate	Other Rate Unit	Growth Stage	Appl Code
1	check										
2	product	Surround			WP			50	lb/a		A
	product	Surround			WP			25	lb/a		ABCDE
3	product	Raynox									ABCDE
4	product	Eclipse									ABCDE

Replications: 4, Design: Randomized Complete Block, Treatment units: US standard, Treated plot size Width: 115 feet, Treated plot size Length: 186 feet, Application volume: 100 gal/ac, Mix size: 100 gallons, Mix overage: 5%, Format definitions: G-All7. DEF, G-All7.FRM

Trial Comments

Methods and Materials

The purpose of this trial was to evaluate the efficacy of Surround WP, Raynox and Eclipse on apples for sunburn reduction and quality enhancement. The site selected was a 6-year-old Granny Smith apple orchard located in the lower Yakima Valley near Granger, WA. The trees were planted on M9 rootstock and irrigated with a drip irrigation system. The orchard floor has a permanent grass cover crop. The trees were trained on a trellis system and were approximately 8 feet in height and planted on an 11.5 foot row spacing with 6 feet between the trees. There were approximately 631 trees per acre. Normal cultural practices were followed to ensure the health of the orchard and the integrity of the trial.

Four subsamples were taken from each large plot. At harvest professional apple pickers harvested entire trees for each sample randomly through the plot. The large sample was divided into four subsamples of 400 apples each. The samples were processed through a commercial Greffa sorting machine with electronic cameras that separate the sunburned fruit out of each sample. The sunburned fruit was counted and the percent sunburn was calculated.

Applications

The applications were made with a commercial Rears airblast sprayer calibrated to deliver 100 gallons per acre. The sprayer was calibrated to deliver 200 gallons per acre only on the first application of Surround WP as per protocol. The tractor's speed was maintained at 1.5 miles per hour and the pump pressure operated at 115 pounds per square inch. The first application of Surround WP was applied at 200 gallons per acre. The Raynox and Eclipse treatments were applied at 100 gallons per acre. All subsequent applications were applied at 100 gallons per acre for all treatments.

The treatments were as follows:

Treatment 1 – Untreated Check

Treatment 2 – Surround WP at 50 pounds per acre applied at 200 gallons per acre first application date

Treatment 2 – Surround WP at 25 pounds per acre applied at 100 gallons per acre for the last 4 applications

Treatment 3 – Raynox at 2.5 gallons per acre at 100 gallons per acre for all 5 applications

Treatment 4 – Eclipse at 3 gallons per acre at 100 gallons per acre for all 5 applications

A total of five applications were applied throughout the season. The treatments began on 27 June 2008 followed by applications on 8 July 2008, 10 August 2008, 28 August 2008 and 12 September 2008.

Evaluation

The apples were sampled on 30 September 2008 at regular harvest time. Professional apple pickers harvested one bin, approximately twenty two, forty pound boxes of Granny Smith apples per plot. The pickers harvested all of the fruit from each of the randomly selected trees from the middle of each plot. It took approximately 10 trees to fill each bin with apples. The fruit was transported immediately to cold storage.

On 30 October 2008, one month after harvest, the sampled fruit was taken out of cold storage and processed over a Greffa electronic sorting line. The electronic cameras separated the sunburned fruit from each sample. The sunburned fruit for each sample was counted and the percent of sunburn damage was calculated.

Results

The results for the sunburn evaluation indicated that all treatments performed better than the untreated control. Treatment 4, Eclipse, had the most sunburn damage of all the treated plots. Treatment 3, Raynox, had the second highest damage from sunburn in the treated plots, which was statistically equal to the results in the Eclipse plot. Treatment 2, Surround WP, had statistically less sunburn damage than the other treatments.Only 13.5 percent of the fruit treated with Surround WP was damaged from sunburn compared to Eclipse which had twice as much damage with 27.7 percent sunburn. The untreated check plot had three times the sunburn damage as the Surround WP treatment.

Conclusion

Surround WP was superior to the other sunburn control materials when applied multiple times throughout the summer to harvest. More applications on a shortening lapse time between applications may have reduced sunburn even more with the Surround WP treatment.

Table 5: Sunburn reduction using Surround WP

Pest Code:					Sunburn	
Pest Name:					Sunburn	
Crop Code:					MABSD	
BBCH Scale:					BPOM	
Crop Name:					Apple	
Description:					# Fruit w/sunburn	
Part Rated:					Fruit C	
Rating Date:					9/30/2008	
Rating Date Type:					Sunburn	
Sample Size:					400	
Sample Size Unit:					Fruit	
Days After First/Last Application:					95 18	
Trt. No.	Treatment Name	Product Rate	Product Rate Unit	Plot	1	2
1	Untreated			101	136.00	34.00
				204	164.00	41.00
				303	164.00	41.00
				401	187.00	47.00
			Mean:		162.75	40.75
2	Surround			102	52.00	13.00
	Surround			203	62.00	16.00
				304	40.00	10.00
				402	58.00	15.00
			Mean:		53.00	13.50
3	Raynox			103	121.00	30.00
				201	74.00	19.00
				302	106.00	27.00
				403	70.00	18.00
			Mean:		92.75	23.50
4	Eclipse			104	125.00	31.00
				202	126.00	32.00
				301	99.00	25.00
				404	93.00	23.00
			Mean:		110.75	27.75

Table 6: Sunburn reduction using Surround WP

Pest Code:				Sunburn	
Pest Name:				Sunburn	
Crop Code:				MABSD	
BBCH Scale:				BPOM	
Crop Name:				Apple	
Description:				# Fruit w/sunburn	
Part Rated:				Fruit C	
Rating Date:				9/30/2008	
Rating Date Type:				Sunburn	
Sample Size:				400	
Sample Size Unit:				Fruit	
Days After First/Last Application:				95 18	
Trt. No.	Treatment Name	Product Rate	Product Rate Unit	1	2
1	Untreated			162.75a	40.75a
2	Surround			53.00c	13.50c
	Surround				
3	Raynox			92.75b	23.50b
4	Eclipse			110.75b	27.75b
LSD (P=.05)				27.968	7.010
Standard Deviation				21.578	5.408
CV				20.59	20.51
Grand Mean				104.81	26.38
Bartlett's X2				2.2522	1.711
P(Bartlett's X2)				0.522	0.635
Friedman's X2				11.1	11.1
P(Friedman's X2)				0.011	0.011

Means followed by same letter do not significantly differ (P=.10, Duncan's New MRT).