

## Holden Research and Consulting

**The use of a World Soil Solutions Program in addition to a grower standard program for the production of Strawberries**

Trial ID: 11strawcwss01  
Location: Camarillo, CA

Protocol ID: 11strawcwss01  
Study Director: Wells Hampton  
Investigator: David Holden

### General Trial Information

**Study Director:** Wells Hampton  
**Affiliation:** World Soil Solutions  
**Investigator:** David Holden  
**Affiliation:** Holden Research and Consulting

### Trial Location

**City:** Ventura  
**State/Prov.:** CA

**Trial Status:** ONE-YEAR/FINAL  
**Trial Reliability:** Strong  
**Initiation Date:** 10/3/11  
**Planned Completion Date:** 4/15/12

### Objectives:

To compare the growth and production effects from the use of a standard grower program to one enhanced with World Soil Solutions based product, BRIX.

### Conclusions:

#### Methods and Materials:

The block of Bennecia strawberries utilized for this trial was approximately 20 acres in size. This trial was set up as a demonstration non-replicated strip trial of two treatments with completely randomized data collection of six replicates maintained during the growing season in about .10 acre of this planting. The generalized treatment regimes can be found later in this report, but they were the grower standard (or untreated check) and an additional regime on top of the grower standard program that included World Soil Solutions BRIX product at a 2 quart per acre rate four times during the season. All applications of the BRIX treatment were made commencing approximately four weeks post transplant and every four weeks in the irrigation lines. These applications were all made through the growers installed drip irrigation system to the root zone of the growing plants. A fertilizer injection system was used to pump the material into the growers irrigation system during normal irrigation schedules.

In season leaf analysis, were also taken and analyzed by A&L Western Laboratories of Modesto, California.

Plants were also visually analyzed for any adverse effects from the application of the Summittgold program during the trial.

### Results and Discussion:

All data for this trial will be found in this report, represented in the attached Charts 1 - 13, and in the accompanying A&L Lab reports.

Charts 1-4 present initial and later data for the two treatments in regards to plant development and growth during the season. Charts 1 and 1a shows the average weights of sampled plants for both the whole plant and the removed roots during the first three months of growth. This data generally shows a numerical advantage in whole plant weight and root weight over time for the BRIX treated crop, with significant differences noted for both the whole plant and root weights on different read dates. Chart 2 shows the early bloom and fruit development over time, with significant differences observed in favor of the BRIX program on the first read date. All readings were numerically better for the BRIX program over time. Charts 3 and 4 represent both the average crown (the point from which the new leaves and bloom come out) development and plant vigor (plants rated on a scale of 1-5, a one being the healthiest) on the dates indicated. In both cases the BRIX treated plants were significantly better than the grower standard plants on the first reading date, but generally found to be no different on subsequent reading dates. Both of these ratings were based on the analysis of 4 plants per replicate.

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Charts 5-13 tracks all marketable production for all picks commencing on January 5, 2012 and ending April 9, 2012. Charts 5 and 6 shows the marketable production in calibrated trays per acre for each treatment for each pick day both on a daily and cumulative basis. As can be seen in Chart 6 the BRIX treatment program exceeded the grower standard production results during this trial period by 203 flats. A clearer perspective of how the rated production affected final grower returns is shown in Charts 7 and 8 which show the daily marketable returns based on USDA Shipping Point Market Prices found at [HTTP://marketnews.usda.gov/portal](http://marketnews.usda.gov/portal) for each pick day. This data is represented as the net back to grower after costs of approximately \$6.00 per tray were removed that would represent picking labor, carton and tray costs, transportation to the cooler, and cooling costs associated with picking the strawberries. Based on this data (and shown again in Charts 11 and 12), the cumulative return on investment (not taking the cost of the material or labor out of the equation) for these applications showed a net increase to the growers bottom line of over \$1185 per acre. Chart 9 shows the daily market utilization for the berries picked during the season, that is the percent of marketable berries to the total weight of berries picked. On average the BRIX treated strawberries had a better market utilization ratio during the season, averaging 78.6%, while the grower standard program averaged 75.4%. Chart 10 shows the mean weight per marketable fruit during the season. Again on average the BRIX treated berries were found to be heavier during the course of the trial weighing in at 29.6 grams apiece when compared to the grower standard berries at 26.6 grams. Chart 11 show the net differential in returns to the farm for the BRIX program over the grower standard. As can be seen in this chart, the BRIX program provided significant increases in grower returns on a per acre basis. Charts 12 shows the average net return to the grower at two times during the growing season. As can be seen in this trial utilization of the BRIX based program yielded positive returns to the grower by early-season (February 24th.), which continued to get better toward the end of the pick season (April 9th.). Finally Chart 13 consolidates the estimated net return per flat prices paid back to the grower during this trial.

A few other pieces of data that were not charted but collected will be discussed here. Leaf chlorophyll content as rated by a Minolta SPAD meter which reads the amount of light being conducted through the leaves showed significantly higher chlorophyll levels (data column 8) for the December 2, 2011 reading date for the BRIX treatments and numerically higher (column 15) for the BRIX treatments on the December 13, 2011 reading date. Brix readings for the harvested fruit were also collected on February 17 (data column 28) and April 2, 2012 (data column 29). Both reading dates showed higher Brix levels in the harvested fruit for the BRIX treated fruit and significantly so for the second reading date. Finally storage analysis of the harvested fruit was collected on two different pick dates. Fruit was picked and stored at ambient temperatures, then rated for in-storage breakdown at 4 and 7 days post pick. The fruit was rated as the percent unmarketable due to storage diseases and general internal breakdown (dessication, etc). This data for both analysis can be found in columns 30-47. In general no differences were noted in this storage data between the grower standard treated fruit and that fruit that was treated in the BRIX program.

Plant analysis for both treatments can be found in the attached lab analysis reports. The leaf analysis data for these samples showed no significant differences between treatments, but the BRIX treated plants (Code WSSSR) tended to trend a little lower on this rating date. But since crop load does have an effect on leaf nutrient levels this could be attributed to a higher fruit and flower load as the crop approached harvest on this date.

All data rated as significant was done so utilizing the New Duncan's Multiple Test Range at a 90% confidence level.

### Conclusions:

Based on both production results and market analysis it would appear that the use of a World Soil Solutions BRIX based program would yield significant economic benefit to growers with the apparent results due to the benefits provided by these materials in increased vigor and production of the treated plants.

Cooperator/Landowner

Organization: Terry Farms

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Crop Description	
Crop 1: FRASS Fragaria sp.	Strawberry
Variety: Bennicia	
BBCH Scale: BSTR	Planting Date: 10/3/11

Site and Design	
Plot Width, Unit: 2.5 FT	
Plot Length, Unit: 330 FT	
Replications: 6	Study Design: Completely Randomized

Application Description				
	A	B	C	D
Application Date:	10/26/11	11/28/11	12/15/11	1/7/12
Time of Day:	1300	1045	1045	1200
Application Method:	IRRIGA	IRRIGA	IRRIGA	IRRIGA
Application Placement:	WATER	WATER	WATER	WATER
Applied By:	Holden	Holden	Holden	Holden
Air Temperature, Unit:	68 F	70 F	55 F	58 F
% Relative Humidity:	50	50	50	90
Wind Velocity, Unit:	3 mph	3 mph	3 mph	2 mph
Wind Direction:	w	w	e	2
% Cloud Cover:	0	0	50	50

Crop Stage At Each Application				
	A	B	C	D
Crop 1 Code, BBCH Scale:	FRASS BSTR	FRASS BSTR	FRASS BSTR	FRASS BSTR

Application Equipment				
	A	B	C	D
Appl. Equipment:	Hypro Pump	Hypro Pump	Hypro Pump	Hypro Pump

Trt No Treatment Application Comment  
 1 No negative effects noticed with the use of the BRIX products. Mixes very well. No line clogging noted.



### Holden Research and Consulting

Pest Type	FRASS BSTR Strawberry Bennicia	FRASS BSTR Strawberry Bennicia	FRASS BSTR Strawberry Bennicia	FRASS BSTR Strawberry Bennicia	FRASS BSTR Strawberry Bennicia	FRASS BSTR Strawberry Bennicia				
Crop Code										
BBCH Scale										
Crop Name										
Crop Variety										
Description	FLOWER C	CONIDI C	PLATOT C	ROOT C	SHOOT C	FLOWER C				
Part Rated	12/2/11	12/2/11	12/2/11	12/2/11	12/2/11	12/8/11				
Rating Date										
Rating Data Type	COPLPA	CONDOC	WEIFRE	WEIFRE	WEIFRE	COPLPA				
Rating Unit	NUMBER	NUMBER	G	G	G	NUMBER				
Sample Size	10	4	1	1	1	10				
Sample Size Unit	Plant	LEAF	Plant	Plant	Plant	Plant				
Collection Basis	1	1				1				
Collection Basis Unit	PLANT	PLANT				PLANT				
Number of Subsamples	1	1	1	1	1	1				
Crop Stage										
Crop Stage Scale										
Crop Density, Unit										
Footnote Number			1	1	1					
Assessed By			Shelton	Shelton	Shelton					
Days After First/Last Applic.	37 4	37 4	37 4	37 4	37 4	43 10				
Tri-Eval Interval			37 DA-A	37 DA-A	37 DA-A					
Plant-Eval Interval	60 DP-1	60 DP-1	60 DP-1	60 DP-1	60 DP-1	66 DP-1				
ARM Action Codes					T3					
Number of Decimals			1	1	1					
Trt No.	7	8	9	10	11	12				
Treatment Name										
Other Rate										
Other Rate Unit										
Appl Code										
Appl Description										
1	Grower Standard	100 percent	Grower Standard	starter	0.07 b	49.98 b	21.3 b	4.9 a	16.4 b	0.12 b
2	Grower Standard	100 percent	Grower Standard	starter	0.32 a	53.40 a	30.6 a	6.2 a	24.4 a	0.62 a
	WSS1012	2 qt/a	A	Close to planting						
	WSS1012	2 qt/a	BCD	every 3 weeks 3x						
LSD (P=.10)	0.105	2.794	5.11	1.71	4.31	0.233				
Standard Deviation	0.101	2.670	4.89	1.63	4.12	0.223				
CV	52.61	5.17	18.82	29.34	20.19	60.78				
Bartlett's X2	0.601	0.175	0.587	3.503	0.657	3.549				
P(Bartlett's X2)	0.438	0.676	0.443	0.061	0.418	0.06				
Treatment F	18.443	4.912	10.785	1.858	11.264	15.101				
Treatment Prob(F)	0.0016	0.0510	0.0082	0.2027	0.0073	0.0030				

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

### Holden Research and Consulting

Pest Type	D Disease	D Disease	FRASS	FRASS	FRASS	D Disease
Crop Code	FRASS	FRASS	FRASS	FRASS	FRASS	FRASS
BBCB Scale	BSTR	BSTR	BSTR	BSTR	BSTR	BSTR
Crop Name	Strawberry	Strawberry	Strawberry	Strawberry	Strawberry	Strawberry
Crop Variety	Bennicia	Bennicia	Bennicia	Bennicia	Bennicia	Bennicia
Description	PLATOT C	PLATOT C	CONIDI C	FLOWER C	FLOWER C	PLATOT C
Part Rated	12/8/11	12/8/11	12/13/11	12/13/11	12/21/11	12/21/11
Rating Date	VIGOR	CROWN	CONDUCT	COPLPA	COPLPA	VIGOR
Rating Data Type	0-5	0-5	NUMBER	NUMBER	NUMBER	0-5
Rating Unit	10	10	4	10	10	6
Sample Size	PLANT	PLANT	LEAF	Plant	Plant	PLANT
Sample Size Unit			1	1	1	
Collection Basis			PLANT	PLANT	PLANT	
Collection Basis Unit			1	1	1	
Number of Subsamples	10	10	1	1	1	6
Crop Stage						
Crop Stage Scale						
Crop Density, Unit						
Footnote Number	1	1				1
Assessed By	Shelton	Shelton				Shelton
Days After First/Last Applic.	43 10	43 10	48 15	48 15	56 6	56 6
Tri-Eval Interval	22 DA-A	22 DA-A				6 DA-C
Plant-Eval Interval	66 DP-1	66 DP-1	71 DP-1	71 DP-1	79 DP-1	79 DP-1
ARM Action Codes						
Number of Decimals						
Tri Treatment	Other	Other	Appl	Appl		
No. Name	Rate	Rate	Unit	Code	Description	
13						18
1	100	percent			Grower Standard starter	3.6 a
2	100	percent			Grower Standard starter	3.6 a
	2	qt/a	A		Close to planting	
	2	qt/a	BCD		every 3 weeks 3x	
LSD (P=.10)	0.33	0.32	3.089	0.321	0.184	0.32
Standard Deviation	0.32	0.30	2.953	0.307	0.176	0.30
CV	9.57	22.3	5.49	39.21	19.69	8.41
Bartlett's X2	0.053	0.238	1.12	1.209	0.074	0.468
P(Bartlett's X2)	0.819	0.626	0.29	0.272	0.785	0.494
Treatment F	6.065	4.448	1.265	2.261	0.676	0.102
Treatment Prob(F)	0.0335	0.0611	0.2870	0.1635	0.4302	0.7560

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

### Holden Research and Consulting

Pest Type	D Disease	FRASS	FRASS	FRASS	FRASS	FRASS	FRASS				
Crop Code	FRASS	BSTR	BSTR	BSTR	BSTR	BSTR	BSTR				
BBCH Scale	BSTR	BSTR	BSTR	BSTR	BSTR	BSTR	BSTR				
Crop Name	Strawberry	Strawberry	Strawberry	Strawberry	Strawberry	Strawberry	Strawberry				
Crop Variety	Bennicia	Bennicia	Bennicia	Bennicia	Bennicia	Bennicia	Bennicia				
Description											
Part Rated	PLATOT C	PLATOT C	ROOT C	SHOOT C	FLOWER C	FRUIT C					
Rating Date	12/21/11	12/29/11	12/29/11	12/29/11	12/29/11	12/29/11	12/29/11				
Rating Data Type	CROWN	WEIFRE	WEIFRE	WEIFRE	COPLPA	COPLPA	COPLPA				
Rating Unit	0-5	G	G	G	NUMBER	NUMBER	NUMBER				
Sample Size	6	1	1	1	10	10	10				
Sample Size Unit	PLANT	Plant	Plant	Plant	Plant	Plant	Plant				
Collection Basis					1	1	1				
Collection Basis Unit					PLANT	PLANT	PLANT				
Number of Subsamples	6	1	1	1	1	1	1				
Crop Stage											
Crop Stage Scale											
Crop Density, Unit											
Footnote Number	1	1	1	1							
Assessed By	Shelton	Shelton	Shelton	Shelton	Shelton	Shelton	Shelton				
Days After First/Last Applic.	56 6	64 14	64 14	64 14	64 14	64 14	64 14				
Tri-Eval Interval	6 DA-C	14 DA-C	14 DA-C	14 DA-C	14 DA-C	14 DA-C	14 DA-C				
Plant-Eval Interval	79 DP-1	87 DP-1	87 DP-1	87 DP-1	87 DP-1	87 DP-1	87 DP-1				
ARM Action Codes					TS						
Number of Decimals		1	1	1	1						
Tri Treatment No.	Other Rate	Other Rate	Appl Unit	Appl Code	Appl Description	19	20	21	22	23	24
1	Grower Standard	100 percent			Grower Standard starter	1.6 a	47.7 a	5.2 a	42.5 a	0.73 a	2.02 a
2	Grower Standard	100 percent			Grower Standard starter	1.6 a	46.0 a	6.4 a	39.6 a	0.72 a	2.28 a
	WSS1012	2 qt/a	A		Close to planting						
	WSS1012	2 qt/a	BCD		every 3 weeks 3x						
LSD (P=.10)						0.29	11.43	1.41	11.65	0.220	0.284
Standard Deviation						0.28	10.93	1.34	11.13	0.210	0.271
CV						17.41	23.33	23.28	27.11	28.99	12.62
Bartlett's X2						0.547	0.001	0.417	0.012	0.104	1.663
P(Bartlett's X2)						0.46	0.97	0.518	0.914	0.747	0.197
Treatment F						0.118	0.075	2.195	0.201	0.019	2.896
Treatment Prob(F)						0.7387	0.7891	0.1693	0.6633	0.8935	0.1196

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

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Pest Type	FRASS BSTR	D Disease FRASS BSTR	D Disease FRASS BSTR	FRASS BSTR	FRASS BSTR	D Disease FRASS BSTR
Crop Code	Strawberry	Strawberry	Strawberry	Strawberry	Strawberry	Strawberry
BBCH Scale	Total for D>	Bennicia	Bennicia			Bennicia
Crop Name						
Crop Variety						
Description						4 day post >
Part Rated	FRUIT C	PLATOT C	PLATOT C	FRUIT C	FRUIT C	FRUROT C
Rating Date	12/29/11	2/10/12	2/10/12	2/17/12	4/2/12	2/20/12
Rating Data Type	COPLPA	VIGOR	CROWN	SUGCON	SUGCON	Dessication
Rating Unit	NUMBER	0-5	NUMBER	NUMBER	NUMBER	%
Sample Size	10	6	6	2	2	6
Sample Size Unit	Plant	PLANT	PLANT	Plant	Plant	PLANT
Collection Basis	1			1	1	
Collection Basis Unit	PLANT			PLANT	PLANT	
Number of Subsamples	1	6	6	1	1	1
Crop Stage						
Crop Stage Scale						
Crop Density, Unit						
Footnote Number		1	1			2
Assessed By	Shelton	Shelton	Shelton	Shelton	Shelton	Shelton
Days After First/Last Applic.	64 14	107 14	107 14	114 41	159 86	117 44
Trt-Eval Interval	14 DA-C	22 DA-A	22 DA-A	14 DA-C	14 DA-C	22 DA-A
Plant-Eval Interval	87 DP-1	130 DP-1	130 DP-1	137 DP-1	182 DP-1	140 DP-1
ARM Action Codes	T4					
Number of Decimals						0
Trt Treatment	Other Rate	Other Rate Unit	Appl Code	Appl Description		
No. Name					25	26
1 Grower Standard	100 percent			Grower Standard starter	2.75 a	5.0 a
2 Grower Standard	100 percent			Grower Standard starter	3.00 a	5.0 a
WSS1012	2 qt/a	A		Close to planting	6.2 a	6.0 a
WSS1012	2 qt/a	BCD		every 3 weeks 3x	9.93 a	10.47 a
					10.13 b	11.07 a
					28 a	24 a
LSD (P=.10)	0.295	0.00			0.74	0.564
Standard Deviation	0.282	0.00			0.71	0.539
CV	9.81	0.0			11.69	5.29
Bartlett's X2	0.607	0.0			1.335	0.302
P(Bartlett's X2)	0.436	.			0.248	0.583
Treatment F	2.358	0.000			0.165	2.935
Treatment Prob(F)	0.1556	1.0000			0.6933	0.1174
					12.403	0.0055
					0.301	0.5954

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





### Holden Research and Consulting

Pest Type	D Disease	D Disease	D Disease	D Disease	D Disease	D Disease
Crop Code	FRASS	FRASS	FRASS	FRASS	FRASS	FRASS
BBCH Scale	BSTR	BSTR	BSTR	BSTR	BSTR	BSTR
Crop Name	Strawberry	Strawberry	Strawberry	Strawberry	Strawberry	Strawberry
Crop Variety	Bennicia	Bennicia	Bennicia	Bennicia	Bennicia	Bennicia
Description	Total	Cumulative	4 day post >	4 day post >	4 day post >	Total
Part Rated	PLATOT C	PLATOT C	FRUROT C	FRUIT C	PLATOT C	PLATOT C
Rating Date	2/23/12	2/23/12	4/10/12	4/10/12	4/10/12	4/10/12
Rating Data Type	All	All	Dessication	Botrytis Mo	Mucor Mold	All
Rating Unit	%	%	%	%	%	%
Sample Size	6	6	6	6	6	6
Sample Size Unit	PLANT	PLANT	PLANT	PLANT	PLANT	PLANT
Collection Basis						
Collection Basis Unit						
Number of Subsamples	1	1	1	1	1	1
Crop Stage						
Crop Stage Scale						
Crop Density, Unit						
Footnote Number	2	2	2	2	2	2
Assessed By	Shelton	Shelton	Shelton	Shelton	Shelton	Shelton
Days After First/Last Applic.	120 47	120 47	167 94	167 94	167 94	167 94
Trt-Eval Interval	40 DA-D	40 DA-D	22 DA-A	22 DA-A	22 DA-A	22 DA-A
Plant-Eval Interval	143 DP-1	143 DP-1	190 DP-1	190 DP-1	190 DP-1	190 DP-1
ARM Action Codes	T19	T20				T25
Number of Decimals	0	0	0	0	0	0
Trt No.	37	38	39	40	41	42
Treatment Name	Other Rate	Other Rate	Appl Unit	Appl Code	Appl Description	
1	Grower Standard	100 percent			Grower Standard starter	58 a
2	Grower Standard	100 percent			Grower Standard starter	55 a
	WSS1012	2 qt/a	A		Close to planting	86 a
	WSS1012	2 qt/a	BCD		every 3 weeks 3x	80 a
LSD (P=.10)	15.2	14.6	12.5	3.0	0.0	13.7
Standard Deviation	14.5	13.9	12.0	2.9	0.0	13.1
CV	25.62	16.71	27.75	186.19	0.0	29.16
Bartlett's X2	2.673	0.125	0.083	0.261	0.0	0.257
P(Bartlett's X2)	0.102	0.723	0.774	0.61		0.613
Treatment F	0.138	0.604	0.023	0.385	0.000	0.000
Treatment Prob(F)	0.7176	0.4550	0.8834	0.5490	1.0000	1.0000

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

# Holden Research and Consulting

Pest Type	D Disease	D Disease	D Disease	D Disease	D Disease	FRASS
Crop Code	FRASS	FRASS	FRASS	FRASS	FRASS	BSTR
BBCH Scale	BSTR	BSTR	BSTR	BSTR	BSTR	Strawberry
Crop Name	Strawberry	Strawberry	Strawberry	Strawberry	Strawberry	Beneclas
Crop Variety	Bennicia	Bennicia	Bennicia	Bennicia	Bennicia	
Description	7 day post >	7 day post >	7 day post >	Total	Cumulative	FRUMAR C
Part Rated	FRUROT C	FRUIT C	PLATOT C	PLATOT C	PLATOT C	1/5/12
Rating Date	4/13/12	4/13/12	4/13/12	4/13/12	4/13/12	Shelton
Rating Data Type	Dessication	Botrytis Mo	Mucor Mold	All	All	G
Rating Unit	%	%	%	%	%	10
Sample Size	6	6	6	6	6	PLANT
Sample Size Unit	PLANT	PLANT	PLANT	PLANT	PLANT	PLANT
Collection Basis						6
Collection Basis Unit						87
Number of Subsamples	1	1	1	1	1	BBCH
Crop Stage						1.33FT2
Crop Stage Scale						1
Crop Density, Unit	2	2	2	2	2	Shelton
Footnote Number	Shelton	Shelton	Shelton	Shelton	Shelton	71 21
Assessed By	170 97	170 97	170 97	170 97	170 97	21 DA-C
Days After First/Last Applic.	40 DA-D	40 DA-D	40 DA-D	40 DA-D	40 DA-D	94 DP-1
Trt-Eval Interval	193 DP-1	193 DP-1	193 DP-1	193 DP-1	193 DP-1	
Plant-Eval Interval				T26	T27	
ARM Action Codes				0	0	1
Number of Decimals	0	0	0	0	0	
Trt No.	43	44	45	46	47	48
Treatment Name	1 Grower Standard	2 Grower Standard	WSS1012	WSS1012		
Other Rate	100 percent	100 percent	2 qt/a	2 qt/a		
Other Rate Unit			A	BCD		
Appl Code						
Appl Description	Grower Standard starter	Grower Standard starter	Close to planting	every 3 weeks 3x		
	54 a	0 a	0 a	54 a	99 a	49.6 a
	53 a	0 a	0 a	53 a	98 a	62.5 a
LSD (P=.10)	13.2	0.0	0.0	13.2	4.2	28.10
Standard Deviation	12.6	0.0	0.0	12.6	4.0	26.86
CV	23.54	0.0	0.0	23.54	4.1	47.92
Bartlett's X2	0.305	0.0	0.0	0.305	2.125	0.125
P(Bartlett's X2)	0.581			0.581	0.145	0.724
Treatment F	0.020	0.000	0.000	0.020	0.200	0.694
Treatment Prob(F)	0.8892	1.0000	1.0000	0.8892	0.6643	0.4243

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

## Holden Research and Consulting

	FRASS BSTR Strawberry Benecias	FRASS BSTR Strawberry Benecias	FRASS BSTR Strawberry Benecias	FRASS BSTR Strawberry Benecias	FRASS BSTR Strawberry Benecias	FRASS BSTR Benecias Total Weight
	FRUMAR C	FRUMAR C	FRUUNM C	FRUUNM C	FRUUNM C	FRUMAR C
Pest Type						
Crop Code						
BBCH Scale						
Crop Name						
Crop Variety						
Description						
Part Rated						
Rating Date						
Rating Data Type	Shelton	Shelton	Shelton	Shelton	Shelton	Shelton
Rating Unit	NUMBER	g/fruit	G	NUMBER	g/fruit	G
Sample Size	10	10	10	10	10	10
Sample Size Unit	PLANT	PLANT	PLANT	PLANT	PLANT	PLANT
Collection Basis						
Collection Basis Unit	PLANT	PLANT	PLANT	PLANT	PLANT	PLANT
Number of Subsamples	6	6	6	6	6	6
Crop Stage	87	87	87	87	87	87
Crop Stage Scale	BBCH	BBCH	BBCH	BBCH	BBCH	BBCH
Crop Density, Unit						
Footnote Number	1	1	1	1	1	1
Assessed By	Shelton	Shelton	Shelton	Shelton	Shelton	Shelton
Days After First/Last Applic.						
Trt-Eval Interval						
Plant-Eval Interval	73 DP-1	73 DP-1	73 DP-1	73 DP-1	73 DP-1	73 DP-1
ARM Action Codes		T6			T7	T8
Number of Decimals	1	2	1	1	2	2
Trt Treatment No. Name	49	50	51	52	53	54
Other Rate						
Other Rate Unit						
Appl Code						
Appl Description						
1 Grower Standard	1.4 a	25.19 a	9.7 a	0.4 a	7.43 a	59.31 a
2 Grower Standard	1.8 a	30.27 a	8.3 a	0.3 a	4.84 a	70.83 a
WSS1012						
WSS1012						
LSD (P=.10)	0.86	9.612	15.11	0.48	8.379	34.257
Standard Deviation	0.82	9.188	14.44	0.46	8.009	32.746
CV	51.89	33.13	159.97	144.62	130.56	50.32
Bartlett's X2	0.012	1.2	0.556	0.587	0.062	0.428
P(Bartlett's X2)	0.914	0.273	0.456	0.444	0.803	0.513
Treatment F	0.494	0.920	0.028	0.271	0.314	0.372
Treatment Prob(F)	0.4983	0.3601	0.8710	0.6139	0.5874	0.5556

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

# Holden Research and Consulting

	FRASS BSTR Benecias	FRASS BSTR Strawberry Benecias	FRASS BSTR Strawberry Benecias	FRASS BSTR Strawberry Benecias	FRASS BSTR Strawberry Benecias	FRASS BSTR Strawberry Benecias
Pest Type	FRUMAR C	FRUMAR C	FRUMAR C	FRUMAR C	FRUUNM C	FRUUNM C
Crop Code	Shelton	Shelton	Shelton	Shelton	Shelton	Shelton
BBCH Scale	percent	G	NUMBER	g/fruit	G	NUMBER
Crop Name	10	10	10	10	10	10
Crop Variety	PLANT	PLANT	PLANT	PLANT	PLANT	PLANT
Description	PLANT	PLANT	PLANT	PLANT	PLANT	PLANT
Part Rated	6	6	6	6	6	6
Rating Date	87	87	87	87	87	87
Rating Data Type	BBCH	BBCH	BBCH	BBCH	BBCH	BBCH
Rating Unit	1	1	1	1	1	1
Sample Size	Shelton	Shelton	Shelton	Shelton	Shelton	Shelton
Sample Size Unit	96	23	23	23	23	23
Collection Basis	21 DA-C	21 DA-C	21 DA-C	21 DA-C	21 DA-C	21 DA-C
Collection Basis Unit	73 DP-1	119 DP-1	73 DP-1	73 DP-1	73 DP-1	73 DP-1
Number of Subsamples	T9			T10		
Crop Stage	3	1	1	2	1	1
Crop Stage Scale						
Crop Density, Unit						
Footnote Number						
Assessed By						
Days After First/Last Applic.						
Tri-Eval Interval						
Plant-Eval Interval						
ARM Action Codes						
Number of Decimals						
Tri Treatment No. Name	55	56	57	58	59	60
Other Rate						
Other Rate Unit						
Appl Code						
Appl Description						
1 Grower Standard	61.671 a	60.1 a	1.8 a	27.60 a	2.8 a	0.1 a
WSS1012						
WSS1012						
2 Grower Standard	76.072 a	73.3 a	1.9 a	30.35 a	0.8 a	0.0 a
WSS1012						
WSS1012						
LSD (P=.10)	22.2394	42.52	1.06	8.070	5.25	0.16
Standard Deviation	21.2582	40.64	1.01	7.714	5.02	0.15
CV	30.87	60.9	55.78	26.62	278.2	273.86
Bartlett's X2	0.207	1.101	0.824	0.215	5.686	4.865
P(Bartlett's X2)	0.649	0.294	0.364	0.643	0.017*	0.027*
Treatment F	1.377	0.316	0.056	0.383	0.450	0.400
Treatment Prob(F)	0.2678	0.5863	0.8174	0.5501	0.5177	0.5413

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

### Holden Research and Consulting

Pest Type	FRASS BSTR Strawberry Benecias	FRASS BSTR Benecias Total Weight	FRASS BSTR Benecias	FRASS BSTR Strawberry Benecias	FRASS BSTR Strawberry Benecias	FRASS BSTR Strawberry Benecias					
Crop Code											
BBCH Scale											
Crop Name											
Crop Variety											
Description											
Part Rated											
Rating Date											
Rating Data Type											
Rating Unit											
Sample Size											
Sample Size Unit											
Collection Basis											
Collection Basis Unit											
Number of Subsamples											
Crop Stage											
Crop Stage Scale											
Crop Density, Unit											
Footnote Number											
Assessed By											
Days After First/Last Applic.											
Trt-Eval Interval											
Plant-Eval Interval											
ARM Action Codes											
Number of Decimals											
Trt No.	Treatment Name	Other Rate	Other Rate Unit	Appl Code	Appl Description						
61											
62											
63											
64											
65											
66											
1	Grower Standard	100	percent		Grower Standard starter	2.08 a	62.92 a	79.167 a	88.8 a	2.6 a	27.23 a
2	Grower Standard WSS1012	100	percent		Grower Standard starter	0.83 a	74.17 a	77.111 a	100.4 a	2.7 a	28.44 a
	WSS1012	2	qt/a	A	Close to planting						
	WSS1012	2	qt/a	BCD	every 3 weeks 3x						
LSD (P=.10)		4.086				44.615	13.0669	71.52	1.92		12.319
Standard Deviation		3.886				42.646	12.4904	68.36	1.83		11.776
CV		266.5				62.22	15.98	72.28	69.83		42.3
Bartlett's X2		3.539				0.803	0.003	0.888	0.571		1.321
P(Bartlett's X2)		0.06				0.37	0.959	0.346	0.45		0.25
Treatment F		0.310				0.209	0.081	0.087	0.006		0.031
Treatment Prob(F)		0.5897				0.6575	0.7815	0.7736	0.9388		0.8630

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

### Holden Research and Consulting

Pest Type	FRASS BSTR	FRASS BSTR	FRASS BSTR	FRASS BSTR	FRASS BSTR	FRASS BSTR
Crop Code	Strawberry	Strawberry	Strawberry	Benecias	Benecias	Strawberry
BBCH Scale	Benecias	Benecias	Benecias	Total Weight	Benecias	Benecias
Crop Name						
Crop Variety						
Description						
Part Rated	FRUUNM C	FRUUNM C	FRUUNM C	FRUMAR C	FRUMAR C	FRUMAR C
Rating Date						3/9/12
Rating Data Type	Shelton	Shelton	Shelton	Shelton	Shelton	Shelton
Rating Unit	G	NUMBER	g/fruit	G	percent	G
Sample Size	10	10	10	10	10	10
Sample Size Unit	PLANT	PLANT	PLANT	PLANT	PLANT	PLANT
Collection Basis						
Collection Basis Unit	PLANT	PLANT	PLANT	PLANT	PLANT	PLANT
Number of Subsamples	6	6	6	6	6	6
Crop Stage	87	87	87	87	87	87
Crop Stage Scale	BBCH	BBCH	BBCH	BBCH	BBCH	BBCH
Crop Density, Unit						1.33FT2
Footnote Number	1	1	1	1	1	1
Assessed By	Shelton	Shelton	Shelton	Shelton	Shelton	Shelton
Days After First/Last Applic.						135 62
Tri-Eval Interval						21 DA-C
Plant-Eval Interval	73 DP-1	73 DP-1	73 DP-1	73 DP-1	73 DP-1	158 DP-1
ARM Action Codes			T15	T16	T17	
Number of Decimals	1	1	2	2	3	
Tri Treatment No. Name	67	68	69	70	71	72
Other Rate						
Other Rate						
Appl Unit						
Appl Code						
Appl Description						
1 Grower Standard	100 percent			88.75 a	80.556 a	65.1 a
2 Grower Standard	100 percent			100.42 a	75.000 a	81.8 a
WSS1012	2 qt/a	A				
WSS1012	2 qt/a	BCD	every 3 weeks 3x			
LSD (P=.10)	0.00	0.00	0.000	71.520	33.2352	40.17
Standard Deviation	0.00	0.00	0.000	68.364	31.7688	38.40
CV	0.0	0.0	0.0	72.28	40.85	52.26
Bartlett's X2	0.0	0.0	0.0	0.888	0.847	0.044
P(Bartlett's X2)				0.346	0.357	0.834
Treatment F	0.000	0.000	0.000	0.087	0.092	0.565
Treatment Prob(F)	1.0000	1.0000	1.0000	0.7736	0.7682	0.4695

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

### Holden Research and Consulting

Pest Type	FRASS BSTR Strawberry Benecias	FRASS BSTR Strawberry Benecias	FRASS BSTR Strawberry Benecias	FRASS BSTR Strawberry Benecias	FRASS BSTR Strawberry Benecias	FRASS BSTR Benecias Total Weight
Crop Code	FRUMAR C	FRUMAR C	FRUJNM C	FRUJNM C	FRUJNM C	FRUMAR C
BBCH Scale	Shelton	Shelton	Shelton	Shelton	Shelton	Shelton
Crop Name	NUMBER	g/fruit	G	NUMBER	g/fruit	G
Crop Variety	10	10	10	10	10	10
Description	PLANT	PLANT	PLANT	PLANT	PLANT	PLANT
Part Rated	PLANT	PLANT	PLANT	PLANT	PLANT	PLANT
Rating Date	PLANT	PLANT	PLANT	PLANT	PLANT	PLANT
Rating Data Type	6	6	6	6	6	6
Rating Unit	87	87	87	87	87	87
Sample Size	BBCH	BBCH	BBCH	BBCH	BBCH	BBCH
Sample Size Unit	1	1	1	1	1	1
Collection Basis	Shelton	Shelton	Shelton	Shelton	Shelton	Shelton
Collection Basis Unit	73 DP-1	73 DP-1	73 DP-1	73 DP-1	73 DP-1	73 DP-1
Number of Subsamples	T21	T21	T21	T21	T22	T23
Crop Stage	1	2	1	1	2	2
Crop Stage Scale	73	74	75	76	77	78
Crop Density, Unit	2.1 a	23.59 a	13.2 a	0.9 a	4.85 a	78.33 a
Footnote Number	2.7 a	27.91 a	10.7 a	0.8 a	3.28 a	92.50 a
Assessed By						
Days After First/Last Applic.						
Tri-Eval Interval						
Plant-Eval Interval						
ARM Action Codes						
Number of Decimals						
Trt No.	Treatment Name	Other Rate	Other Rate Unit	Appl Code	Appl Description	
1	Grower Standard	100 percent			Grower Standard starter	
2	Grower Standard WSS1012	100 percent	2 qt/a	A	Grower Standard starter Close to planting	
	WSS1012		2 qt/a	BCD	every 3 weeks 3x	
LSD (P=.10)		1.29				43.184
Standard Deviation		1.23				41.278
CV		51.47				48.33
Bartlett's X2		0.029				0.034
P(Bartlett's X2)		0.864				0.853
Treatment F		0.741				0.353
Treatment Prob(F)		0.4095				0.5654

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



## Holden Research and Consulting

Pest Type	FRASS		
Crop Code	BSTR		
BBCH Scale			
Crop Name	Benecias		
Crop Variety			
Description	FRUMAR C		
Part Rated			
Rating Date			
Rating Data Type	Shelton		
Rating Unit	percent		
Sample Size	10		
Sample Size Unit	PLANT		
Collection Basis			
Collection Basis Unit	PLANT		
Number of Subsamples	6		
Crop Stage	87		
Crop Stage Scale	BBCH		
Crop Density, Unit	1		
Footnote Number	Shelton		
Assessed By			
Days After First/Last Applic.			
Tri-Eval Interval	73 DP-1		
Plant-Eval Interval	T24		
ARM Action Codes	3		
Number of Decimals			
Trt Treatment No. Name	Other Rate Other Rate Unit Appl Code Appl Description		
1 Grower Standard	100 percent	Grower Standard starter	66.460 a
2 Grower Standard	100 percent	Grower Standard starter	83.527 a
WSS1012	2 qt/a	A Close to planting	
WSS1012	2 qt/a	BCD every 3 weeks 3x	
LSD (P=.10)	27.4769		
Standard Deviation	26.2646		
CV	35.02		
Bartlett's X2	0.836		
P(Bartlett's X2)	0.361		
Treatment F	1.267		
Treatment Prob(F)	0.2867		

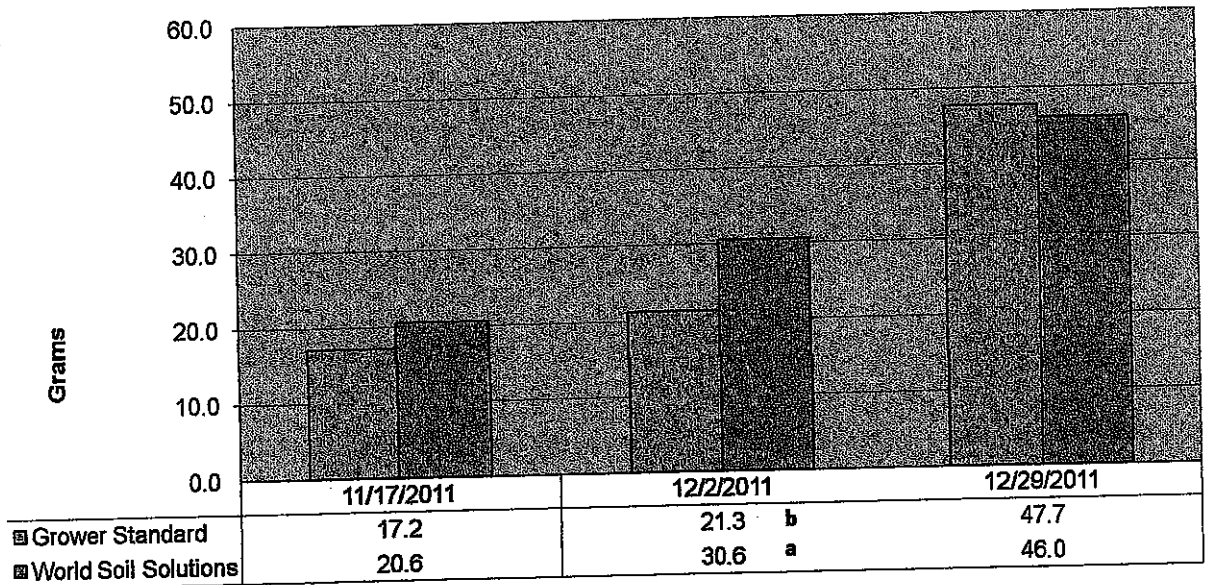
Means followed by same letter do not significantly differ (P=.10, Duncan's New MRT)

## ARM Action Codes

T1 = [C1]/1  
 T2 = [C4]/[C5]  
 T3 = [C9]/[C10]  
 T5 = [C20]/[C21]  
 T4 = [C23]+[C24]  
 T18 = [C30]+[C31]+[C32]  
 T19 = [C34]+[C35]+[C36]  
 T20 = [C33]+[C37]  
 T25 = [39]+[40]+[41]  
 T26 = [43]+[44]+[45]  
 T27 = [42]+[46]  
 T6 = [C48]/[C49]  
 T7 = [C51]/[C52]  
 T8 = [C48]+[C51]  
 T9 = ([C48]/[C54])\*100  
 T10 = [C56]/[C57]  
 T11 = [C59]/[C60]  
 T12 = [C56]+[C59]  
 T13 = ([C56]/[C62])\*100  
 T14 = [C64]/[C65]  
 T15 = [C67]/[C68]  
 T16 = [C64]+[C67]  
 T17 = ([C64]/[C70])\*100  
 T21 = [C72]/[C73]  
 T22 = [C75]/[C76]  
 T23 = [C72]+[C75]  
 T24 = ([C72]/[C78])\*100

Footnote 1: First pick 1/5/12

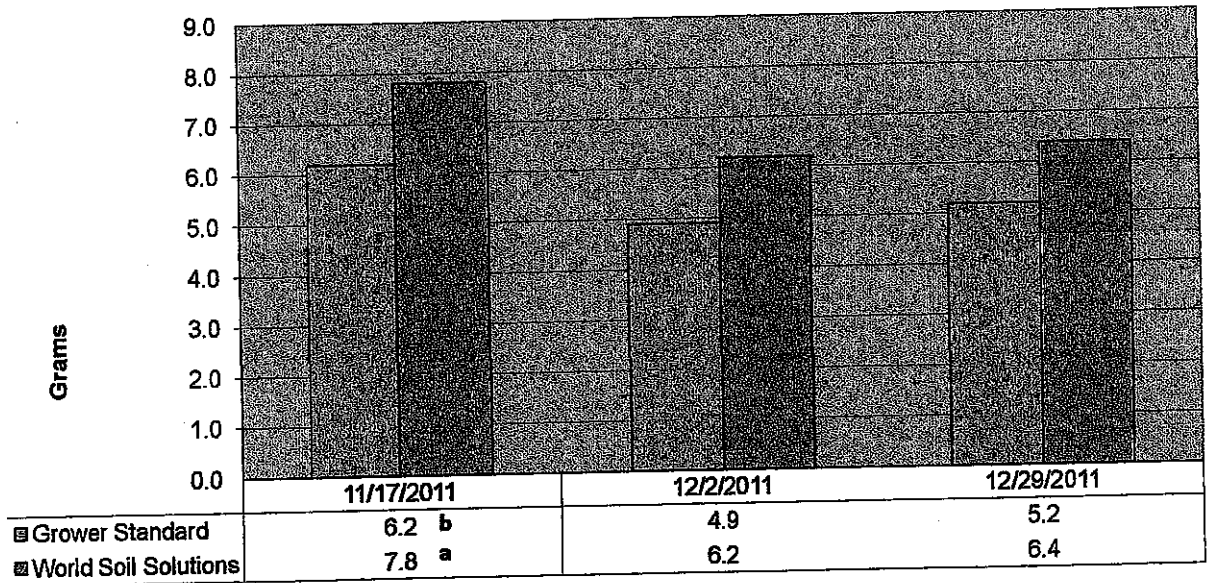
**Chart 1: World Soil Solutions in Strawberries - Ventura County, Fall/Winter 2011-2012 - Average Whole Plant Weight on Date Indicated**



Means followed by the same letter do not significantly differ (P=.10,NDMRT)

Holden Research and Consulting - David Holden

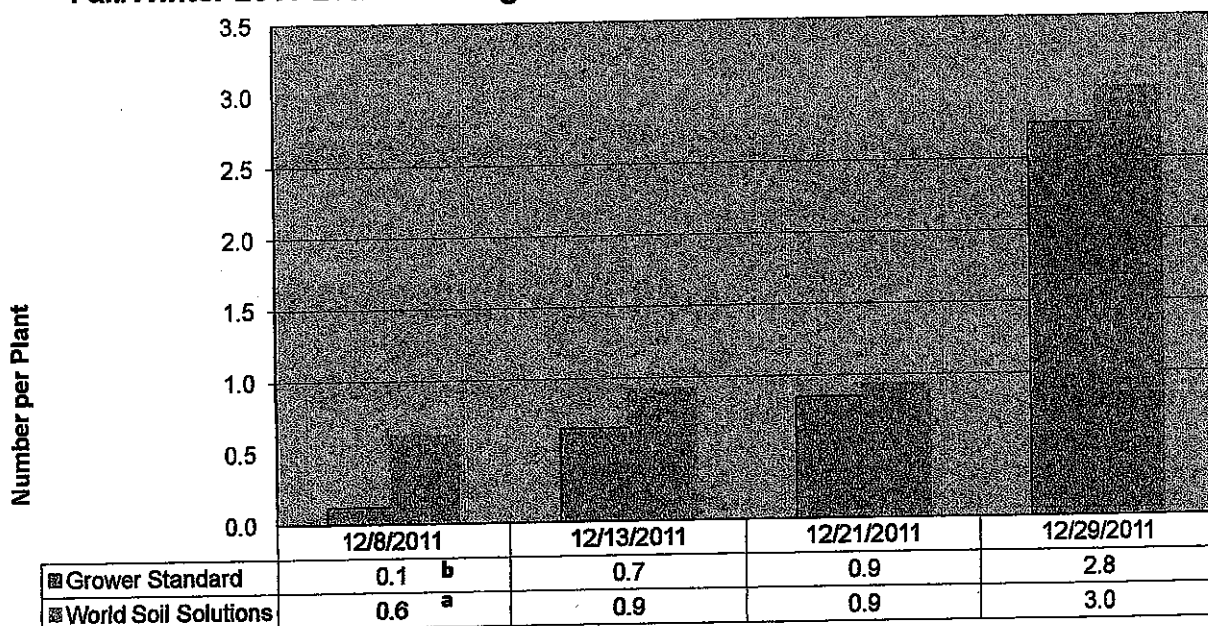
**Chart 1a: World Soil Solutions in Strawberries - Ventura County, Fall/Winter 2011-2012 - Average Root Weight on Date Indicated**



Means followed by the same letter do not significantly differ ( $P \geq .10$ , NDMRT)

Holden Research and Consulting - David Holden

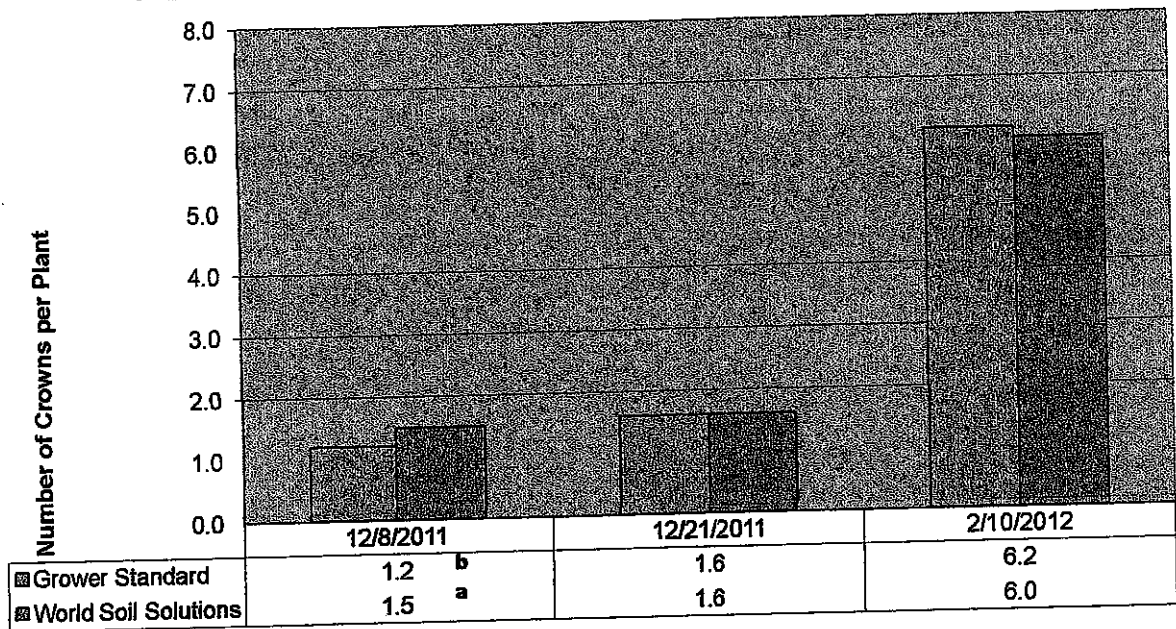
**Chart 2: World Soil Solutions in Strawberries - Ventura County, Fall/Winter 2011-2012 - Average Bloom and Fruit on dates indicated**



Means followed by the same letter do not significantly differ (P=.10,NDMRT)

Holden Research and Consulting - David Holden

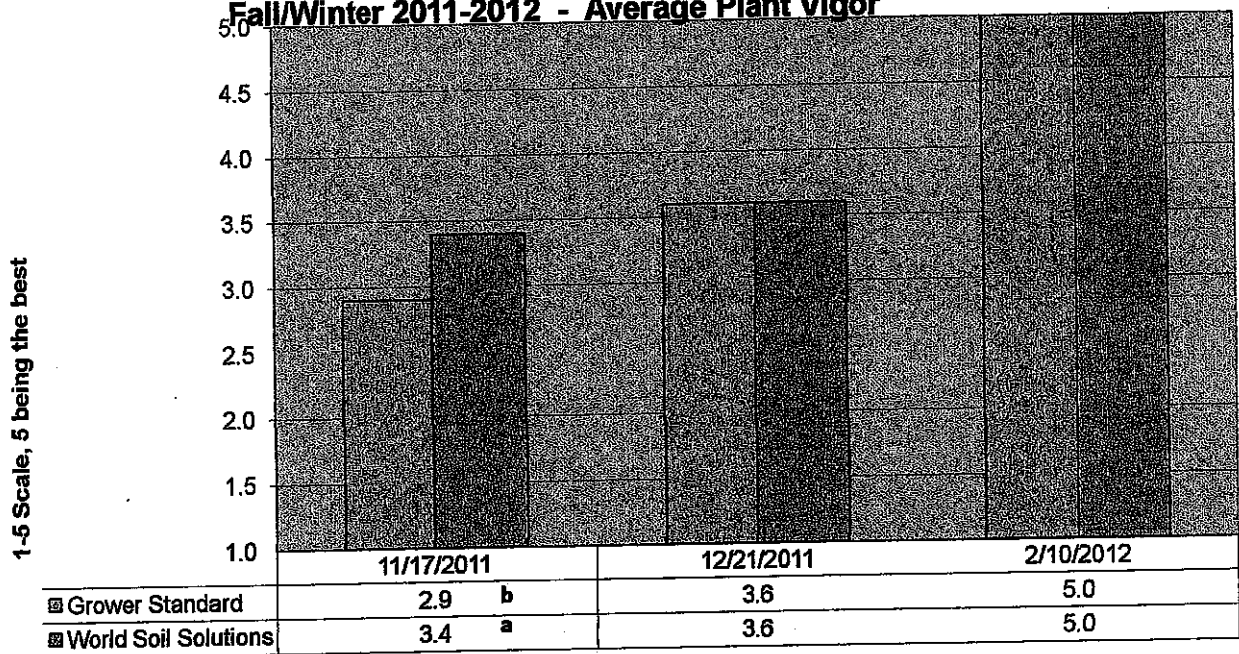
**Chart 3: World Soil Solutions in Strawberries - Ventura County, Fall/Winter 2011-2012 - Average Crown Development**



Means followed by the same letter do not significantly differ (P=.10,NDMRT)

Holden Research and Consulting - David Holden

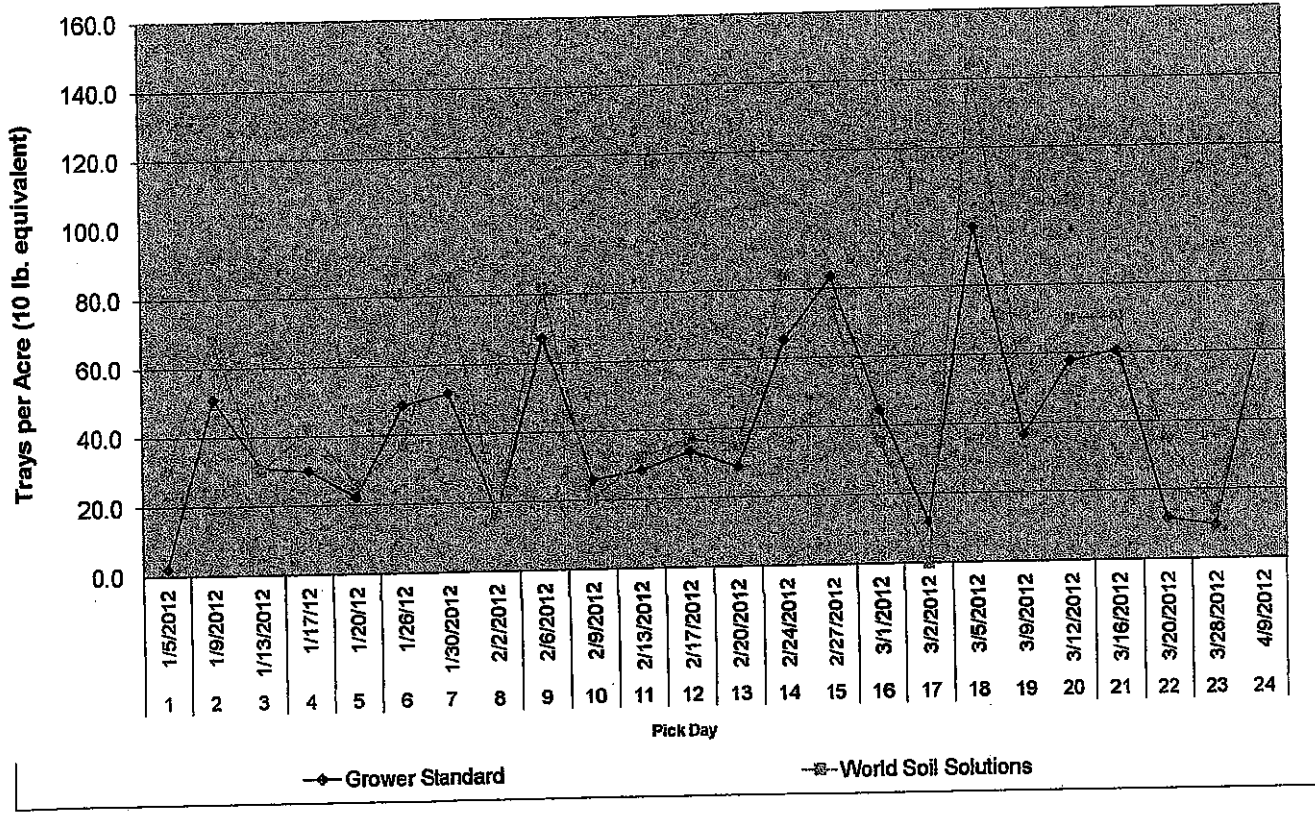
**Chart 4: World Soil Solutions in Strawberries - Ventura County, Fall/Winter 2011-2012 - Average Plant Vigor**



Means followed by the same letter do not significantly differ (P=.10,NDMRT)

Holden Research and Consulting - David Holden

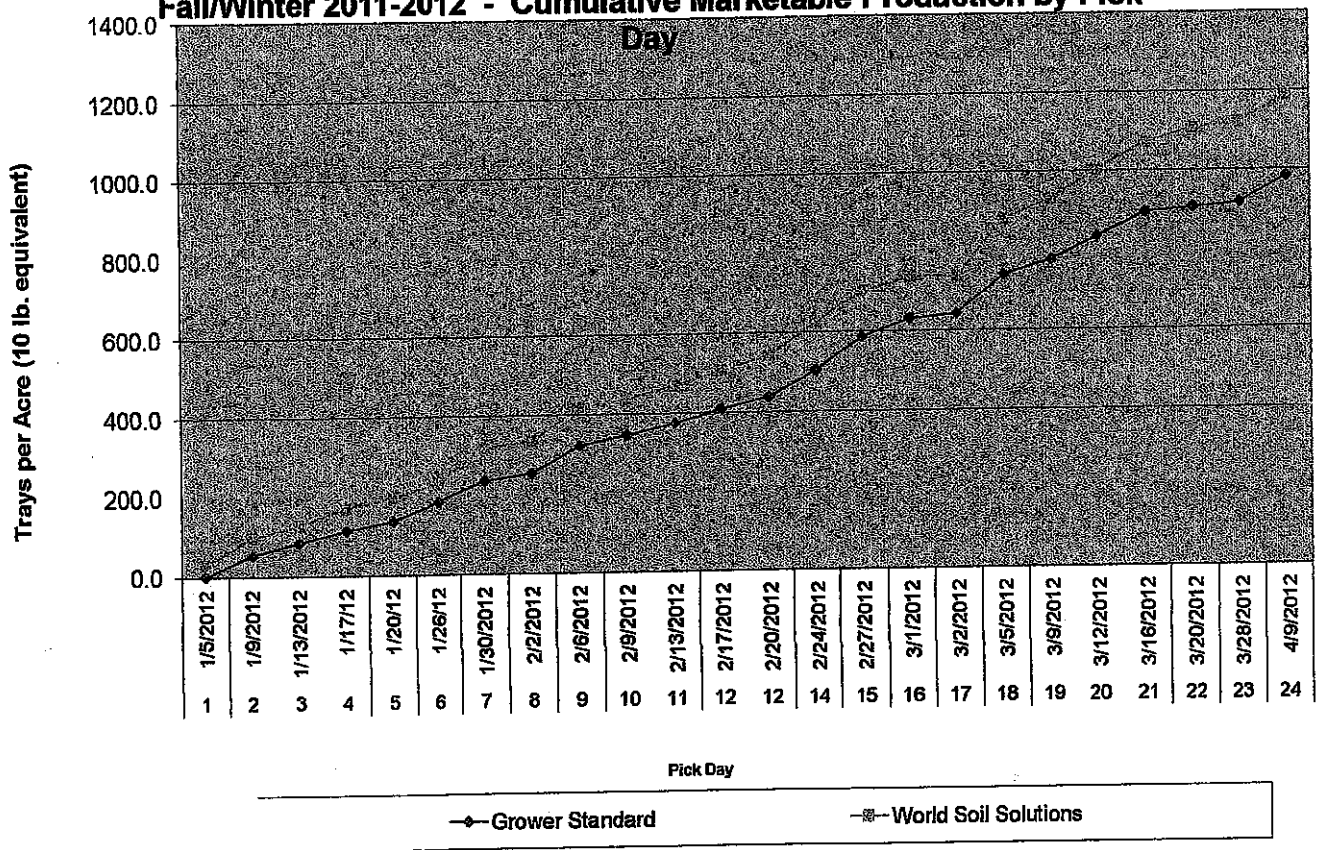
**Chart 5: World Soil Solutions in Strawberries - Ventura County, Fall/Winter 2011-2012 - Marketable Production by Pick Day**



Means followed by the same letter do not significantly differ (P=.10,NDMRT)

Holden Research and Consulting - David Holden

**Chart 6: World Soil Solutions in Strawberries - Ventura County, Fall/Winter 2011-2012 - Cumulative Marketable Production by Pick**

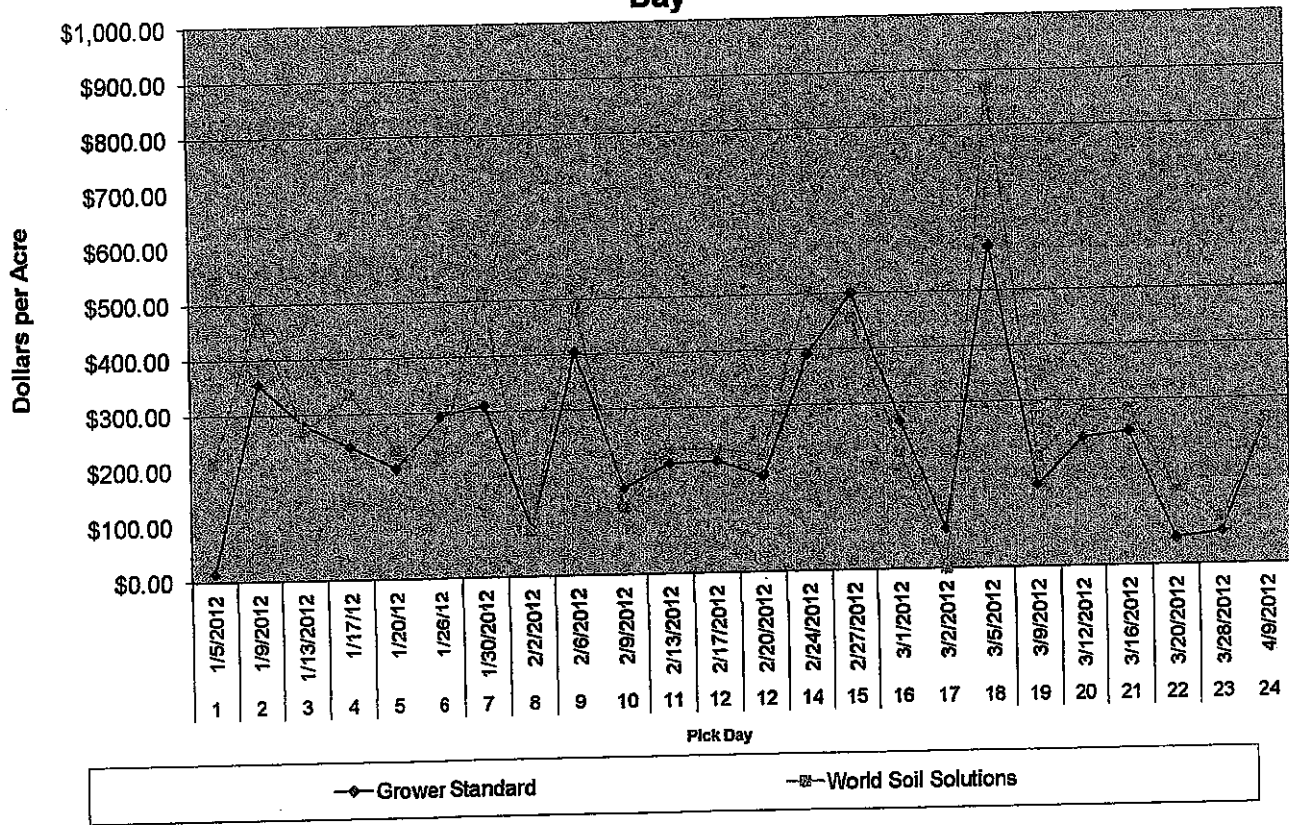


Means followed by the same letter do not significantly differ (P=.10,NDMRT)

Holden Research and Consulting - David Holden



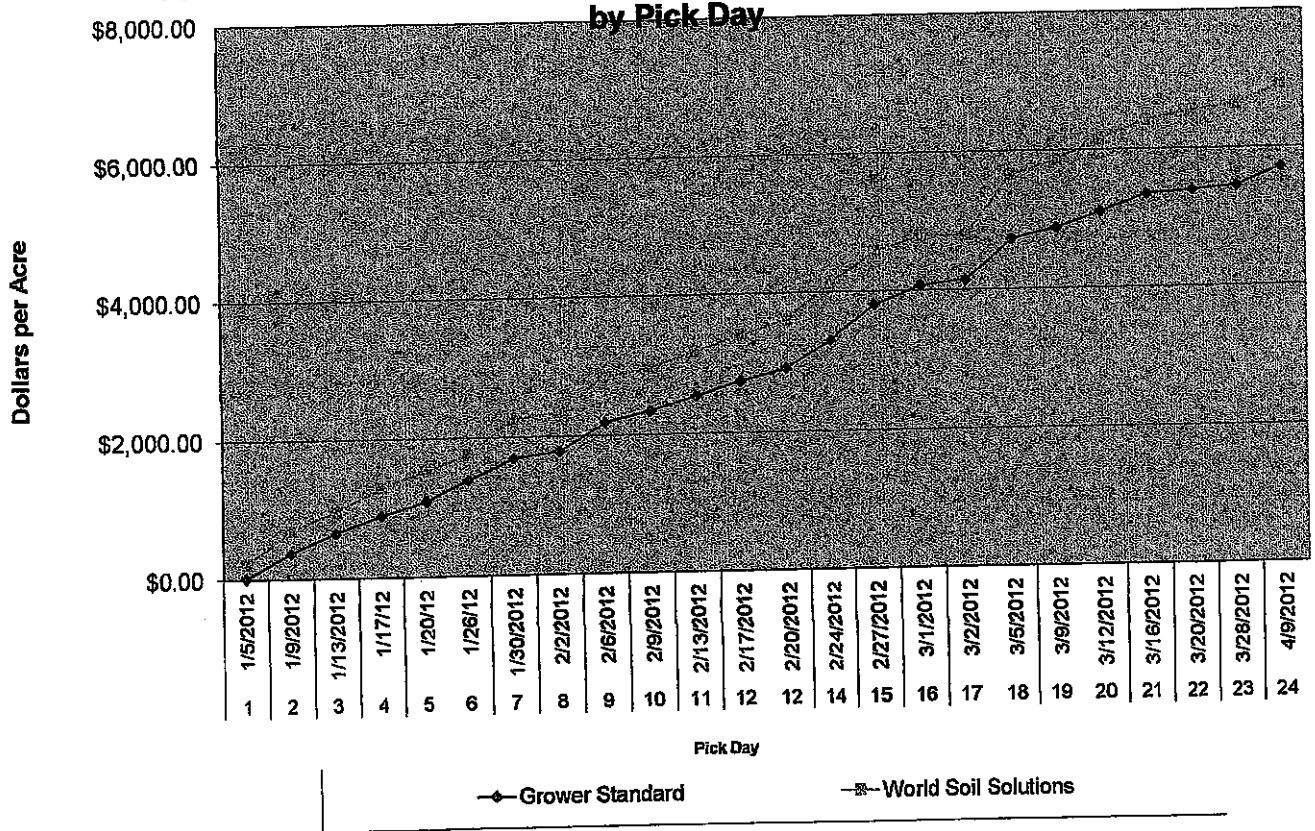
**Chart 7: World Soil Solutions in Strawberries - Ventura County, Fall/Winter 2011-2012 - Marketable Production Net Return by Pick Day**



Means followed by the same letter do not significantly differ (P=.10,NDMRT)

Holden Research and Consulting - David Holden

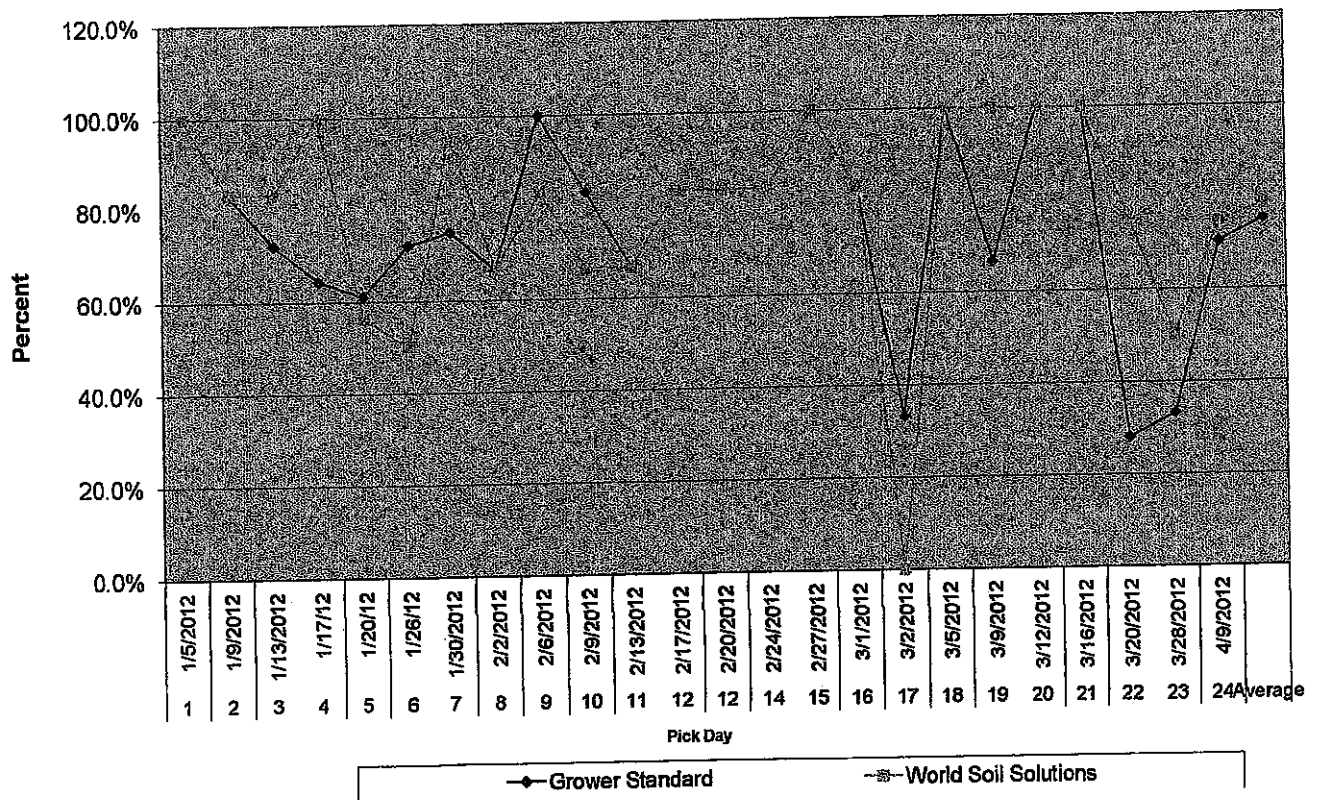
**Chart 8: World Soil Solutions in Strawberries - Ventura County,  
Fall/Winter 2011-2012 - Cumulative Marketable Production Net Return  
by Pick Day**



Means followed by the same letter do not significantly differ (P=.10,NDMRT)

Holden Research and Consulting - David Holden

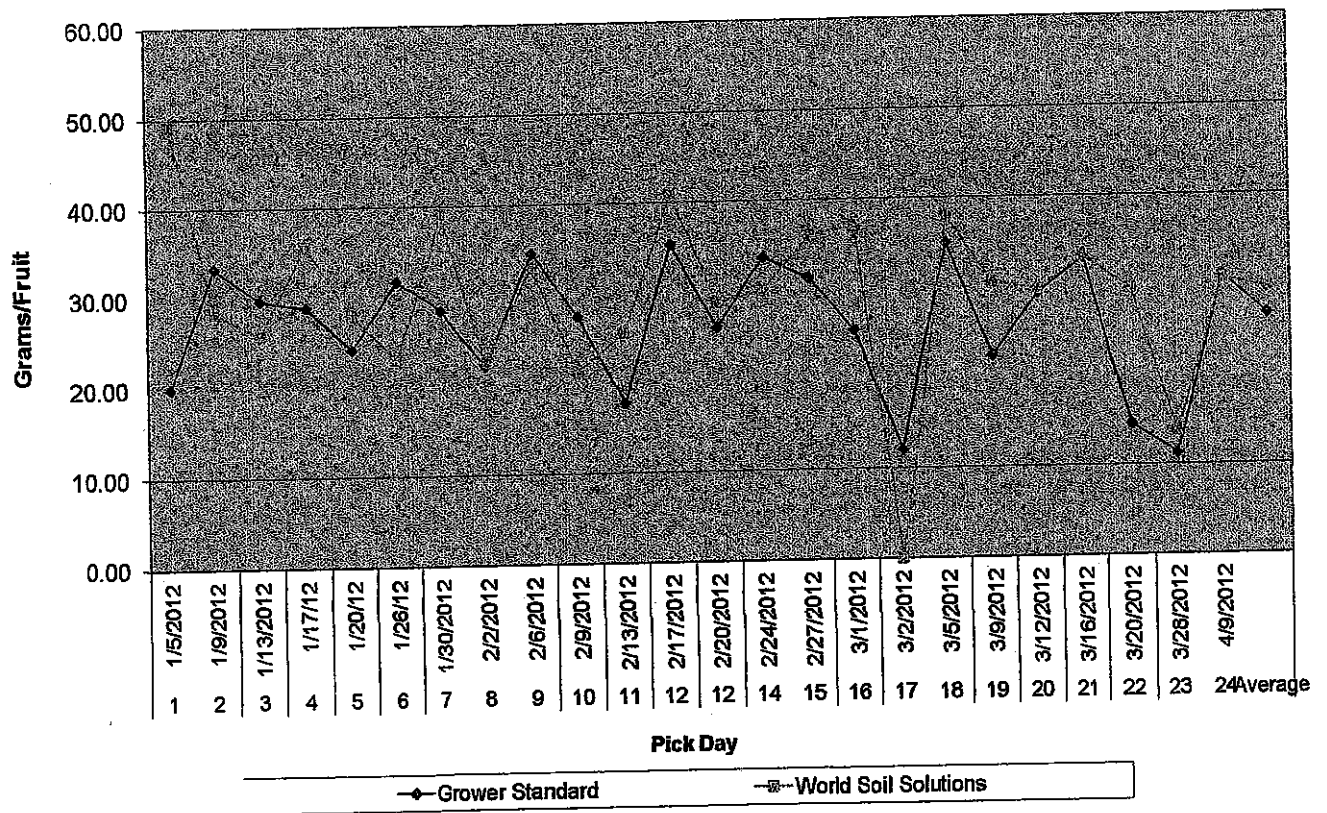
**Chart 9: World Soil Solutions in Strawberries - Ventura County, Fall/Winter 2011-2012 - Marketable Utilization by Pick Day**



Means followed by the same letter do not significantly differ (P=.10,NDMRT)

Holden Research and Consulting - David Holden

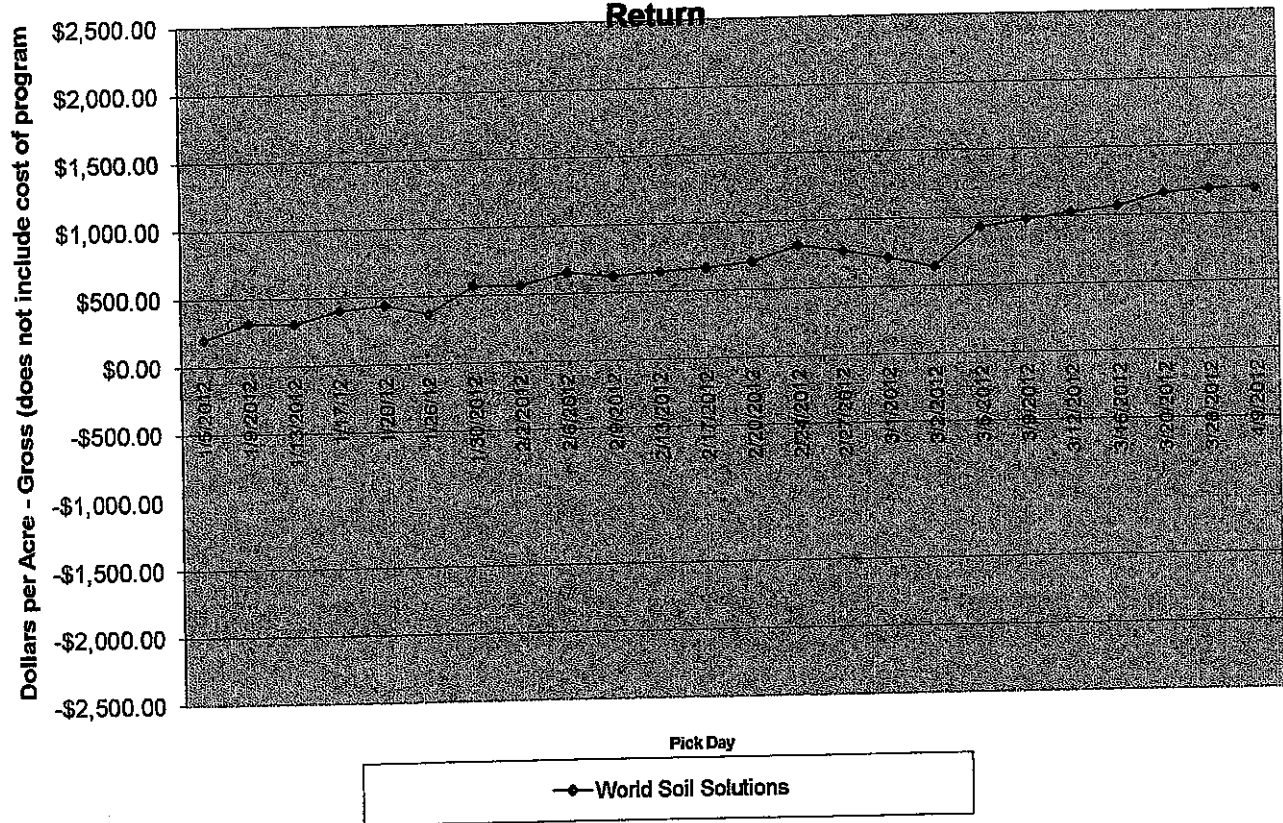
**Chart 10: World Soil Solutions in Strawberries - Ventura County, Fall/Winter 2011-2012 - Mean Weight per Marketable Fruit**



Means followed by the same letter do not significantly differ (P=.10,NDMRT)

Holden Research and Consulting - David Holden

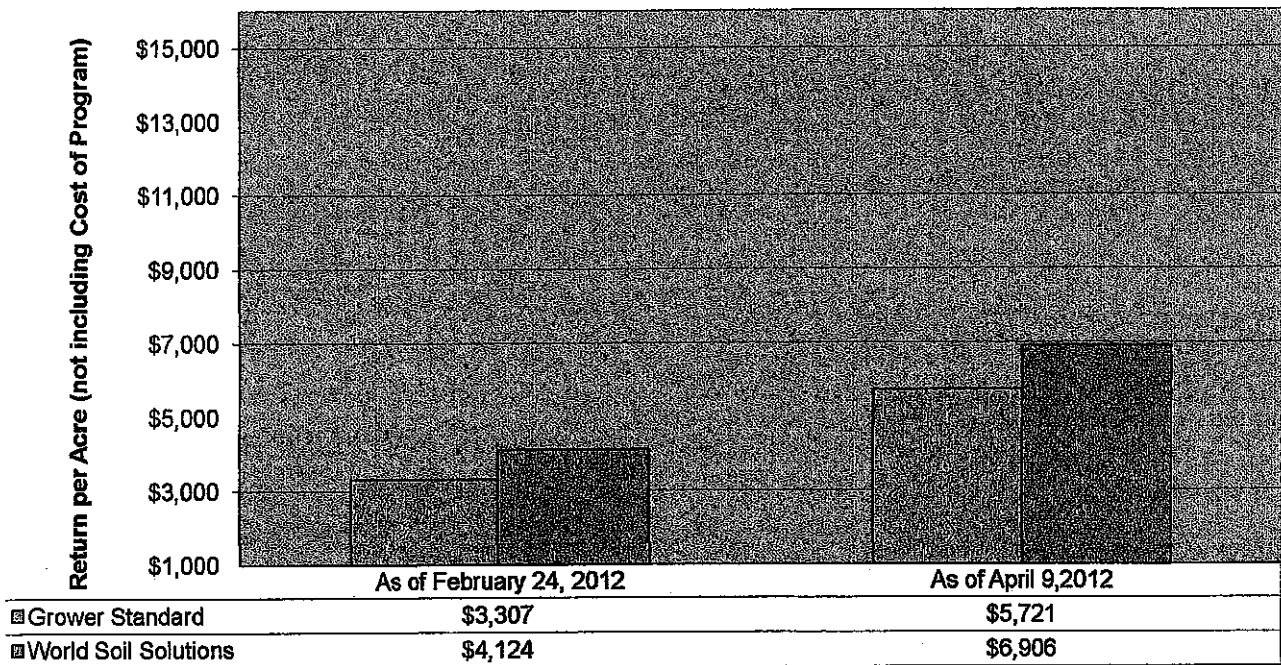
**Chart 11: World Soil Solutions in Strawberries - Ventura County,  
Fall/Winter 2011-2012 - Cumulative Differential from Grower Standard  
Return**



Means followed by the same letter do not significantly differ (P=.10,NDMRT)

Holden Research and Consulting - David Holden

**Chart 12: World Soil Solutions in Strawberries - Ventura County, Fall/Winter 2011-2012 - Net Return per Acre after Picking Costs (Labor, transport and Boxes) - Based on USDA Shipping Point Prices for Each Week**



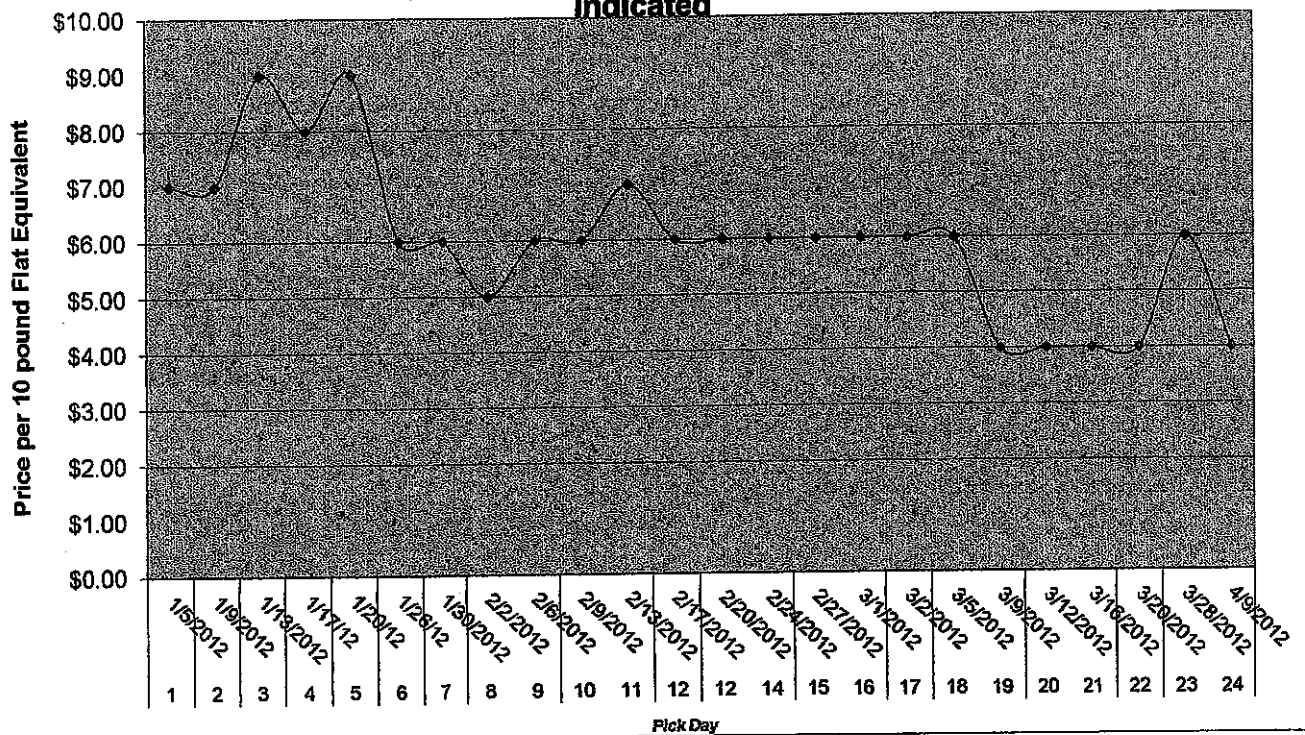
DIFFERENCE IS \$1,185.

Means followed by the same letter do not significantly differ (P=.10,NDMRT)

Holden Research and Consulting - David Holden



**Chart 13: World Soil Solutions in Strawberries - Ventura County, Fall/Winter 2011-2012 - Net Price per Flat Return to Grower on Date Indicated**



— Net return to grower - Price is net to grower after picking, cooling, and hauling (basically high terminal price plus \$1.00 premium for Driscoll between pints and 1 lb. Clambshells less \$6.00)

Means followed by the same letter do not significantly differ (P=.10,NDMRT)

Holden Research and Consulting - David Holden

# A & L WESTERN AGRICULTURAL LABORATORIES

1311 WOODLAND AVE # • MODESTO, CALIFORNIA 95351 • (209) 529-4080 • FAX (209) 529-4736



REPORT NUMBER: 11-357-057

SEND TO: HOLDEN RESEARCH & CONSULTING  
P.O. BOX 1437  
CAMARILLO, CA 93011

CLIENT NO: 5508-D

SUBMITTED BY: EMILY SHELTON

GROWER: WSS

DATE OF REPORT: 12/27/11

## PLANT ANALYSIS REPORT

PAGE: 1

SAMPLE ID	REPORT OF ANALYSIS IN PERCENT								REPORT OF ANALYSIS IN PARTS PER MILLION						
	Nitrogen N	Sulfur S	Phosphorus P	Potassium K	Magnesium Mg	Calcium Ca	Sodium Na	Chloride Cl	Iron Fe	Aluminum Al	Manganese Mn	Boron B	Copper Cu	Zinc Zn	Nitrate-Nitrogen NO <sub>3</sub> -N
WSSSW	3.95	0.38	1.22	2.29	0.61	2.11	0.05		123	54	645	74	74	126	
WSSSR	3.79	0.33	1.19	2.20	0.55	1.84	0.03		138	58	534	77	69	131	

Sample #	Date	Lab #	Crop	Stage/Part
WSSSW	/	47189	STRAWBERRIES	
WSSSR	/	47190	STRAWBERRIES	

### DEFINITION OF INTERPRETATION RATINGS

When interpretation of plant analysis results are given, they will be listed as follows:

- D or Deficient** Plants should be showing visible symptoms of a nutritional deficiency. Plant growth would definitely be curtailed by an insufficient amount of this element.
- L or Low** Plants may be normal in appearance but probably will be responsive to fertilization with this element.
- S or Sufficient** Plants contain adequate amounts of this element for maximum yield and are normal in appearance.
- H or High** Optimum yields can be expected and plants are normal in appearance. However, concentration of this element is higher than normally expected.
- E or Excessive** Plants probably show symptoms of a nutritional disorder or stunted growth. Yields may be reduced significantly by an excessive amount of this element.

This report applies only to the sample(s) tested. Samples are retained a maximum of thirty days after testing.

*MB*

Mike Buttress, CPAg  
A & L WESTERN LABORATORIES, INC.



# Holden Research and Consulting

The use of a World Soil Solutions Program in addition to a grower standard program for the production of Strawberries

Trial ID: 11strawwss01  
Location: Camarillo, CA

Protocol ID: 11strawwss01  
Study Director: Wells Hampton  
Investigator: David Holden

	D Disease FRASS BSTR Strawberry Bennicia	D Disease FRASS BSTR Strawberry Bennicia	D Disease FRASS BSTR Strawberry Bennicia	FRASS BSTR Strawberry Bennicia	FRASS BSTR Strawberry Bennicia	FRASS BSTR Strawberry Bennicia	
Pest Type							
Crop Code							
BBCH Scale							
Crop Name	Strawberry Bennicia	Strawberry Bennicia	Strawberry Bennicia	Strawberry Bennicia	Strawberry Bennicia	Strawberry Bennicia	
Crop Variety							
Description	PLAEME C	PLAEME C	PLATOT C	PLATOT C	ROOT C	SHOOT C	
Part Rated	11/17/11		11/17/11	11/17/11	11/17/11	11/17/11	
Rating Date				WEIFRE	WEIFRE	WEIFRE	
Rating Data Type	COUPLA	COUPLA	VIGOR	G	G	G	
Rating Unit	%	%	0-5				
Sample Size	100	100	10	1	1	1	
Sample Size Unit	PLANT	PLANT	PLANT	Plant	Plant	Plant	
Collection Basis							
Collection Basis Unit							
Number of Subsamples			10	1	1	1	
Crop Stage							
Crop Stage Scale							
Crop Density, Unit							
Footnote Number	1	1	1	1	1	1	
Assessed By	Shelton	Shelton	Shelton	Shelton	Shelton	Shelton	
Days After First/Last Applic.	22 22		22 22	22 22	22 22	22 22	
Tri-Eval Interval	22 DA-A	11 DA-A	22 DA-A	22 DA-A	22 DA-A	22 DA-A	
Plant-Eval Interval	45 DP-1		45 DP-1	45 DP-1	45 DP-1	45 DP-1	
ARM Action Codes		T1				T2	
Number of Decimals		0		1	1	1	
Tri Treatment No. Name	1	2	3	4	5	6	
Other Rate							
Other Rate Unit							
Appl Code							
Appl Description							
Plot							
1 Grower Standard	101	99.0	99	3.0	15.6	5.2	10.4
	201	99.0	99	2.8	17.5	6.8	10.7
	301	99.0	99	2.7	21.3	7.4	13.9
	401	98.0	98	3.3	14.2	5.3	8.9
	501			3.0			
	601			2.7			
Mean =		98.8	99	2.9	17.2	6.2	11.0
2 Grower Standard	102	99.0	99	3.3	23.8	8.8	15.0
WSS1012	202	100.0	100	3.5	18.4	8.2	10.2
WSS1012	302	99.0	99	3.7	24.7	9.0	15.7
	402	100.0	100	3.5	15.6	5.3	10.3
	502			3.3			
	602			3.0			
Mean =		99.5	100	3.4	20.6	7.8	12.8

### Holden Research and Consulting

Pest Type	FRASS BSTR Strawberry Bennicia	FRASS BSTR Strawberry Bennicia	FRASS BSTR Strawberry Bennicia	FRASS BSTR Strawberry Bennicia	FRASS BSTR Strawberry Bennicia	FRASS BSTR Strawberry Bennicia						
Crop Code	FLOWER C	CONIDI C	PLATOT C	ROOT C	SHOOT C	FLOWER C						
BBCH Scale	12/2/11	12/2/11	12/2/11	12/2/11	12/2/11	12/8/11						
Crop Name	COPLPA	CONDC	WEIFRE	WEIFRE	WEIFRE	COPLPA						
Crop Variety	NUMBER	NUMBER	G	G	G	NUMBER						
Description	10	4	1	1	1	10						
Part Rated	Plant	LEAF	Plant	Plant	Plant	Plant						
Rating Date	1	1				1						
Rating Data Type	PLANT	PLANT				PLANT						
Rating Unit	1	1				1						
Sample Size	1	1				1						
Sample Size Unit												
Collection Basis			1	1	1							
Collection Basis Unit												
Number of Subsamples												
Crop Stage												
Crop Stage Scale												
Crop Density, Unit			1	1	1							
Footnote Number			Shelton	Shelton	Shelton							
Assessed By			37 4	37 4	37 4	43 10						
Days After First/Last Applic.			37 DA-A	37 DA-A	37 DA-A							
Trt-Eval Interval	60 DP-1	60 DP-1	60 DP-1	60 DP-1	60 DP-1	66 DP-1						
Plant-Eval Interval					T3							
ARM Action Codes												
Number of Decimals			1	1	1							
Trt Treatment	Other Rate	Other Rate	Appl Unit	Appl Code	Appl Description	Plot	7	8	9	10	11	12
1 Grower Standard	100 percent				Grower Standard starter	101	0.00	53.20	28.6	5.6	23.0	0.10
						201	0.00	50.80	15.4	2.8	12.6	0.00
						301	0.10	48.20	22.8	3.4	19.4	0.00
						401	0.20	46.70	21.3	4.2	17.1	0.20
						501	0.00	51.80	25.7	8.8	16.9	0.10
						601	0.10	49.20	14.2	4.7	9.5	0.30
					Mean =		0.07	49.98	21.3	4.9	16.4	0.12
2 Grower Standard	100 percent				Grower Standard starter	102	0.20	56.80	31.2	5.7	25.5	0.60
WSS1012	2 qt/a	A			Close to planting	202	0.30	48.70	25.4	5.6	19.8	0.40
WSS1012	2 qt/a	BCD			every 3 weeks 3x	302	0.50	55.60	28.7	6.4	22.3	0.80
						402	0.40	51.80	29.6	5.5	24.1	1.10
						502	0.20	53.00	37.4	7.8	29.6	0.50
						602	0.30	54.50	31.3	6.2	25.1	0.30
					Mean =		0.32	53.40	30.6	6.2	24.4	0.62





# Holden Research and Consulting

	FRASS BSTR Strawberry Total for D>	D Disease FRASS BSTR Strawberry Bennicia	D Disease FRASS BSTR Strawberry Bennicia	FRASS BSTR Strawberry	FRASS BSTR Strawberry	D Disease FRASS BSTR Strawberry Bennicia 4 day post >					
	FRUIT C 12/29/11 COPLPA NUMBER 10 Plant 1 PLANT 1	PLATOT C 2/10/12 VIGOR 0-5 6 PLANT 6	PLATOT C 2/10/12 CROWN NUMBER 6 PLANT 6	FRUIT C 2/17/12 SUGCON NUMBER 2 Plant 1 PLANT 1	FRUIT C 4/2/12 SUGCON NUMBER 2 Plant 1 PLANT 1	FRUROT C 2/20/12 Dessication % 6 PLANT 1					
	Shelton 64 14 14 DA-C 87 DP-1 T4	Shelton 107 14 22 DA-A 130 DP-1	Shelton 107 14 22 DA-A 130 DP-1	Shelton 114 41 14 DA-C 137 DP-1	Shelton 159 86 14 DA-C 182 DP-1	Shelton 117 44 22 DA-A 140 DP-1					
						0					
Trt Treatment No. Name	Other Rate	Other Rate	Appl Code	Appl Code	Plot	25	26	27	28	29	30
1 Grower Standard	100 percent		Grower Standard	starter	101	3.10	5.0	6.2	9.20	9.80	38
					201	2.50	5.0	6.0	10.40	10.20	31
					301	3.20	5.0	5.8	10.80	10.00	31
					401	2.40	5.0	6.8	9.80	9.60	31
					501	2.60	5.0	6.7	10.00	10.80	19
					601	2.70	5.0	5.5	9.40	10.40	19
					Mean =	2.75	5.0	6.2	9.93	10.13	28
2 Grower Standard	100 percent		Grower Standard	starter	102	3.20	5.0	6.5	10.80	10.60	6
WSS1012	2 qt/a	A	Close to planting		202	3.10	5.0	6.7	10.80	11.40	31
WSS1012	2 qt/a	BCD	every 3 weeks	3x	302	2.60	5.0	6.8	11.00	10.60	31
					402	3.00	5.0	6.2	10.20	11.80	50
					502	2.90	5.0	4.8	10.20	10.80	6
					602	3.20	5.0	5.0	9.80	11.20	19
					Mean =	3.00	5.0	6.0	10.47	11.07	24

# Holden Research and Consulting

		D Disease FRASS BSTR Strawberry Bennicia 4 day post > FRUIT C 2/20/12 Botrytis Mo %6 PLANT	D Disease FRASS BSTR Strawberry Bennicia 4 day post > PLATOT C 2/20/12 Mucor Mold %6 PLANT	D Disease FRASS BSTR Strawberry Bennicia Total 2/20/12 All %6 PLANT	D Disease FRASS BSTR Strawberry Bennicia 7 day post > FRUROT C 2/23/12 Dessication %6 PLANT	D Disease FRASS BSTR Strawberry Bennicia 7 day post > FRUIT C 2/23/12 Botrytis Mo %6 PLANT					
Pest Type											
Crop Code											
BBCH Scale											
Crop Name											
Crop Variety											
Description											
Part Rated											
Rating Date											
Rating Data Type											
Rating Unit											
Sample Size											
Sample Size Unit											
Collection Basis											
Collection Basis Unit											
Number of Subsamples		1	1	1	1	1					
Crop Stage											
Crop Stage Scale											
Crop Density, Unit		2	2	2	2	2					
Footnote Number		Shelton	Shelton	Shelton	Shelton	Shelton					
Assessed By		117 44	117 44	117 44	120 47	120 47					
Days After First/Last Applic.		22 DA-A	22 DA-A	22 DA-A	40 DA-D	40 DA-D					
Trt-Eval Interval		140 DP-1	140 DP-1	140 DP-1	143 DP-1	143 DP-1					
Plant-Eval Interval				T18							
ARM Action Codes		0	0	0	0	0					
Number of Decimals											
Trt No.	Treatment Name	Other Rate	Other Rate Unit	Appl Code	Appl Description	Plot	31	32	33	34	35
1	Grower Standard	100 percent			Grower Standard starter	101	0	0	38	63	0
						201	0	0	31	63	0
						301	0	0	31	56	0
						401	0	0	31	69	0
						501	0	0	19	56	0
						601	0	0	19	44	0
					Mean =		0	0	28	58	0
2	Grower Standard	100 percent			Grower Standard starter	102	0	6	13	50	0
	WSS1012	2 qt/a	A		Close to planting	202	0	0	31	63	0
	WSS1012	2 qt/a	BCD		every 3 weeks 3x	302	0	0	31	38	0
						402	0	0	50	31	0
						502	0	0	6	75	0
						602	0	0	19	75	0
					Mean =		0	1	25	55	0

# Holden Research and Consulting

	D Disease FRASS BSTR Strawberry Bennicia 7 day post > PLATOT C 2/23/12 Mucor Mold % 6 PLANT	D Disease FRASS BSTR Strawberry Bennicia Total PLATOT C 2/23/12 All % 6 PLANT	D Disease FRASS BSTR Strawberry Bennicia Cumulative PLATOT C 2/23/12 All % 6 PLANT	D Disease FRASS BSTR Strawberry Bennicia 4 day post > FRUROT C 4/10/12 Dessication % 6 PLANT	D Disease FRASS BSTR Strawberry Bennicia 4 day post > FRUIT C 4/10/12 Botrytis Mo % 6 PLANT
Pest Type					
Crop Code					
BBCH Scale					
Crop Name					
Crop Variety					
Description					
Part Rated					
Rating Date					
Rating Data Type					
Rating Unit					
Sample Size					
Sample Size Unit					
Collection Basis					
Collection Basis Unit					
Number of Subsamples	1	1	1	1	1
Crop Stage					
Crop Stage Scale					
Crop Density, Unit					
Footnote Number	2	2	2	2	2
Assessed By	Shelton	Shelton	Shelton	Shelton	Shelton
Days After First/Last Applic.	120 47	120 47	120 47	167 94	167 94
Trt-Eval Interval	40 DA-D	40 DA-D	40 DA-D	22 DA-A	22 DA-A
Plant-Eval Interval	143 DP-1	143 DP-1	143 DP-1	190 DP-1	190 DP-1
ARM Action Codes		T19	T20		
Number of Decimals	0	0	0	0	0
Trt No.					
Treatment Name					
Other Rate					
Other Rate Unit					
Appl Code					
Appl Description					
Plot					
	36	37	38	39	40
1 Grower Standard					
100 percent					
Grower Standard starter					
101	0	63	100	56	0
201	0	63	94	44	6
301	0	56	88	25	0
401	0	69	100	50	0
501	0	56	75	50	0
601	0	44	63	38	0
Mean =	0	58	86	44	1
2 Grower Standard					
100 percent					
Grower Standard starter					
102	0	50	63	50	0
WSS1012					
2 qt/a					
A					
Close to planting					
202	0	63	94	38	0
WSS1012					
2 qt/a					
BCD					
every 3 weeks 3x					
302	0	38	69	50	6
402	0	31	81	50	0
502	0	75	81	50	6
602	0	75	94	19	0
Mean =	0	55	80	43	2

### Holden Research and Consulting

Pest Type	D Disease FRASS BSTR	D Disease FRASS BSTR	D Disease FRASS BSTR	D Disease FRASS BSTR	D Disease FRASS BSTR
Crop Code	Strawberry Bennicia	Strawberry Bennicia	Strawberry Bennicia	Strawberry Bennicia	Strawberry Bennicia
BBCH Scale	4 day post >	Total	7 day post >	7 day post >	7 day post >
Crop Name	PLATOT C	PLATOT C	FRUROT C	FRUIT C	PLATOT C
Crop Variety	4/10/12	4/10/12	4/13/12	4/13/12	4/13/12
Description	Mucor Mold	All	Dessication	Botrytis Mo	Mucor Mold
Part Rated	%	%	%	%	%
Rating Date	6	6	6	6	6
Rating Data Type	PLANT	PLANT	PLANT	PLANT	PLANT
Rating Unit					
Sample Size					
Sample Size Unit					
Collection Basis					
Collection Basis Unit					
Number of Subsamples	1	1	1	1	1
Crop Stage					
Crop Stage Scale					
Crop Density, Unit					
Footnote Number	2	2	2	2	2
Assessed By	Shelton	Shelton	Shelton	Shelton	Shelton
Days After First/Last Applic.	167 94	167 94	170 97	170 97	170 97
Tri-Eval Interval	22 DA-A	22 DA-A	40 DA-D	40 DA-D	40 DA-D
Plant-Eval Interval	190 DP-1	190 DP-1	193 DP-1	193 DP-1	193 DP-1
ARM Action Codes		T25			
Number of Decimals	0	0	0	0	0
Tri Treatment No. Name	41	42	43	44	45
Other Rate					
Other Rate Unit					
Appl Code					
Appl Description					
Plot					
1 Grower Standard	0	56	44	0	0
100 percent	0	50	50	0	0
Grower Standard starter	0	25	75	0	0
101	0	50	50	0	0
201	0	50	50	0	0
301	0	38	56	0	0
401	0			0	0
501	0			0	0
601	0			0	0
Mean =	0	45	54	0	0
2 Grower Standard	0	50	50	0	0
100 percent	0	38	50	0	0
WSS1012	0	56	44	0	0
2 qt/a	0	50	50	0	0
A	0	56	44	0	0
Grower Standard starter	0	19	81	0	0
Close to planting	0			0	0
BCD every 3 weeks 3x	0			0	0
102	0			0	0
202	0			0	0
302	0			0	0
402	0			0	0
502	0			0	0
602	0			0	0
Mean =	0	45	53	0	0



### Holden Research and Consulting

Pest Type	D Disease	D Disease	FRASS	FRASS	FRASS						
Crop Code	FRASS	FRASS	BSTR	BSTR	BSTR						
BBCH Scale	BSTR	BSTR	Strawberry	Strawberry	Strawberry						
Crop Name	Strawberry	Strawberry	Benecias	Benecias	Benecias						
Crop Variety	Bennicia	Bennicia									
Description	Total	Cumulative									
Part Rated	PLATOT C	PLATOT C	FRUMAR C	FRUMAR C	FRUMAR C						
Rating Date	4/13/12	4/13/12	1/5/12								
Rating Data Type	All	All	Shelton	Shelton	Shelton						
Rating Unit	%	%	G	NUMBER	g/fruit						
Sample Size	6	6	10	10	10						
Sample Size Unit	PLANT	PLANT	PLANT	PLANT	PLANT						
Collection Basis			PLANT	PLANT	PLANT						
Collection Basis Unit			6	6	6						
Number of Subsamples	1	1	87	87	87						
Crop Stage			BBCH	BBCH	BBCH						
Crop Stage Scale			1.33FT2								
Crop Density, Unit			1	1	1						
Footnote Number	2	2	Shelton	Shelton	Shelton						
Assessed By	Shelton	Shelton	71 21								
Days After First/Last Applic.	170 97	170 97	21 DA-C								
Trt-Eval Interval	40 DA-D	40 DA-D	94 DP-1	73 DP-1	73 DP-1						
Plant-Eval Interval	193 DP-1	193 DP-1			T6						
ARM Action Codes	T26	T27			2						
Number of Decimals	0	0	1	1							
Trt No.	Treatment Name	Other Rate	Other Rate Unit	Appl Code	Appl Description	Plot	46	47	48	49	50
1	Grower Standard	100 percent			Grower Standard starter	101	44	100	3.3	0.2	3.33
						201	50	100	81.7	2.2	33.33
						301	75	100	50.0	1.5	29.72
						401	50	100	48.3	1.2	28.89
						501	50	100	35.8	1.0	24.17
						601	56	94	78.3	2.5	31.67
					Mean =		54	99	49.6	1.4	25.19
2	Grower Standard	100 percent			Grower Standard starter	102	50	100	49.2	1.0	40.83
	WSS1012	2 qt/a	A		Close to planting	202	50	88	109.2	3.2	28.37
	WSS1012	2 qt/a	BCD		every 3 weeks 3x	302	44	100	48.3	1.7	25.83
						402	50	100	67.5	2.0	35.69
						502	44	100	41.7	1.0	27.92
						602	81	100	59.2	1.7	22.99
					Mean =		53	98	62.5	1.8	30.27

### Holden Research and Consulting

	FRASS BSTR Strawberry Benecias	FRASS BSTR Strawberry Benecias	FRASS BSTR Strawberry Benecias	FRASS BSTR Benecias Total Weight	FRASS BSTR Benecias
Pest Type	FRUUNM C	FRUUNM C	FRUUNM C	FRUMAR C	FRUMAR C
Crop Code	Shelton	Shelton	Shelton	Shelton	Shelton
BBCH Scale	G	NUMBER	g/fruit	G	percent
Crop Name	10	10	10	10	10
Crop Variety	PLANT	PLANT	PLANT	PLANT	PLANT
Description	PLANT	PLANT	PLANT	PLANT	PLANT
Part Rated	6	6	6	6	6
Rating Date	87	87	87	87	87
Rating Data Type	BBCH	BBCH	BBCH	BBCH	BBCH
Rating Unit	1	1	1	1	1
Sample Size	Shelton	Shelton	Shelton	Shelton	Shelton
Sample Size Unit					
Collection Basis					
Collection Basis Unit					
Number of Subsamples					
Crop Stage					
Crop Stage Scale					
Crop Density, Unit					
Footnote Number					
Assessed By					
Days After First/Last Applic.					
Trt-Eval Interval	73 DP-1	73 DP-1	73 DP-1	73 DP-1	73 DP-1
Plant-Eval Interval			T7	T8	T9
ARM Action Codes	1	1	2	2	3
Number of Decimals					
Trt Treatment	51	52	53	54	55
No. Name					
1 Grower Standard	0.0	0.0	0.00	3.33	16.667
100 percent	4.2	0.2	4.17	85.83	83.333
Grower Standard starter	9.2	0.3	9.17	59.17	72.304
201	10.0	0.7	7.50	58.33	64.493
301	2.5	0.2	2.50	38.33	61.111
401	32.5	1.0	21.25	110.83	72.115
501					
601					
Mean =	9.7	0.4	7.43	59.31	61.671
2 Grower Standard	0.0	0.0	0.00	49.17	83.333
100 percent	0.0	0.0	0.00	109.17	83.333
Grower Standard starter	0.0	0.0	0.00	48.33	83.333
WSS1012	0.0	0.0	0.00	67.50	100.000
2 qt/a A Close to planting	0.0	0.0	0.00	50.00	56.250
302	8.3	0.2	8.33	100.83	50.180
WSS1012	41.7	1.3	20.69		
2 qt/a BCD every 3 weeks 3x					
402					
502					
602					
Mean =	8.3	0.3	4.84	70.83	76.072

### Holden Research and Consulting

Pest Type	FRASS BSTR	FRASS BSTR	FRASS BSTR	FRASS BSTR	FRASS BSTR
Crop Code	Strawberry	Strawberry	Strawberry	Strawberry	Strawberry
BBCH Scale	Benecias	Benecias	Benecias	Benecias	Benecias
Crop Name	FRUMAR C	FRUMAR C	FRUMAR C	FRUUNM C	FRUUNM C
Crop Variety	1/30/12	Shelton	Shelton	Shelton	Shelton
Description	G	NUMBER	g/fruit	G	NUMBER
Part Rated	10	10	10	10	10
Rating Date	PLANT	PLANT	PLANT	PLANT	PLANT
Rating Data Type	PLANT	PLANT	PLANT	PLANT	PLANT
Rating Unit	6	6	6	6	6
Sample Size	87	87	87	87	87
Sample Size Unit	BBCH	BBCH	BBCH	BBCH	BBCH
Collection Basis	1.33FT2				
Collection Basis Unit	1	1	1	1	1
Number of Subsamples	Shelton	Shelton	Shelton	Shelton	Shelton
Crop Stage	96 23				
Crop Stage Scale	21 DA-C	73 DP-1	73 DP-1	73 DP-1	73 DP-1
Crop Density, Unit	119 DP-1		T10		
Footnote Number	1	1	2	1	1
Assessed By					
Days After First/Last Applic.					
Trt-Eval Interval					
Plant-Eval Interval					
ARM Action Codes					
Number of Decimals					
Trt Treatment	Other	Other	Appl	Appl	Plot
No. Name	Rate	Rate	Unit	Code	Description
1	Grower Standard	100 percent			Grower Standard starter
					101
					201
					301
					401
					501
					601
					Mean =
					56
					57
					58
					59
					60
					83.3
					2.3
					28.39
					16.7
					0.5
					27.5
					0.8
					22.08
					0.0
					108.3
					3.0
					34.57
					0.0
					41.7
					1.3
					27.50
					0.0
					45.8
					1.7
					17.78
					0.0
					54.2
					1.3
					35.28
					0.0
					0.0
					60.1
					1.8
					27.60
					2.8
					0.1
2	Grower Standard	100 percent			Grower Standard starter
	WSS1012	2 qt/a	A		Close to planting
	WSS1012	2 qt/a	BCD		every 3 weeks 3x
					102
					202
					302
					402
					502
					602
					Mean =
					102
					202
					302
					402
					502
					602
					Mean =
					137.5
					3.5
					39.07
					5.0
					0.2
					26.7
					0.8
					22.50
					0.0
					131.7
					3.3
					32.92
					0.0
					32.5
					1.0
					21.25
					0.0
					51.7
					1.3
					25.56
					0.0
					60.0
					1.3
					40.83
					0.0
					0.0
					73.3
					1.9
					30.35
					0.8
					0.0

### Holden Research and Consulting

Pest Type Crop Code BBCH Scale Crop Name Crop Variety Description Part Rated Rating Date Rating Data Type Rating Unit Sample Size Sample Size Unit Collection Basis Collection Basis Unit Number of Subsamples Crop Stage Crop Stage Scale Crop Density, Unit Footnote Number Assessed By Days After First/Last Applic. Trt-Eval Interval Plant-Eval Interval ARM Action Codes Number of Decimals	FRASS BSTR Strawberry Benecias	FRASS BSTR Benecias	FRASS BSTR Benecias	FRASS BSTR Strawberry Benecias	FRASS BSTR Strawberry Benecias						
	FRUMAR C	Total Weight FRUMAR C	FRUMAR C	FRUMAR C	FRUMAR C						
	Shelton g/fruit 10 PLANT	Shelton G 10 PLANT	Shelton percent 10 PLANT	2/20/12 Shelton G 10 PLANT	Shelton NUMBER 10 PLANT						
	PLANT 6 87 BBCH 1 Shelton	PLANT 6 87 BBCH 1 Shelton	PLANT 6 87 BBCH 1 Shelton	PLANT 6 87 BBCH 1 Shelton	PLANT 6 87 BBCH 1 Shelton						
	73 DP-1 T11 2	73 DP-1 T12 2	73 DP-1 T13 3	21 DA-C 140 DP-1 1	73 DP-1 1						
Trt Treatment No. Name	Other Rate	Other Rate	Appl Unit	Appl Code	Appl Description	Plot	61	62	63	64	65
1 Grower Standard	100 percent		Grower Standard	starter		101	12.50	100.00	75.000	46.7	1.5
						201	0.00	27.50	66.667	105.0	2.7
						301	0.00	108.33	100.000	134.2	4.2
						401	0.00	41.67	83.333	71.7	2.3
						501	0.00	45.83	66.667	19.2	0.5
						601	0.00	54.17	83.333	155.8	4.3
					Mean =		2.08	62.92	79.167	88.8	2.6
2 Grower Standard	100 percent		Grower Standard	starter		102	5.00	142.50	96.000	56.7	1.7
WSS1012	2 qt/a	A	Close to planting			202	0.00	26.67	66.667	135.0	3.7
WSS1012	2 qt/a	BCD	every 3 weeks	3x		302	0.00	131.67	83.333	121.7	3.3
						402	0.00	32.50	66.667	56.7	1.3
						502	0.00	51.67	66.667	0.0	0.0
						602	0.00	60.00	83.333	232.5	6.0
					Mean =		0.83	74.17	77.111	100.4	2.7

## Holden Research and Consulting

The use of a World Soil Solutions Program in addition to a grower standard program for the production of Strawberries

Protocol ID: 11strawwss01  
Location: Camarillo, CA

Study Director: Wells Hampton  
Investigator: David Holden

**Project Number:** 11strawwss01      **Trial Establishment Guidelines**  
**Developer:** Holden      **Issue Date:** 8/19/11

<b>Number of Trials</b>
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1
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**Total Trials:** 1

**Objectives:**

To compare the growth and production effects from the use of a standard grower program to one enhanced with World Soil Solutions based products.

**Target Crop Description**

**Crop 1:** FRASS *Fragaria* sp.      Strawberry  
**Variety:** tbd  
**BBCH Scale:**      BSTR

**Application Directions:**

All fertilizer to be applied pre-plant in the bed either broadcast prior to bed-up or hand chiseled under the transplant line. World Soil Solutions program to be run in addition to the grower standard program every three weeks for four applications starting at transplant.

**Geographic Area/Environmental Considerations:**

Ventura county strawberry growing region

**Cropping Considerations:**

Commercially grown strawberry

**Data to Collect:**

1. Plant and root sizing over time. (2-3 sample dates)
2. Pre-plant soil samples and end of season soil samples, along with two in season leaf samples for each treatment area. Run chloride also.
3. Production data collected through randomized sub-samples of replicated plots, with emphasis on total production. Replicated 4-6 times.
4. Brix on fruit several times during season
5. Do a couple of storage studies in season
6. Use Penetrometer on soil in season to check on compaction after use of WSS1012

**Statistical Analysis:**

ANOVA, LSD, or DMRT at 90%

**Summarize and Submit Study By (Date):** 8/31/12

## Holden Research and Consulting

**The use of a World Soil Solutions Program in addition to a grower standard program for the production of Strawberries**

Protocol ID: 11strawwss01  
Location: Camarillo, CA

Study Director: Wells Hampton  
Investigator: David Holden

Trt No.	Treatment Name	Rate Unit	Other Rate	Other Rate Unit	Appl Code	Appl Description
1	Grower Standard		100	percent		Grower Standard starter
2	Grower Standard WSS1012 WSS1012		100 2 2	percent qt/a qt/a	A BCD	Grower Standard starter Close to planting every 3 weeks 3x

### Additional Treatment Information

#### Other Rate Unit

qt/a = Quarts Product per Acre

Replications: 6, Untreated treatments: 1, Design: Completely Random, Treatment units: Treated plot size, Dry Form. Unit: %, Treated plot size Width: 2.5 feet, Treated plot size Length: 330 feet, Application volume: 200 l/ha, Mix size: 2 liters, Format definitions: G-A117.DEF, G-A117.FRM

Product quantities required for listed treatments and applications in one trial:

Amount*	Unit	Treatment Name	Form Conc	Form Type	Lot Code
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- \* 'Per area' calculations based on spray volume= 200 l/ha, mix size= 2 liters (mix size basis).
- \* Product amount calculations increased 25 % for overage adjustment.
- \* Adjusted for multiple applications in treatment list.