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Colorado State University

Agricultural Experiment Station

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Arkansas Valley Research Center 2010 Reports

COLORADO STATE UNIVERSITY

Agricultural Experiment Station

Arkansas Valley Research Center – 2010 Reports

Michael Bartolo, Jeff Davidson, Kevin Tanabe and Lane Simmons,

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Acknowledgements:

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Cover: USDA-ARS Soil Scientist and longtime investigator at the AVRC, Dr. Ardell Halvorson.

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TABLE OF CONTENTS

FIELD CROPS

VEGETABLE CROPS

Alfalfa Variety Performance Test at Rocky Ford—2010

Jeffery W. Davidson, Kevin Tanabe, Michael E. Bartolo, and Abdel Berrada

Summary

The 2010 results of Colorado State University's alfalfa variety test at Rocky Ford are presented in Table 1 below. This is the third and final year of a three-year testing period. The plots were furrow irrigated and efforts were taken to maintain a pest-free environment.

Table 1. Forage yields of 15 alfalfa varieties at the Arkansas Valley Research Center in Rocky Ford in 2010.[1]

Variety	Source	1st Cutting 04-Jun-10	2nd Cutting 14-Jul-10	3rd Cutting 25-Aug-10	4th Cutting 14-Oct-10	Total 2010	3-yr Total[2]
		----------	----------	tons/acre[3]	----------	----------	----------
Medalist	Intermountain Farmers Assoc.	3.24	2.93	2.01	1.50	9.67	26.00
Masterpiece	JR Simplot Co.	3.11	2.89	2.02	1.55	9.56	25.74
Magnum VI	Dairyland Seed Co., Inc.	2.76	2.69	1.97	1.47	8.89	25.34
LegenDairy 5.0	Croplan Genetics	3.03	2.75	1.91	1.47	9.17	25.26
WL 363HQ	W-L Research	2.95	2.75	1.95	1.45	9.11	25.21
Integra 8400	Wilbur-Ellis Co.	3.03	2.77	1.91	1.51	9.22	25.07
5454	Pioneer	2.88	2.60	1.87	1.38	8.71	24.52
Lariat	JR Simplot Co.	2.84	2.58	1.95	1.40	8.78	24.29
CW 500	Producer's Choice	2.72	2.66	1.89	1.48	8.75	24.25
PGI 424	Producer's Choice	2.81	2.66	1.88	1.48	8.82	24.12
Oneida	Cornell University	2.80	2.55	1.71	1.32	8.38	24.12
FSG 5285F	Allied Seed	2.36	2.36	1.85	1.43	7.99	24.06
Ameristand 407TQ	America's Alfalfa	2.60	2.42	1.88	1.38	8.27	23.73
WL 343HQ	W-L Research	2.86	2.58	1.86	1.37	8.67	23.45
Vernal	USDA-WI AES	2.42	2.46	1.68	1.11	7.67	23.42
Average		2.83	2.64	1.89	1.42	8.78	24.57
CV (%)		9.0	7.7	6.5	5.7	5.5	
LSD (0.05)		0.36	0.29	0.18	0.11	0.68	

[1]Seeded August 10, 2007 at 22 lbs. per acre.
[2]Table is arranged by decreasing 3-yr. total yield.
[3]Yields were calculated on an air-dry basis.

Site Information: Elevation: 4178 ft.
Soil: Rocky Ford Silty Clay Loam
Precipitation: April 1, 2010 to September 30, 2010 = 10.23 inches
Last Spring Frost: April 9, 2010 (25.6^{o}F)
First Fall Frost: October 26, 2010 (28.6^{o}F)
Fertilizer: 200 lbs./acre of 11-52-0 on March 18, 2010
Herbicide: Thunder 4 oz./acre on April 8, 2010
Insecticide: None applied

Contact Information:

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Irrigated Corn Variety Performance Trial at Rocky Ford

Jeff Davidson, Kevin Tanabe, Jim Hain, and Jerry Johnson

Source	Hybrid[a]	Yield	Moist.	Test Weight	Plant Height	Population
		bu/ac	percent	lb/bu	in	plants/ac
Dekalb	DKC64-83 (GENVT3P)	243.2	17.8	59.1	88	36,300
Garst	83P07 GT/CB/LL	235.2	24.8	51.2	99	30,129
Dekalb	DKC64-69 (GENVT3P)	232.9	18.7	55.7	80	28,677
LG Seeds	LG2642VT3	220.9	22.0	54.1	91	31,581
Triumph Seeds	1420X	217.7	21.3	54.9	90	29,403
Dekalb	DKC62-97 (GENVT3P)	213.6	18.9	56.1	90	31,218
Garst	83E90-3000GT	212.2	22.6	53.5	98	27,951
LG Seeds	LG2555VT3	210.3	17.4	55.8	98	33,759
Mycogen Seeds	2V732	209.8	20.2	55.7	94	29,766
Croplan Genetics	6818VT3	208.5	21.2	55.3	88	28,314
NK Brand Seed	N68B-3000GT	207.8	17.7	55.3	87	32,307
Golden Harvest	H-9084 GT/CB/LL	206.5	18.9	54.5	93	31,581
Mycogen Seeds	X20785	204.5	21.1	54.0	87	27,225
Dekalb	DKC62-63 (GENVT3P)	200.9	20.7	55.7	94	29,766
LG Seeds	LG2616VT3	199.5	16.7	55.5	97	30,855
Golden Harvest	H-9173 3000GT	197.9	21.7	53.1	97	30,492
Triumph Seeds	1326X	196.8	18.6	56.7	84	28,677
Triumph Seeds	7514S	195.1	22.3	53.9	97	29,040
Mycogen Seeds	2T784	190.5	20.2	54.5	92	25,410
LG Seeds	LG2620VT3	187.1	15.7	57.1	99	32,307
NK Brand Seed	N74C-3000GT	185.7	19.7	54.8	97	27,225
Dekalb	DKC63-84 (VT3)	183.8	21.3	54.9	94	33,396
Croplan Genetics	5757VT3	169.5	17.0	58.9	90	27,225
Croplan Genetics	4421VT3	168.2	13.8	56.6	82	34,122
Average		**204.1**	**19.6**	**55.3**	**92**	**30,280**
[b]$LSD_{0.30}$		16.8				
$LSD_{0.05}$		32.3				

[a]Yields corrected to 15.5% moisture
[b]$LSD_{0.30}$ is most useful for producers using these results to select a variety but some collaborators find $LSD_{0.05}$ useful
Experimental Design: randomized complete block design with three replications
Plot size: 5' x 30'

Site Information

Collaborator: Arkansas Valley Research Center
Planting Date: 4/30/2010
Harvest Date: 10/11/2010 and 10/12/10
Note: Some plot variability was due to isolated soil compaction and irrigation issues.

Winter Wheat Variety Trial

Jeff Davidson, Kevin Tanabe, Jerry Johnson, and Scott Haley

Variety	Yield (bu/ac)	Test Weight (lb/bu)	Height (in)	Lodging scale 1-9[a]
Aspen	66.2	58.8	37	1
Keota	64.5	59.2	41	3
CO050175-1	62.6	59.8	42	7
CO050233-2	62.4	57.4	38	1
CO04393	62.2	59.6	41	2
Hitch	62.2	57.8	37	1
CO05W194	62.0	59.5	37	1
Jagalene	61.6	56.1	42	7
Settler CL	61.0	57.4	39	3
CO06052	60.3	59.7	39	1
Armour	59.5	57.2	35	6
Thunder CL	59.4	56.4	40	2
Billings	59.2	59.7	38	5
SY Gold	59.1	57.6	42	3
Bond CL	59.1	57.7	39	1
Duster	58.4	57.3	39	5
Winterhawk	58.1	58.1	40	4
CO050303-2	58.0	59.2	39	2
Stout	57.7	56.3	38	2
Yuma	57.3	57.2	39	3
Fuller	57.3	57.7	37	7
CO06424	57.0	58.2	39	7
Ripper	56.3	56.0	38	6
Smoky Hill	55.1	57.5	39	6
TAM 111	54.5	56.1	42	7
CO050322	53.9	56.2	40	7
CO050337-2	52.0	57.3	41	8
CO05W111	50.7	58.2	41	3

Hatcher	45.1	57.2	39	4
TAM 112	43.5	59.5	37	7
Bill Brown	43.5	56.4	38	7
CO050270	42.9	57.0	37	7
Average	**57.0**	**57.8**	**39.1**	**4.3**
$LSD_{(0.30)}$	3.6			

[a]**Lodging Rating**: 1-no lodging, 9-fully lodged
Site: Arkansas Valley Research Center
Planting Date: 9/17/2010
Harvest Date: 7/15/2010
Note: Yields were much lower than expected for irrigated winter wheat. There was powdery mildew pressure throughout the plots. Also, plots were damaged by hail during grain fill.

2010 Irrigated Dry Bean Variety Performance Trial at Rocky Ford

Jeff Davidson, Kevin Tanabe, Jim Hain, and Jerry Johnson

Variety	Source	Yield[a]	Moisture	Test Weight	Seeds/Pound
		lb/ac	percent	lb/bu	count
Durango	ProVita, Inc.	2887	9.0	58.8	1159
Bill Z	Colorado State U	2847	9.1	58.0	1228
Poncho	Colorado State U	2833	9.0	59.7	1169
GTS-903	Gentec Inc.	2772	9.4	58.7	1180
Othello	USDA Prosser, WA	2761	8.9	59.4	1301
Lariat	North Dakota State U	2672	9.5	56.3	1165
Stampede	North Dakota State U	2663	9.1	56.6	1171
Medicine Hat	Seminis	2618	8.8	59.1	1329
Windbreaker	Seminis	2569	8.8	56.2	1181
06185	ProVita, Inc.	2561	9.0	60.6	1275
P7025615	ADM-Seedwest	2543	9.0	57.6	1215
GTS-904	Gentec Inc.	2534	9.1	57.6	1173
CO 24972	Colorado State U	2505	9.3	56.5	1194
La Paz	ProVita, Inc.	2481	9.1	60.7	1320
Montrose	Colorado State U	2453	9.0	59.6	1329
06187	ProVita, Inc.	2449	8.7	59.6	1221
CO 55646	Colorado State U	2377	10.0	57.9	1274
Croissant	Colorado State U	2376	8.9	59.0	1245
Grand Mesa	Colorado State U	2350	8.9	58.6	1374
COB-2594-03	Gentec Inc.	2317	9.2	59.4	1299
ND-307	North Dakota State U	2313	9.1	55.7	1215
Mariah	Seminis	2246	8.9	58.2	1260
99217	ProVita, Inc.	2129	8.9	59.8	1230
IP08-2	University of Idaho	1463	9.3	56.4	1380
Average		**2488**	**9.1**	**58.3**	**1245**
$LSD_{(0.30)}$		228			

[a]Yields corrected to 14% moisture

Experimental Design: randomized complete block with three replications
Field Plot Size: 10' x 25'

Site Information

Cooperator:	Arkansas Valley Research Center-CSU
Harvest date:	9/16/2010
Planting date:	6/7/2010
Seeding Rate:	85,000 Seeds/Acre
Soil Type:	Rocky Ford Silty Clay Loam
Previous Crop:	Corn
Irrigation:	Furrow

The variety IP08-2 (new release from University of Idaho) was weak and yellowed from emergence through harvest.

Disease pressure was minimal throughout season with some light virus pressure. Insect pressure was light to moderate. Mexican Bean beetle was present from mid-season through harvest and pressure was heavy in some areas of field (25-30% defoliation). Some pod-feeding insect damage from caterpillars (salt marsh, Painted Lady larvae, yellow-striped armyworm). Crop had good moisture early but the hot and dry weather during late July and August may have resulted in water deficits and affected yield. Difficulty combining trial may have reduced yields because beans had to be hand-fed into the combine with pitch forks and some shattering occurred.

2010 Winter Canola Variety Performance Trial

Variety	*Yield*	*Height*
	lbs/ac	in
Safran	2025	43
BSX-7228	1979	41
BSX-7019	1958	42
KS4426	1861	41
Baldur	1813	44
Visby	1723	40
KS4158	1711	40
Kadore	1697	36
CHHE96	1683	40
Hybistar	1678	39
MH06E10	1638	41
Sitro	1625	43
BSX-6271	1623	40
BSX-7341	1623	42
Wichita	1616	40
Kiowa	1604	42
BSX-7127	1583	41
KS3254	1513	40
Virginia	1492	38
KS4475	1479	42
Dynastie	1475	41
Hybrisurf	1428	42
BSX-501	1425	41
Sumner	1419	37
HyClass 154W	1403	43
MH905492	1352	42
Dimension	1337	40
MH06E11	1322	42
MH06E4	1223	41
Flash	1207	42
Average	**1584**	**41**
$LSD_{(0.30)}$	231	

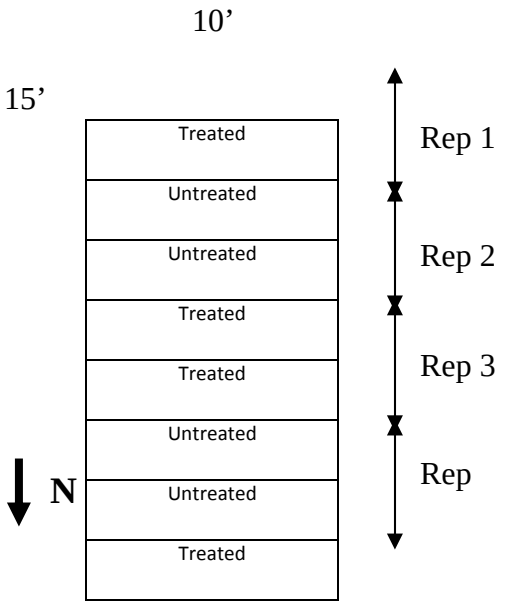
Harvest dates: 6/30/2010 and 7/6/2010
Planting date: 8/26/2009
Cooperator: Arkansas Valley Research Center
Dr. Perry Cabot

Effect of FoliarBlend on Alfalfa Production

Jeff Davidson and Michael Bartolo
Arkansas Valley Research Center
Colorado State University

The field trial was conducted at the Arkansas Valley Research Station in Rocky Ford, Colorado. The alfalfa was established and in the third year of production. The soil type was Rocky Ford Silty Clay Loam. The field was flood irrigated and was monitored for insect and weed pests. The purpose of this trial was to evaluate whether or not FoliarBlend (manufactured by Agri-Gro, Doniphan, Missouri) had any effect on yield or quality of alfalfa.

Plot size was 10 ft. by 15 ft. or 150 ft.^{2}. There were two treatments compared in this trial. The first treatment was a foliar application of the equivalent of 32 oz. per acre of FoliarBlend. The actual amount applied to treated plots was 0.11 oz. of FoliarBlend in 8.8 oz. of water. The treatment was applied with a 2.5 gal. hand-held garden sprayer. The other treatment was a non-treated control. Each treatment was replicated four times throughout the trial area. The trial itself was replicated twice, East and West, within the field. The map of the plot area can be found below.



The first treatment of FoliarBlend was applied 18-Jun-2010 to the East trial after the first cutting of the season. The second treatment date was 22-Jul-2010 after the second cutting. The final treatment for the East trial was applied 03-Sep-2010. The West trial was added after the second cutting because of

some irrigation issues in the East trial. The West trial was treated on 22-Jul-2010 and 03-Sep-2010, after the second and third cuttings, respectively.

Table 1 indicates the yield and plant height results for the East trial. There were a total of three treatments of FoliarBlend applied to the East trial.

Table 1. East trial results.

Treatment/Rep	2nd Cut Yield tons/ac	3rd Cut Yield tons/ac	4th Cut Yield tons/ac	Total Yield tons/ac	Avg. Plant Height (in.)
FoliarBlend/1	1.56	1.53	1.21	4.30	26.4
FoliarBlend/2	2.45	1.93	1.34	5.72	27.2
FoliarBlend/3	2.63	1.80	1.32	5.74	26.6
FoliarBlend/4	2.81	1.79	1.44	6.04	27.8
Untreated/1	1.70	1.64	1.23	4.57	24.4
Untreated/2	2.68	1.73	1.35	5.76	28.8
Untreated/3	2.65	1.82	1.31	5.78	27.6
Untreated/4	2.58	1.83	1.33	5.73	24.2
Average	2.38	1.76	1.32	5.46	26.6
$LSD_{(0.5)}$				0.38	3.93
Treatment Effect	n/s	n/s	n/s	n/s	n/s

Table 2 compares the results of a laboratory analysis indicating the overall quality of the forage produced from the FoliarBlend plots and the untreated control plots for the East trial. The forage quality sample was taken during the 2nd cutting on 14-Jul-2010.

Table 2. Forage quality results.*

	FoliarBlend	Untreated Control
Moisture %	74.8	75.8
Dry Matter %	25.2	24.2
Crude Protein (CP) %	18.5	17.7
% Acid Detergent Fiber (ADF)	38.6	40.0
% Neutral Detergent Fiber (NDF)	48.5	48.2
% Total Digestible Nutrients (TDN)	57.0	56.1
Relative Feed Value (RFV)	113	111

*USDA Quality Guidelines:

Quality	CP	ADF	NDF	RFV
Supreme	>22	<27	<34	>185
Premium	20-22	27-29	34-36	170-185
Good	18-20	29-32	36-40	150-170
Fair	16-18	32-35	40-44	130-15
Utility	<16	>35	>44	<130

Table 3 reveals the yield results for the West trial. The first treatment for the West plots was applied after the second cutting on 22-Jul-2010. There were a total of two treatments of FoliarBlend applied to the West trial.

Table 3. West trial results.

Treatment/Rep	**3rd Cut Yield tons/ac**	**4th Cut Yield tons/ac**	**Total Yield tons/ac**
FoliarBlend/1	1.72	1.35	3.07
FoliarBlend/2	1.80	1.39	3.19
FoliarBlend/3	1.76	1.42	3.18
FoliarBlend/4	1.72	1.25	2.98
Untreated/1	1.81	1.43	3.23
Untreated/2	1.71	1.35	3.06
Untreated/3	1.68	1.36	3.04
Untreated/4	1.73	1.34	3.07
Average	1.74	1.36	3.10
$LSD_{(0.5)}$			0.25
Treatment Effect	n/s	n/s	n/s

The results of these two trials indicate that there were no significant differences between the two treatments represented. Neither the FoliarBlend nor the untreated control had any significant effect on yield, plant height, or forage quality in either the East or the West trial.

Corn Fallow Trial

Jim Valliant, Mike Bartolo, and Kevin Tanabe
Arkansas Valley Research Center
Colorado State University

Water sales in the Arkansas River Valley of Colorado have been on a "buy and dry" basis for many years. Agricultural water rights have been sold to cities on the front range and the previously irrigated land removed from production. These lands revert to dry land production and, in the arid environment of Southeastern Colorado, have limited agricultural productivity. In many instances, these lands have serious erosion and weed problems.

An alternative to water sales is the temporary leasing of agricultural waters to the cities, particularly in times of drought. Water leases give the shareholders a new crop, "water", and provide additional revenue. In a leasing program, land is not permanently dried up but is fallowed or set aside from irrigation for a number of years, depending on the conditions of the lease.

Leasing of agricultural waters could improve the economic stability of the agricultural-dependent communities of the Arkansas Valley. Growers could keep much of their land under production, fallowing only the necessary acres to meet the needs of the leasing agreements. Several ditch companies have already leased water and others are looking at the possibility of leasing water collectively as a group (Super Ditch). At this time, however, it is not clear how fallowing will affect yields, nutrients needs, ability to come back into production, and overall economics. This study attempts to address those issues.

Methods

This study was conducted with conventional tilled, furrow-irrigated corn on a calcareous Rocky Ford silty clay loam soil at Colorado State University's Arkansas Valley Research Center (AVRC) starting in 2007. The Center is located near Rocky Ford, Colorado. The plot area had previously been in corn during 2006. The corn hybrid RX752RR/YGPL (Dekalb) was planted in late April in each year. The crop was seeded at a rate of about 32,000 seeds per acre. A single line of corn was planted on top of a bed with a 30 inch row spacing (furrow to furrow). Conventional corn production practices were used throughout the course of the season. Irrigation was by gravity-flow furrows with water being applied to every other furrow (every 60 inches). The trial was

arranged in a complete block design with four replications. Starting in 2007, one treatment was planted to corn and the remaining three treatments were fallowed. In each subsequent year, one additional treatment was planted to corn. Fallowed treatments were managed to maintain low weed growth and prevent soil erosion. The sequence of treatments are described in the table below:

Treatment	2007	2008	2009	2010
1.	corn	corn	corn	corn
2.	fallow	corn	corn	corn
3.	fallow	fallow	corn	corn
4.	fallow	fallow	fallow	corn

Grain yields were collected in October or November of each season. Yield samples were taken within each treatment plot and assessed for total weight, moisture content, and grain bushel weight. In addition to yield, soil nutrient status was monitored via soil samples taken at depths of 0-8", 8-16", and 16-24". All production practices, including the practices and costs necessary to maintain the fallowed lands, were recorded.

Results

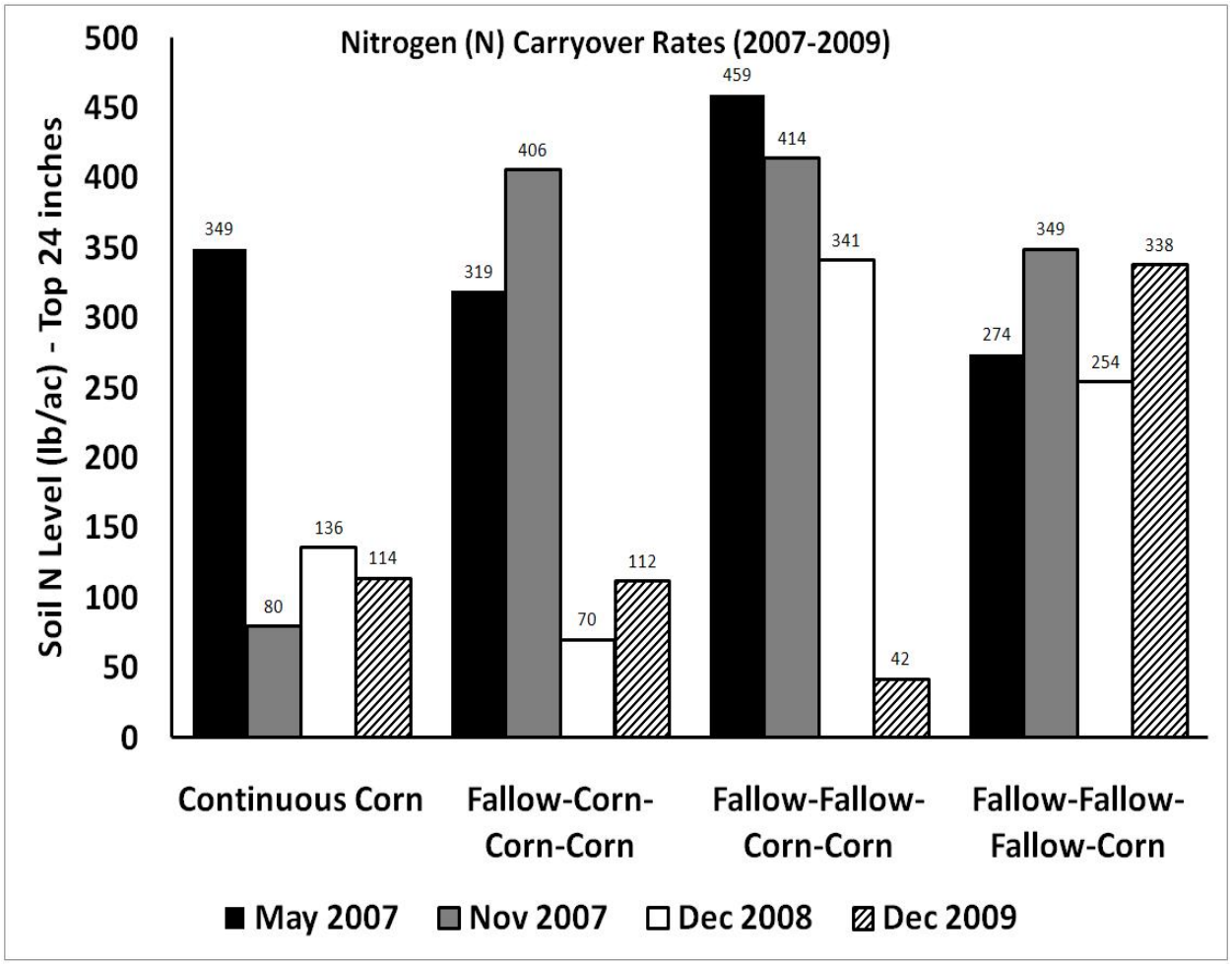
Table 1: Yield (bu/acre) of corn grown for grain following different fallowing periods. All yields were adjusted to a grain moisture content of 15.5%.

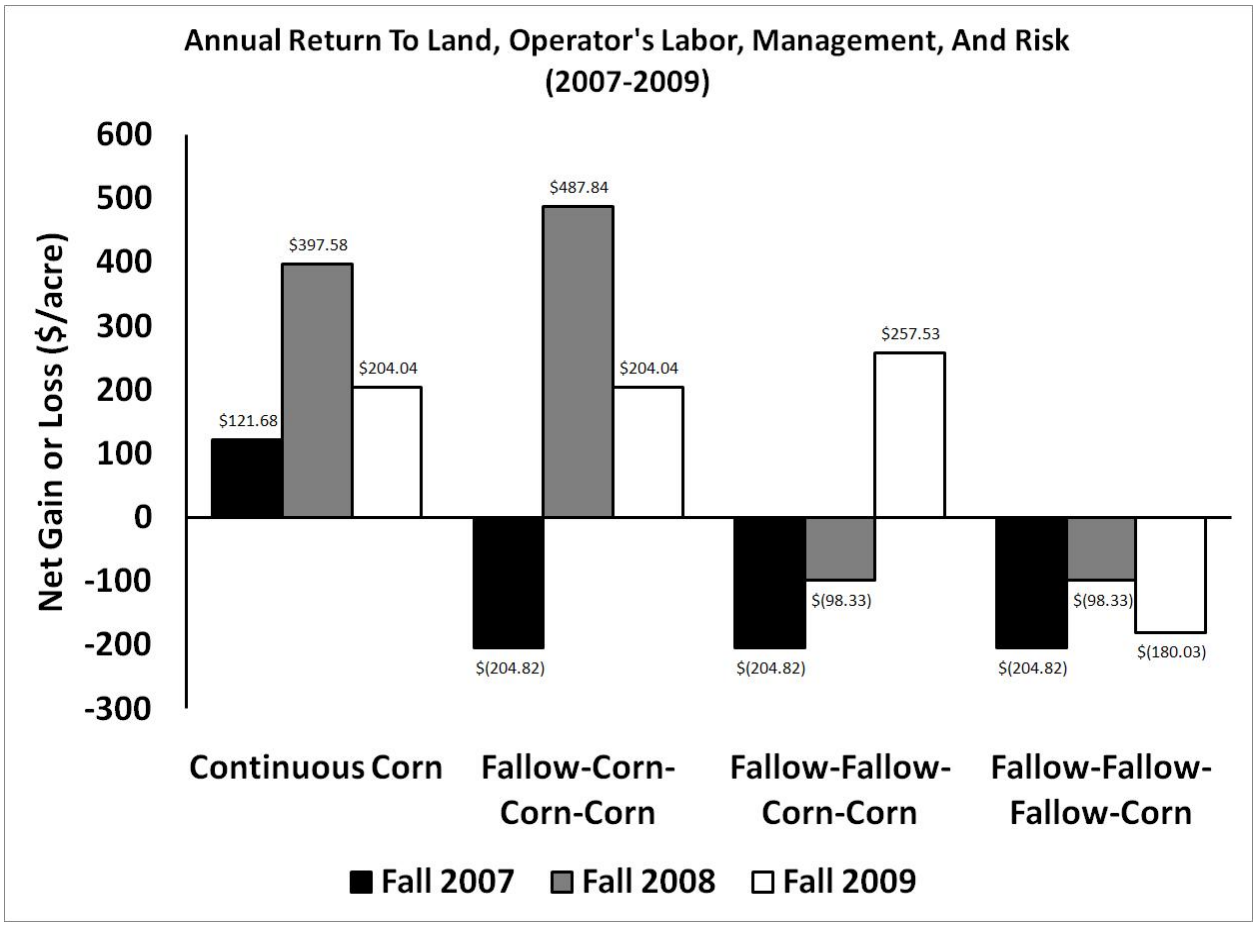
Treatment	2007	2008	2009	2010
		Yield Bu/acre		
1.	**187.1**	**232.8**	**204.4**	**223.1**
2.	*fallow*	**233.0**	**205.1**	**228.1**
3.	*fallow*	*fallow*	**204.7**	**218.4**
4.	*fallow*	*fallow*	*fallow*	**223.3**
lsd(0.1)		*ns*	*ns*	*ns*

Discussion

Through the 2010 season, no significant yield differences have been realized as a result of either one or two years of fallowing compared to a continuously cropped treatment. After two years of fallowing, fertilizer applied during the 2007 season was still available for a crop grown in 2009.

Specific fertility and production costs data will be presented in subsequent reports.


Nitrogen (N) Carryover Rates (2007-2009)
Soil N Level (lb/ac) - Top 24 inches
500
450
400
350
300
250
200
150
100
50
0
349
80
136
114
319
406
70
112
459
414
341
42
274
349
254
338
Continuous Corn
Fallow-Corn-Corn-Corn
Fallow-Fallow-Corn-Corn
Fallow-Fallow-Fallow-Corn
May 2007
Nov 2007
Dec 2008
Dec 2009


Annual Return To Land, Operator's Labor, Management, And Risk
(2007-2009)
Net Gain or Loss ($/acre)
600
500
400
300
200
100
0
-100
-200
-300
$121.68
$397.58
$204.04
$(204.82)
$487.84
$204.04
$(204.82)
$(98.33)
$257.53
$(204.82)
$(98.33)
$(180.03)
Continuous Corn
Fallow-Corn-Corn-Corn
Fallow-Fallow-Corn-Corn
Fallow-Fallow-Fallow-Corn
Fall 2007
Fall 2008
Fall 2009

2010 Vegetable Crop Reports

Onion Variety Trial

Mike Bartolo and Kevin Tanabe
Arkansas Valley Research Center
Colorado State University

PRODUCTION INFORMATION

Plots - *Planted 20' long X 2 rows on beds spaced 30" on centers. Rows were spaced 10" apart on top of the bed. Plants were hand-thinned to an in-row spacing ~3". Yield was determined from an 8' bed section (8' X 2 rows) of the plot. Each plot was replicated four times in the trial.*

Planted *– April 10th , 2010*

Fertilizer *- 104 lbs. P_2O_5/A and 22 lbs N/A as 11-52-0 - preplant. ~ 100 lbs. N/A residual (in top 18") and 34 lbs N as 46-0-0 supplied via irrigation water.*

Weed Control *- Roundup on April 22nd ; Goaltender and Prowl-H_20 on May 16th ; Goal 2E, Starane Ultra, and Outlook on May 26th ; Hand weeded 2 times*

Insect Control *– Movento on July 2nd* ***Disease Control****- None applied*

Irrigation *– The plots were irrigated multiple (11) times via gravity-flow furrows. The amount of irrigation water (consumptive use) was approximately 25" and seasonal precipitation was well above average at 11.02".*

Harvest *– September 24th* ***Grade*** *– October 7th*

Comments

The 2010 season was extremely challenging for onion production as a result of early spring conditions. March and April were extreme wet and cool. These conditions delayed planting about one month past the traditional planting date. Seeding was further complicated by cloddy and compacted soil conditions. Although early season conditions were difficult, there were very few insect and disease problems later. Specifically, there was no Iris Yellow Spot Virus or Xanthomonas detected in the plots. Further, the plots escaped any significant storm damage. Thrips populations were moderate and were fairly easy to control with a single application of Movento. Overall, plant growth and maturity were delayed and yields were well below historical averages. Please contact Mike Bartolo at the Arkansas Valley Research Center (phone: 719-254-6312; e-mail: michael.bartolo@colostate.edu) for additional information.

ONION VARIETY TRIAL

Arkansas Valley Research Center
Colorado State University, Rocky Ford, Colorado, 2010

Variety	*Source*	*Maturity (% tops down) 9-21*	*Colossals > 4" %*	*Jumbos 3"-4" %*	*Medium 2.25"-3" %*	*Pre-Pack 1.75"-2.25" %*	***Total Market. 50# bags/A***	*Culls %*	*Total Yield 50# bags/A*
Delgado	Bejo	30	0.0	42.6	46.5	4.0	**814.2**	6.7	872.2
T-433	Takii	30	0.0	40.7	50.5	4.8	**757.2**	3.8	786.3
NUN 8003ON (W)	Nunhems	55	0.0	40.7	52.5	3.5	**732.9**	3.2	758.4
Ranchero	Nunhems	40	0.0	44.5	43.9	2.7	**732.9**	8.7	804.9
Vaquero	Nunhems	40	0.0	36.6	48.6	5.0	**710.8**	9.5	778.2
Granero	Nunhems	65	0.0	33.1	52.0	8.5	**703.8**	6.3	749.1
Mesquite	D. Palmer	20	0.0	56.1	25.0	2.5	**695.7**	16.2	822.3
Tequilla	D. Palmer	27	0.0	57.5	26.7	3.1	**673.6**	12.5	758.4
X-Y201	Waldow	27	0.0	51.2	31.4	4.0	**666.7**	13.2	763.1
X-Y202	Waldow	22	0.0	43.8	32.8	3.9	**639.9**	19.3	790.9
Sarape Café	D. Palmer	67	0.0	22.8	57.4	12.2	**630.6**	7.3	680.6
X-Y441	D. Palmer	52	0.0	5.2	69.5	17.6	**626.0**	7.5	677.1
White Cloud (W)	Crookham	72	0.0	30.3	53.5	9.1	**622.5**	6.9	666.7
Calibra	Bejo	35	0.0	27.2	54.2	6.3	**602.8**	12.1	682.2
Joaquin	Nunhems	30	0.0	58.4	28.5	4.1	**595.8**	8.8	652.7
Oracle	Crookham	27	0.0	30.8	48.6	5.0	**592.3**	15.3	692.2
Colorado 6	Burrell	27	0.0	33.3	44.1	4.8	**578.4**	17.6	702.7
Esteem	Crookham	52	0.0	26.1	60.0	7.4	**577.2**	6.3	615.5
Maverick	Hazera	22	0.0	41.3	44.1	1.3	**576.1**	13.2	662.0
Advantage	Crookham	12	0.0	38.1	32.2	0.9	**572.6**	28.6	773.5

Variety	*Source*	*Maturity (% tops down) 9-21*	*Colossals > 4" %*	*Jumbos 3"-4" %*	*Medium 2.25"-3" %*	*Pre-Pack 1.75"-2.25" %*	***Total Market. 50# bags/A***	*Culls %*	*Total Yield 50# bags/A*
Arcero	Nunhems	27	0.0	35.2	47.2	1.8	**556.3**	15.7	649.2
NUN 7015ON	Nunhems	32	0.0	10.5	62.5	11.0	**551.7**	15.9	643.4
Cometa (W)	Nunhems	27	0.0	35.9	51.9	2.3	**545.9**	9.7	602.8
Desperado	Bejo	40	0.0	23.7	61.4	4.5	**533.1**	10.2	587.7
NIZ 37-64	Hazera	47	0.0	10.5	64.9	17.3	**524.9**	7.1	565.6
The Rock	Croohham	12	0.0	40.6	37.0	2.8	**523.8**	19.4	642.3
Legend	Bejo	15	0.0	19.2	47.0	7.0	**493.6**	26.6	669.0
7026	Nickerson-Zwaan	35	0.0	19.7	56.0	9.6	**457.6**	14.5	530.8
Pandero	Nunhemss	30	0.0	27.8	42.5	3.7	**456.4**	25.9	601.6
4001	Nickerson-Zwaan	37	0.0	12.3	55.5	14.5	**439.0**	17.5	515.7
7044	Nickerson-Zwaan	30	0.0	28.4	46.8	1.5	**439.0**	23.2	565.6
Crockett	Bejo	15	0.0	20.8	56.7	3.3	**426.2**	19.1	514.5
Talon	Bejo	42	0.0	4.4	63.9	13.2	**422.7**	18.4	495.9
Gunnison	Bejo	42	0.0	11.4	57.6	16.1	**421.6**	14.7	476.2
OLYX 0625	Crookham	15	0.0	26.0	43.4	3.2	**368.1**	27.2	491.3
						lsd (0.1) =	**89.7**		

(W) = white-skinned, (R) = red-skinned, all other yellows

Effect of Mulches on Organic Seed Production

Mike Bartolo and Jeff Davidson
Arkansas Valley Research Center
Colorado State University

The Arkansas Valley has a long and successful history of vegetable seed production and at one time, provided a significant portion of the cucurbit seeds used in the United States. Although seed production has diminished from its historically high level, there is still a sizable amount of conventional seed production in the Valley. In recent years, there has been a dramatic increase in organic vegetable production. As a result, demand for organic vegetable seed is growing rapidly as the USDA National Organic Program requires organic farmers to use certified organic seed when available. With this potential, there may be an opportunity to re-establish the seed production industry in the Arkansas Valley.

As part of the process of enhancing seed production, there is a need to determine which production practices work best under organic conditions. Accordingly, the objective of this trial was to determine how different mulching methods influence watermelon fruit and seed yield.

Methods

This study was conducted at the Arkansas Valley Research Center (AVRC) in Rocky Ford. The Center has a four acre site that has completed the transition into organic production. Beds, 45 inches wide and 60 inches between centers, were shaped in early April. Drip lines were placed near the center of the bed at a depth of 3 inches . The study was designed as a randomized complete block with four replications. There were three treatments:

1. Unmulched (bare ground)
2. Straw Mulch
3. Black Plastic Mulch

One treatment was covered with black embossed plastic mulch on June 3rd using a one-bed mulch layer. On June 11th, the open-pollinated watermelon variety *Crimson Sweet* was sown in hills down the center of the bed at an in-row spacing of 3 feet. The seeds were placed into holes in the black plastic mulch at the same in-row spacing. The straw mulch treatment was not applied until the watermelons had reached the 2-3 leaf stage.

At that stage, wheat straw was uniformly distributed over the plot area at a rate of 9,700 lbs per acre.

Pest control, irrigations, and other management practices were implemented as needed.

On September 13th, watermelon from each plot were individually harvested and weighed. A representative sample of seed was extracted from watermelons in each plot to determine estimated seed yields.

*** *Cost analyses of all production practices will be outlined in a subsequent report*.

Fruit yield and raw seed yield of *Crimson Sweet* watermelon grown with different mulching methods .

Treatment	***Fresh Yield per Acre (lbs)***	***Raw* Seed Yield per Acre (lbs)***
Bare Ground	20,812 b	94.5 b
Straw Mulch	24,466 b	111.1 b
Black Plastic Mulch	49,600 a	225.2 a
lsd(0.1)	8,993	40.8

Organic Vegetable Variety Evaluation

Family Farmers Seed Cooperative, Organic Seed Alliance and CSU-AVRS

Colorado Watermelon Variety Trial 2010

Variety	Count	Disease	Maturity	Sweetness	Flavor	Color	Texture	Comments
Allsweet	19	8	7	3	3	7	9	Small seeds - great texture
Black Diamond	17	2	7	3	1	5	1	
Blacktail Mountain	19	4	9	7	5	9	5	Small seeds - all over ripe - hard to tell
Charleston Grey	19	3	5	7	3	5	9	
Jubilee	14	3	7	5	7	7	3	FFSC Long pale green - old school
Navajo Red	34	2	7	5	7	1	5	
Sugar Baby	21	2	9	5	5	7	5	
Sweet Dakota Rose	23	2	7	6	9	3	7	
Wilson Sweet	34	2	9	9	7	9	5	

FFSC Colorado Melon Variety Trial 2010							
Variety	Count	Disease	Ripeness	Sweetness	Flavor	Color	Comments
Eden's Gem	44	1	9	3		G	
Eindor	26	7	4	9	8	5	Anana type - needs hot and dry - not musky - 2 sets of ripening - exterior gold @ ripe
Golden Honeydew	26	3	3	5	1		Muskmelon - only 1/3 ripe before the vines are dead
Grecale F1	24	6	6	9	8	Y-G	Yellow canary - Long yellow - big fruit
Hale's Jumbo	25	3	9	4	3	5	Musky and watery overripe
Honeydew Green Meated	15	4	1	9	3	G	Honeydew - Big honeydew but very late
Huerfano Bliss	27	3	7	5	7	3	Lots of promise - may be segregating for interior flesh
Kiaria F1	26	5	3	4	1	5	Charentais - this and the other charentais are bitter
Navigator F1	29	5	7	6	4	8	Western Shipper - Poor flavor and not sweet, sweet in an overripe fruir - but huge and poor taste
Pett Gris de Rennes	22	3	3	3	1	5	Charentais - off flavor with bitterness, very late
PMR 45	28	3	7	5	5	7	Very good considering
Sharlyn	24	7	2	8	8	Y	Ananas - small early set (only problem) - too many late, lemon tint - The major drawback of this is how late it is
Tirreno F1	27	7	1	8	8	6	Italian - 2-3 waves of ripeness - excellent firm texture but kind of late, not ripe in this rep - 1 ripe with
Top Mark	32	2	5	6	3	6	Western Shipper - Even when blown away by disease still is good, late with vines

FFSC Colorado Pepper Variety Trial 2010									
Variety	Percent Ripe	Canopy	Disease	Flavor	Yield	Heat	Thickness	Trueness	Comments
122-07	35%	4	7	7	7	3	6	5	Sunburnt, maybe worst in field, chocolate red, true segs
123-071		6	5	5	7	7	9	5	Very thick, but too hot, star
140-09	5%	6	7	7	5	7	6	5	Very tall and crack easily
145-09		8	8				6		Star
146-09		6	5	7	5	5	6	segregating	Healthy, swet-tart, hot creeping heat, segregating, noce shape, glossy
147-09									DISEASE, very small plants that are stunted
153-09		9	7	4	4	6	9	5	Excellent foliage, great little fat cherry bomb
154-09									Segregates with lots of sunburn
156-09	4%	7	4	3	5	5	5	5	Poor flavor, heat follows, smooth skin, glossy
159-09		7	7	9	9	5	7	7	
163-09	0%	6	5	4	1	2	3	3	Bladito, very late
Big Jim	3%	7	5	5	5	4	3	3	Crispy, variable in heat, segregation noticeable, ridging, not smooth
BM-102	5%	8	6	7	6	3	3	7	Sweet, good and piquent
BM-103	0%	9	8	3	3	2	7	3	Difficult pick, too thick of canopy, fruit in middle, extreme segrgation of fruit
BM-120-07	5%	5	5	3	2	2	8	Fruit 3	Leaf dropping, length segregating, almost like green bell
BM-122-08		7		6		3	5	4	Flavor good, little bite, blocky type compared to NM
BM-130-08	5%	8	8	5	4	2	6	3	Healthy, 1 complete off-type, poor fruit set, wilted, undeveloped
BM-132-08	10%	6	5	6	4	7	9	Shape 4 to 7	Hard to catagorize, small, crossed with Jalapeno? Good population
BM-133-08		3	7	5	9	7	8	9	Heat, star
BM-134-08		3	9	9	9		6	7	This is the best line in the field for crown set, also one of the shortest in the field
BM-137-08		6	8	4	4	5	5	4	Good color, sgregating more at bottom
BM-138-08									poor stand and poor plants
BM-139-08		7	7	9	5	7	9	5	This has some of the best plants, excellent thinkness, but segs, some star plants
CSU-002	85%	3	3	3	7	1	3	7	Excellent set and ripeness, but disease, retry
CSU-01-064 (2003)		4	9		9	7	5	7	Nice short plant
Espanoloa Imp	70%	2	1	6	7	5	1	5	Early, earliest in field, bedragled for disease
Joe Parker	10%	6	5	4	6	2	4	Plant 8, fruit 9	Few red fruits, colar variable, sweet with hints of flavor, heat following
Mosco	70%	3	7	7	7	6	8	Friut 7, plant 3	concentrated, flavorful, yield good, few leaf dropping
Santa Fe Grande	70%	4	5	6	6	7	2	2	Yield concentrated, bitter, creeping heat, don't like bitter end

Pepper Foliar Nutrient and Growth Regulator Trial

Michael Bartolo
Arkansas Valley Research Center
Colorado State University

MATERIALS AND METHODS

This study was conducted at the Arkansas Valley Research Center (AVRC) in Rocky Ford. The study was designed as a randomized complete block with four replications. The pepper variety *Sonora* was direct-seeded and grown with standard production methods.

Treatment combinations and timing of applications for foliarly-applied fertilizers and growth regulators

#	Treatment	Rate Per Acre	Stage First Bloom July 13, 2010	Stage First Bloom + 14 days July 27, 2010	Stage First Bloom + 28 days Aug. 10, 2010
1.	Untreated Control	-			
2.	MKP	5 lbs	Yes	Yes	No
3.	MI ZMB	1 qt	Yes	No	No
4.	MKP MI VC	5 lbs 1 qt	Yes Yes	No No	No No
5.	MKP MI VC Ascend	5 lbs 1 qt 3.2 oz	Yes Yes Yes	Yes Yes Yes	Yes Yes No
6.	MI ZMB Ascend MKP	1 qt 3.2 oz 5 lbs	Yes Yes No	Yes Yes No	Yes No Yes
7.	MI VC	1 qt	Yes	Yes	No

Table 1: Yield and fruit weight of chile peppers (Var. Sonora) treated with foliar applications of fertilizers and growth regulators.

#	Treatment	Average Fruit weight (g)	Yield per Acre (lbs)
1.	Untreated Control	72.54	20,582
2.	MKP	67.50	17,914
3.	MI ZMB	69.42	18,022
4.	MKP MI VC	69.60	17,587
5.	MKP MI VC Ascend	65.55	20,364
6.	MI ZMB Ascend MKP	71.03	21,725
7.	MI VC	70.78	20,146
lsd (0.1)		ns 12.42	ns 5,158

Watermelon Foliar Nutrient and Growth Regulator Trial

Michael Bartolo
Arkansas Valley Research Center
Colorado State University

Watermelon is an important vegetable crop in the Arkansas Valley grown on over 1,500 acres. Watermelons grown in the Valley are renowned for their high quality. Intensive production practices that include plastic mulch and drip irrigation have dramatically improved watermelon yields. Regardless, improving the yield and sugar content is a constant goal of producers. This study was conducted to examine the response of watermelon to several commercially available fertilizers and growth regulators applied as a seed treatment or to the foliage starting at the time of first bloom.

During the seasons environmental conditions were favorable for melon production. Overall, there was not a significant effect on yield and sugar content (% brix) by any treatment.

MATERIALS AND METHODS

This study was conducted at the Arkansas Valley Research Center (AVRC) in Rocky Ford. Beds, 45 inches wide and 60 inches between centers, were shaped in early April. Drip lines were placed 1-2 inches from the center of the bed at a depth of 3 inches. The beds were covered with black embossed plastic mulch on May 5th using a one-bed mulch layer.

The study was designed as a randomized complete block with three replications. On June 4th, the watermelon variety *Starts and Stripes*, an elongated seeded type, was sown in holes in the plastic mulch down the center of the bed at an in-row spacing of 36 inches. Foliar Blend ® was applied at a rate of 24 oz. per acre at seeding as a soil drench in 50 gal. per acre water. Foliar fertilizers were applied starting at the first bloom stage (July 13). All products were delivered with a hand-held sprayer with water (30 gal per acre) and non-ionic surfactant 0.1% v/v. Watermelon were harvested starting on August 23rd. Watermelons were considered marketable if they weighed over 10 lbs. and were free of any physical defects.

This work was generously supported by Winfield Solutions under the direction of Mr. Joe Bush and Allied Genetics under the direction of Brian Roth.

Treatment combinations and timing of applications for foliarly-applied fertilizers and growth regulators.

#	Treatment	Rate Per Acre	Stage First Bloom July 13, 2010	Stage First Bloom + 14 days July 27, 2010	Stage First Bloom + 28 days Aug. 10, 2010
1.	Untreated Control	-			
2.	MKP	5 lbs	Yes	Yes	No
3.	MI ZMB	1 qt	Yes	No	No
4.	MKP MI VC	5 lbs 1 qt	Yes Yes	No No	No No
5.	MKP MI VC Ascend	5 lbs 1 qt 3.2 oz	Yes Yes Yes	Yes Yes Yes	Yes Yes No
6.	MI ZMB Ascend MKP	1 qt 3.2 oz 5 lbs	Yes Yes No	Yes Yes No	Yes No Yes
7.	MI VC	1 qt	Yes	Yes	No
8.	Foliar Blend ®	1 qt	Yes	Yes	No

**Foliar Blend ® was also applied at a rate of 24 oz. per acre at seeding as a soil drench with50 gal. per acre water.*

RESULTS

During the seasons environmental conditions were favorable for melon production. Overall, there was not a a significant effect on yield and sugar content (% brix) by any treatment (Table 1).

Table 1: Yield and quality of watermelon treated with seed and foliar applications of fertilizers and growth regulators.

#	Treatment	% Brix	Yield per Acre (lbs)
1.	Untreated Control	10.3	34,210
2.	MKP	10.6	33,549
3.	MI ZMB	9.9	27,337
4.	MKP MI VC	9.6	35,388
5.	MKP MI VC Ascend	10.7	29,862
6.	MI ZMB Ascend MKP	10.2	36,154
7.	MI VC	10.7	36,590
8.	Foliar Blend ®	10.3	29,862
lsd (0.1)		ns 1.0	Ns 14,355

Large and Reference Lysimeter Narrative Log 2010

Lane Simmons

January 6, 2010

A presentation was given at the annual AES Research Center Conference on the Campus of Colorado State University. Lane's presentation was on the construction of the two weighing lysimeters at the AVRC. Alan Andales gave a presentation on some of the lysimeter project's data analysis.

January 28, 2010

Tom Ley sent an email suggesting that the dip switches and wiring inside the large lysimeter HMT331 be checked. This temp/rh sensor had not been tracking with the other lysimeter and RFD01 temp/rh sensors since the 331 was returned from recalibration. The other sensors used for comparisons were HMP45 units. Historically, the 331 had tracked well with the 45's. Apparently, the only portion of the 331 that did need recalibration was the relative humidity portion of the device.

Per Tom:

- Each bank of dip switches should only have #2 and #5 set to ON. All others should be OFF. *Disconnect power before adjusting switches.*
- On the wiring terminal blocks, analog output 1should have a read wire (RH) in Ch1+. Analog output2 should have a green (T) wire in Ch2+. Analog output 3 should have a white (Td) wire in Ch3+.

While checking as per Tom Ley, the following was noted:

- The Ch2 (temperature) green and black wires were somewhat tangled, putting pulling-pressure on each wire. The black wire was untangled, and reconnected to the Ch2- port.

- The flat, rainbow colored, pin cable was disconnected from the Ch3 port. However, this may have come disconnected when the unit was opened. Because it was so cold during the service, the cable was very stiff.

March 12, 2010

Lane Simmons attended an evapotranspiration workshop at the Drake Centre in Fort Collins. Speakers included Marvin Jensen, Richard Allen, Allan Andales, Luis Garcia, Ray Alvarado, Dick Wolfe, Nolan Doesken, Mark Crookston, Tom Ley, and Ivan Walter.

April 8, 2010

Four Watermark sensors were installed in the Reference Lysimeter inner tank; Sensors were to be installed at the following depths: 70mm, 0.5m, 1m, and 2m. Installation was a bit cumbersome due to the advanced growth and height of the wheat. Because of this, the actual depth achieved was approximately ½" less that the target depths for the 0.5, 1, and 2 meter depths.

In order to install, and later remove each Watermark, ½ inch class 315 PVC pipe was attached to all but the 70mm sensor. Each piece of PVC was cut to length, and the sensor wiring was threaded through the PVC. The sensor was then secured to the PVC with PVC/ABS cement. A 'T' was attached to the opposite end of each PVC length to serve as a handle and to aid in making the unit water resistant. The side of the T that served as an exit for the sensor wiring was plugged with duct clay and duct tape. The other side of the T was capped with a PVC plug, glued in place.

Prior to installation, the sensors underwent a soak-dry cycle as recommended by Campbell Scientifics' Watermark literature. During this process, it was discovered that water would find its way into the PVC handle and create a reservoir of water. At the recommendation literature provided by Allan Andales, a 1/8" hole was drilled in the PVC pipe, directly above the sensor unit. This hole is meant to serve as a drainage hole for any water that may accumulate in the pipe. Interestingly, the recommendation was not found in the Campbell Scientific Watermark literature on-site.

Mike Bartolo performed the actual insertion of the sensors into the soil. A soil sampler was used to bore the holes to-depth. Water and soil were introduced into each hole during installation to ensure good sensor/soil contact.

While maintaining the identity of each cable and sensor, the cables were cut at the above and below ground junction boxes, and reattached using the terminal strips. The sensors are not yet attached to the CR7 datalogger pending a new logger program and wiring instructions.

April 14, 2010

Dale Straw was on-site to wire the Watermarks to the CR7. Miscellaneous lysimeter work was conducted, including draining the outer LL drainage tank, reattaching the LL Q7, and reattaching the LL light bars.

May 25, 2010

David Groeneveld and Dave Barz of HydroBio in Santa Fe, NM toured the two lysimeters as guests of Dale Straw and Tom Ley.

June 9, 2010

Today the LL aerial camera stand was erected.

A length of 3" PVC, capped at the bottom end, was set 24" deep in the soil approximately 10" exterior to the south edge of the inner tank. The PVC was positioned 5' from the west and east sides of the inner tank. Approximately 5" of the PVC protrudes from the soil. A 14' x 2-3/8" OD aluminum tube was used for the lower portion of the vertical leg. Four bolts were inserted into the distal end of the aluminum tube through drilled and tapped holes. These bolts are used to secure the upper portion of the vertical leg which is made of 1-3/4" EMT tubing. The aluminum tubing originally planed for use on the upper vertical portion proved to be too large in diameter and would have made disassembly and/or telescoping action very difficult. The horizontal cross arm is 1" OD aluminum tubing secured to the vertical component using a Campbell Scientific CM210 cross arm-to-pole mounting kit. The camera is attached to the horizontal cross arm using a custom made attachment. A Canon ET-1000N3 extension cord and Canon RS-80N3 remote switch were used to activate the camera.

An adjustment may need to be made to the length of the horizontal cross-arm in order to capture the north side of the monolith. Erecting the stand was not terribly difficult. It was erected with two people; however, it would have been much safer with three. As currently constructed, this is defiantly a three-man job. The design may need to be modified, to take better advantage of the telescoping action, perhaps making this into three sections. The first pictures were taken from a height of 20.5-feet.

June 18, 2010 and June 21, 2010

As part of general lysimeter studies, and as part of Allan Andales' Colorado Conservation Innovation Grant project entitled 'Using the ASCE Standardized Reference Evapotranspiration Equation and Appropriate Crop Coefficients for Irrigation Management in Colorado', soil moisture sensors were installed in the LL alfalfa field.

Four Watermark soil moisture sensors, and one soil thermistor were installed south of the eastern exterior NMM access tube, and an identical sensor set was installed south of the southern exterior NMM access tube. At each location Watermarks were installed at 2m, 1m, 0.5m, and 7cm; the thermistor was installed at 1m. Each sensor set was wired into its own Hansen datalogger. The dataloggers were mounted on a 2x8 that was attached to the cotton shelter's supporting pipe. The 2x8 was mounted such that a rain/weather cap can be placed over the loggers.

The current design of the LL exterior NMM access tubes allows the portion of the tube that protrudes from the soil to be removed prior to harvest. This 'break-away' design allows for the custom hay harvesters to drive their machinery over the top off the access tubes, eliminating the need to maneuver around the installations and eliminating the need for hand-harvesting the hay around the NMM tubes. The primary purpose of this design was to make things more convenient for the custom hay crew. There are an increasing number of obstacles in the lysimeter field so consideration of field operations and outside contractors is important. With this in mind, it was decided that the Watermarks wouldn't be installed with several inches of PVC conduit protruding from the ground. Instead, the top of the PVC is level with the soil surface. The cables running from the sensors to the dataloggers are above ground and will be coiled up and set aside prior to harvest.

Each thermistor was installed at 1m. A 1m post hole was dug; the thermistor was placed at the bottom of the hole and carefully backfilled, tamping every 5-6 inches to ensure good soil contact.

The wiring attached to the thermistor was not long enough for a 1m install so a wire extension had to be spliced to the existing wire.

Each Watermark, with the exception of the 7cm unit, is glued to a length of PVC. There is a small drainage hole at the distal end of each PVC length to allow water, which may enter the PVC tube, to escape. A 90-degree PVC elbow was attached to the top end of the PVC tube. The Watermark cable runs from the sensor unit through the PVC and out through the elbow. The elbow is sealed up with silicon and tape. Each sensor wire (four Watermarks and one thermistor) are attached to an extension wire using a Weidmuller terminal strip. The strip was placed inside a small, weather resistant, electrical 'elbow' box. The box's access holes were size reduced and plugged with duct clay. This system allows disassembly and cable removal prior to harvest; hopefully, allowing the harvesters to operate directly above the sensors.

With this design there is a risk of water entering the PVC and/or the junction box; there is also a risk of hay machinery damaging or cutting the wiring that can not be rolled up. These potential downsides may require a future change of installation. Also, in the future, the sensors might be connected directly to the LL CR7 dataloggers below ground.

Week of July 12, 2010

The hay swather did cut the Watermark wiring that emerged from the ground. The Watermark datalogger cables were reattached to the remaining wiring with a simple twist and single wrap of electrical tape. The small weather enclosures and terminal strips were not used. The resulting data and upcoming 3rd cutting will be monitored to assess the results of this attachment method.

July 20, 2010

The four exterior RL NMM tubes were removed in anticipation of upcoming field work and planting the new alfalfa crop on the RL.

August 17, 2010

The RL monolith was prepped for alfalfa planting. The shallow soil temperature sensors, heat flux plates, and the 70mm Watermark sensors were removed, while the NMM access tube, the three deep soil temperature sensors, and the three deep Watermark sensors were left in place. The 70mm Watermark was also removed because the unit appears to be faulty. After the sensors were removed, the monolith soil was spaded, raked, and re-furrowed. While the tractor was able to perform field operations very close to the lysimeter, there were some exterior areas that also needed tillage and soil prep performed by hand. Once the area surrounding the monolith was tilled and leveled, it became apparent that the monolith soil surface was too high, so couple of inches of soil was removed from the monolith surface. After the monolith surface was close to its finish grade, the sensors that had been removed were replaced, with the exception of the 70mm Watermark. Finishing touches were then made to the monolith surface. Efforts were made to mitigate the possibility of ending up with the monolith and exterior area having two slightly different elevations, similar to the current situation on the large lysimeter.

Kevin Tanabe performed the final ground work in the surrounding field. After the recent RL wheat harvest, there was a substantial amount of straw remaining in the field. Normally, the straw would have been burned or the entire field would have been baled. Some of the straw was baled

into small bales for AVRC use. For some logistical, economic, and timing reasons, the entire field was not baled.

Because of this, Kevin Tanabe and/or Lane Simmons had to disk several times, and then plow to turn the stubble and straw under. This was followed by another round of disking, mulching, and then leveling. The field work occurred over the course of the previous week.

August 19, 2010

The reference lysimeter field was planted to alfalfa.

Syngenta GENOA Alfalfa Variety
Coated Seed
Treated with Aproxn XL
Coated with Optimize Gold
Lot Code on Bag: 2873061
Net Weight per Bag: 50 lbs

Assumed Field Acreage: 8.8 acres
Seed Applied: 191.5 lbs
Seeding Rate: 21.76 lbs/acre
Seeding Goal: 19 – 20 lbs/acre

This is the same alfalfa variety planted in the large lysimeter field in 2007; although, the LL field was planted with non-coated seed.

There was some question as to the correct seeding rate when using coated seed vs. non-coated seed. Jeff Davidson contacted Syngenta who stated that coated seed results in less seed per pound, or per bag, but the coated seed is more viable, with a higher germination rate. So it was Syngenta's recommendation that the seeding rate for both seed types remain the same.

Problems were encountered during attempts to set the seeding rate on the drill. Problems were also encountered early on, when the drill's rate setting was low, with the tubes plugging up. As a result, it took 2.5 trips over the field to apply all of the seed. And it became difficult to achieve the seeding rate goal.

After planting, the field was furrowed into 30" beds and then roller-packed to ensure good seed/soil contact. The first anticipated irrigation is on Monday August 23rd.

Mike Bartolo hand planted the lysimeter surface and the areas around the lysimeter that were inaccessible to the tractor and drill.

August 30, 2010

Mike Bartolo and Lane Simmons gave a short talk to twenty-four students, including senior undergraduate and graduate students, who were enrolled in the WR 420 Watershed Practicum, offered through CSU's Warner College of Natural Resources. The class was taking part in a multi-day field trip touring Colorado basins learning about watershed management. The students stayed approximately 50' away from the large lysimeter in order to minimize any possible disturbance.