On-Farm Drip and Furrow Flood Irrigation in Annual and Multi-Year Crops

ADI

Annual Report

2006

Submitted by

Texas A&M University-Kingsville, Citrus Center

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and

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Drip and Furrow Flood Irrigation in Annual and Multi Year Crops:

Texas A&M University-Kingsville and Texas A&M Extension Service have teamed together to establish various water conservation demonstration sites throughout the Lower Rio Grande Valley (LRGV). The project managers (Dr. Shad Nelson, TAMU-Kingsville and Dr. Juan Enciso, TAES, Weslaco) have made contact with 12 growers/collaborators in the Valley to monitor on farm irrigation at different demonstration sites. These sites encompass a variety of crops including, but not limited to young and mature citrus (grapefruit, orange and tangerine), onions, celery, tomato, corn, cotton and sorghum. Irrigation practices to grow these crops are flood, polypipe furrow/flood, drip, and microjet spray.

Current aim this past year has been to establish contact with collaborators/growers in the LRGV willing to work with us to monitor water use and crop production over a long period of time. This work was initiated in late spring to early summer 2005 where initial cooperation was challenging among growers in the Valley. After several months of developing relationships of trust with Valley growers that informal discussion resulted in more firm collaborative commitments. By the end of 2006 we had 14 committed growers as willing participants to collaborate with us in on farm water conservation demonstration sites. Many of these sites have more than one cropping system for monitoring.

Our initial goals for demonstration sites is not to redirect the water management practices of the growers, so that we can establish a "baseline" data base that represent water use in the Valley. The baseline data will be used to evaluate water consumption per cropping system and irrigation method. It is projected that this collection of baseline data will continue through Project Year 2 (2006). To assist in monitoring water use and crop water consumption each site has been (or is in process of being) equipped with soil moisture sensors with real-time automatic data logging units. On-site rain gauges are also (or will be) supplied and attached to data logging equipment for determination of annual rainfall and for verification of when irrigation events occurred versus rain events. This data will be collected and monitored in tandem with water metering equipment. Water meters are (or will be) supplied at each location to keep track of the quantity of water applied during an irrigation event and over the growing season to each cropping site. The collection of this data is in its initial stages and not a lot of concrete information has been gathered over the past year as the main priority has been to establish new sites and commitments with collaborators.

Current Collaborators:

The following is a list of current collaborators, the types of crops monitored during the fall 2005 and spring 2006 period. The list also covers the type of soil moisture sensing equipment and rain gauge systems in place. Depths of 6”, 12’, and 24”, soil moisture sensors will be placed within the soil profile or bed. Current collaborators under the direction of Dr. S. Nelson (and PhD candidate Ram Uckoo and Eddie Esquivel- Project Coordinator) and Dr. J. Enciso (and science technician Xavier Peries) are listed below.

Field Sites under direction of Dr. Nelson & Eddie Esquivel:

ID ref #01 5 cropping sites

-01a for block ref. Rio Red (narrow borders), 73 acres
-01b for block ref. Valencia (flood); 15 acres
-01c for block ref. Rio Red (narrow borders), 85 acres
-01d for block ref. Onion 2005 White/Red var. (Drip), 12 acres
-01e for block ref. Onion 2005 Yellow var. (Drip), 52 acres
Installed: 2 ECHO probe locations; one rain gauge, 2- WatchDog Data loggers with 3 sensors per site

ID ref #02 3 cropping sites

- 02a for block ref. Rio Red (microjet), Henderson grapefruit (narrow borders), 14 acres
- 02b for block ref. Rio Red (narrow borders), 5 acres
- 02c for block ref. Ruby Red (drip), 4 acres (not working at this time)

Installed: 2 ECHO probe locations; one rain gauge, need to install one location with Installed WatchDog data logger and Watermark sensors, also installed new 10” water meter with one 3” meter on drip location.

ID ref #03 1 cropping sites

- 03a for block ref. Rio Red grapefruit, (traditional flood), 41.3 acres

Installed: ECHO probe in Rio Reds; rain gauge and new Irrometer Watermark monitor with digital readout along with watermark sensors.

ID ref #04 2 cropping sites

- 04a for block ref. Rio Red grapefruit (Drip), Marrs orange, Pineapple orange, Tangerine, 86 acres
- 04b for block ref. Rio Red (Micro-jet), Marrs orange, 30 acres

Installed: 2 ECHO probe locations; 2 WatchDog datalogger w/ Watermark sensor; one rain gauge

ID ref #05 1 cropping sites

- 05a for block ref. White Onions-2.5 acres, yellow and red onions-19.5 acres (Subsurface drip irrigation)

Installed: 1 ECHO probe locations; one WatchDog Rain Logger; one rain gauge

ID ref #06 2 cropping sites

- 06a for block ref. Rio Red Grapefruit (Drip/Microjet Irrigation), 1.1 acres

- 06b for block ref. Rio Red Grapefruit (Traditional Flood), 1.0 acre
Installed: 1 ECHO probe locations; one WatchDog Rain Logger; one rain gauge

Field Sites under direction of Dr. Juan Enciso and Xavier Peires:

ID ref #021 2 cropping sites
-021a for block ref. (2006 Cotton), 3.5 acres
-021b for block ref. Grain Tank (2006 Cotton), 100 acres
ID ref #022 1 cropping sites
-022a for block ref. Honeydews Spring 2006, 3 acres
ID ref #023 1 cropping sites
-023a for block ref. Oranges MJ (2005-2006-2007), 13.4 acres
ID ref #024
-024a for block ref. Rio Red grapefruit (2005-2006-2007), 7 acres **1 cropping sites**
ID ref #025
-025a for block ref. (Onion 2005-2006), 56 acres **1 cropping sites**
ID ref #026
-026a for block ref. (onion 2005-2006), 15.7 acres **1 cropping sites**
ID ref #027 1 cropping sites
-027a for block ref. Irrigation Scheduling SDI Onions 2005-2006, 0.65 acres
ID ref #028 4 cropping sites
-028a for block ref. 68 (MJ Oranges), 8 acres
-028b for block ref. 73 (Drip Grapefruits), 8 acres
-028c for block ref. 74 (MJ Grapefruits), 8 acres
-028d for block ref. 76 (Drip Oranges), 7 acres
ID ref #029 1 cropping sites
-029a for block ref. Low Pressure irrigation SDI - Cotton 2005-2006, 2.6 acres

Project Plans for the Demonstration Sites for Mar 2006-Feb 2007:

All sites require metering devices. This project year will focus on accurate metering of water. Improvement in how metering data is collected will be discussed with the collaborators listed below. Many growers have this equipment, but improvement in data collection and accuracy is needed.

All sites require rain gauge metering devices. This year will focus on installing automatic rain collection at each site.

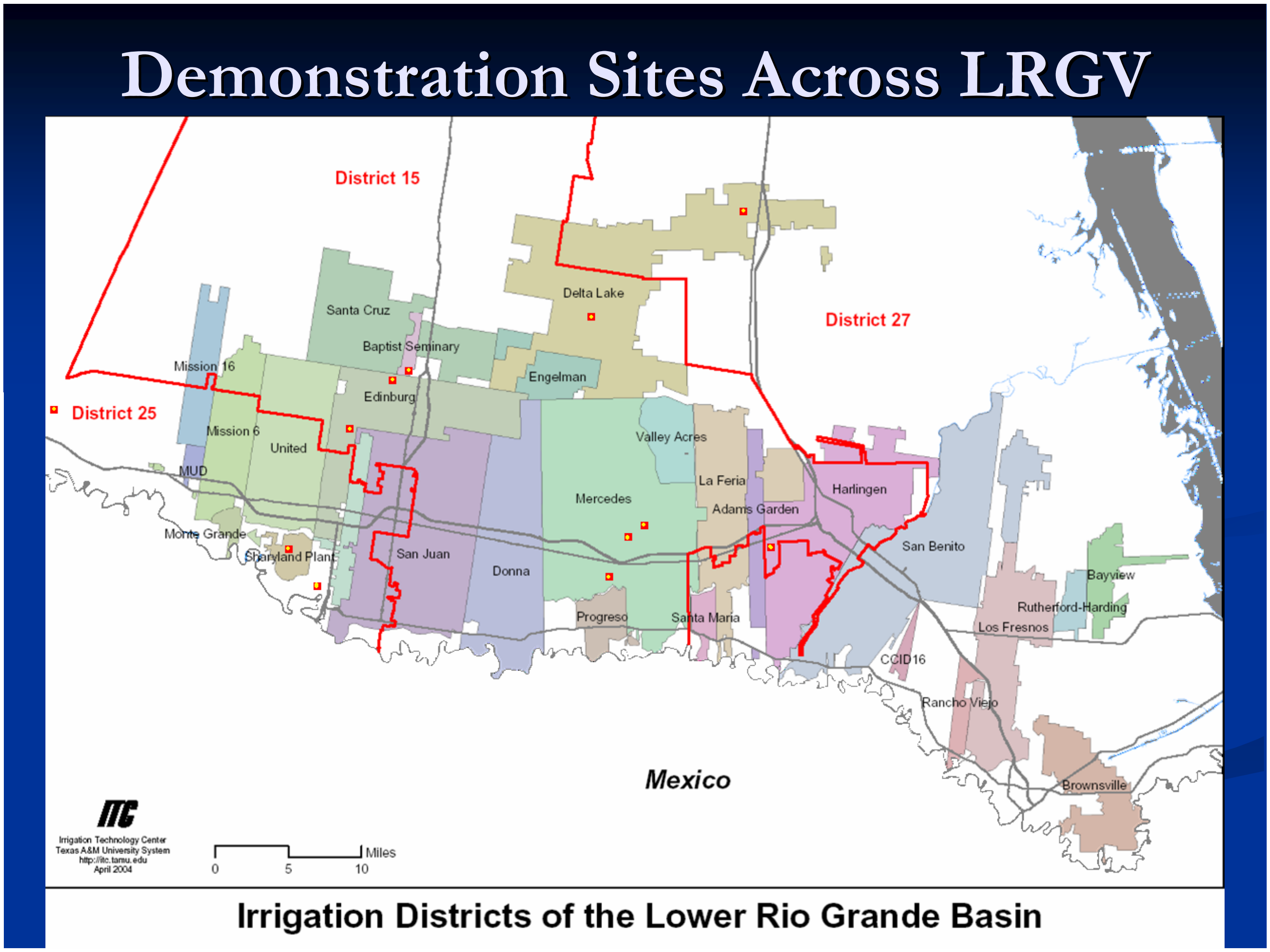
Soil moisture sensing devices will collect data for the purpose of evaluating to what depth irrigation water is moving within different cropping systems and soil types. These soil moisture sensors will also serve as a means of determining when irrigation events occurred and will be used to validate or check against rainfall and water metering data.

Total irrigation and rainfall distribution will be used at the end of the growing season and compiled with harvest data to determine water use efficiency (WUE) and irrigation use efficiency (IUE) for citrus and annual crops in the Valley.

An objective is to compile the data in a GIS program where this data can be displayed for specific locations in the Valley where the demonstration projects are located.

Reporting: A total of two quarterly formal reports were turned into the Harlingen Irrigation District (HID) in August and November 2006 detailing work accomplishments. One informal quarterly report summary was provided to HID.

Map of Demonstration Sites for ADI:



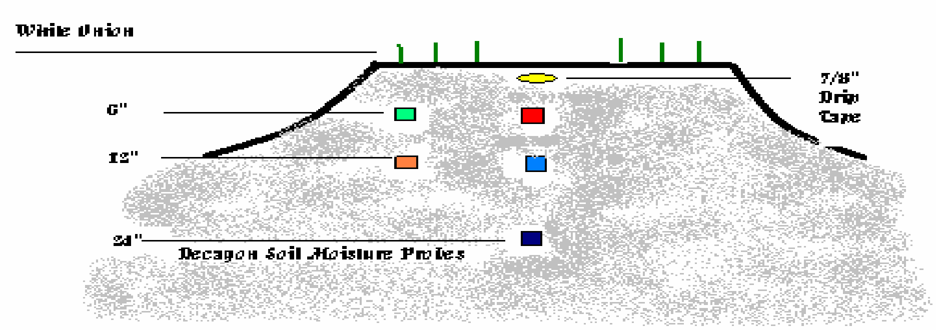
Above: Red dots indicate current collaborators throughout the Lower Rio Grande Valley.

Soil Moisture Determination:

Decagon ECH$_2$O® probesEC-10 and EM-50 are installed two weeks after initial planting on ADI collaborator #5 from Willacy County.

Above: Decagon data loggers support 5 sensor placement locations (right) and installed in drip irrigated onion bed at ADI collaborator # 5's farm (left).

Below: Sub-surface irrigation- Diagram of fall onions planted in October 2006 by ADI collaborator #05; raised beds with 7/8"diameter, single drip tape located bed center 2" below surface. Soil moisture sensors placed bed center (6", 12", and 24" depths) and edge of bed (6" and 12" depths).



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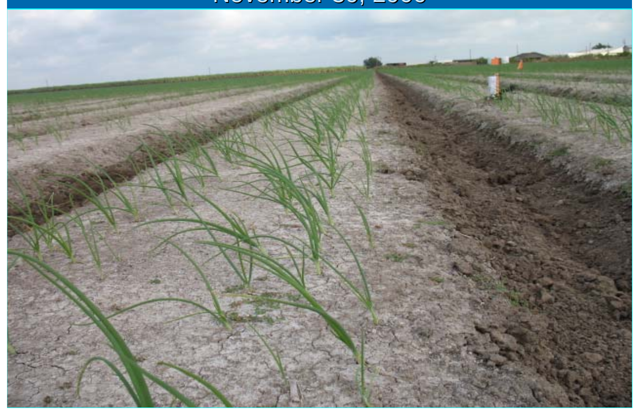
ADI Collaborator #05, Willacy County:

Pictorial time-line of onion growth under drip irrigation with Collaborator #5 in Willacy County near Raymondville. White onions planted October 1, 2006 on drip irrigation on a 60” bed, 6 rows, with a center single drip line two inches underground.

Collaborator #5, Willacy County
November 3, 2006

Collaborator #5, Willacy County
November 30, 2006



Collaborator #5, Willacy County
Harvest, March 13, 2007

Collaborator #5, Willacy County
January 10, 2007

Collaborator #02, Hidalgo County:

This particular site has drip, microjet and narrow bordered flood irrigation in close proximity. Agreements to install metering devices should be completed by late March 2007.

Above: Mr. Danny Allen with Harlingen Irrigation District surveys connection line for a 10” metering device.

Below: Neta-fim sprinkler on site #02, microjet location and raised bordered flood both on Rio Red grapefruit fields.

New Signs throughout the Lower Rio Grande Valley:

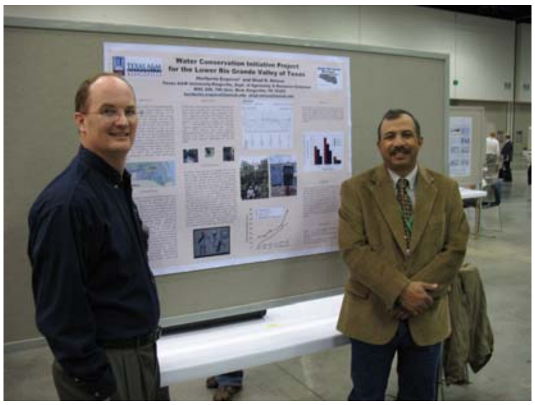
Above: New signs are installed at different sites to signify cooperation with ADI program in LRGV; collaborator #028 (left) and collaborator #02 (right).

Equipment installation on ADI Collaborator Sites:

Below: WatchDog data logger and WaterMark soil moisture sensor installation next to Decagon ECH_20 soil water monitoring equipment on Collaborator #01's farm to help facilitate soil moisture readings for farmer.

ASA-CSSA-SSSA 2006 International Annual Meeting, Indianapolis, Indiana:

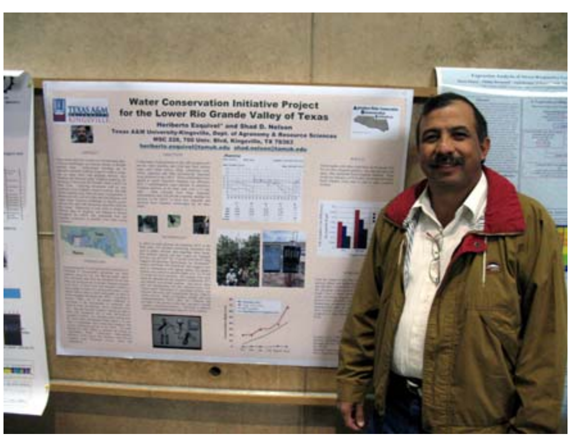
As members of the American Society of Agronomy/ Crop Science Society of America/ and Soil Science Society of America, Dr. Shad Nelson and Heriberto (Eddie) Esquivel presented a poster on Water Conservation Initiative Project for the Lower Rio Grande Valley of Texas representing activities involving ADI project.

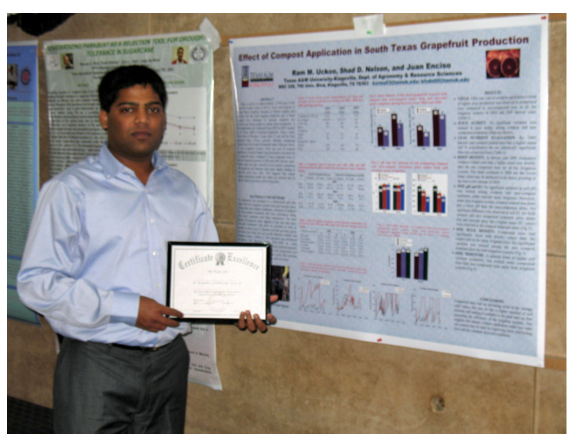


Above: Authors, Dr. Shad Nelson and H. Esquivel pose proudly next to poster in Indianapolis.

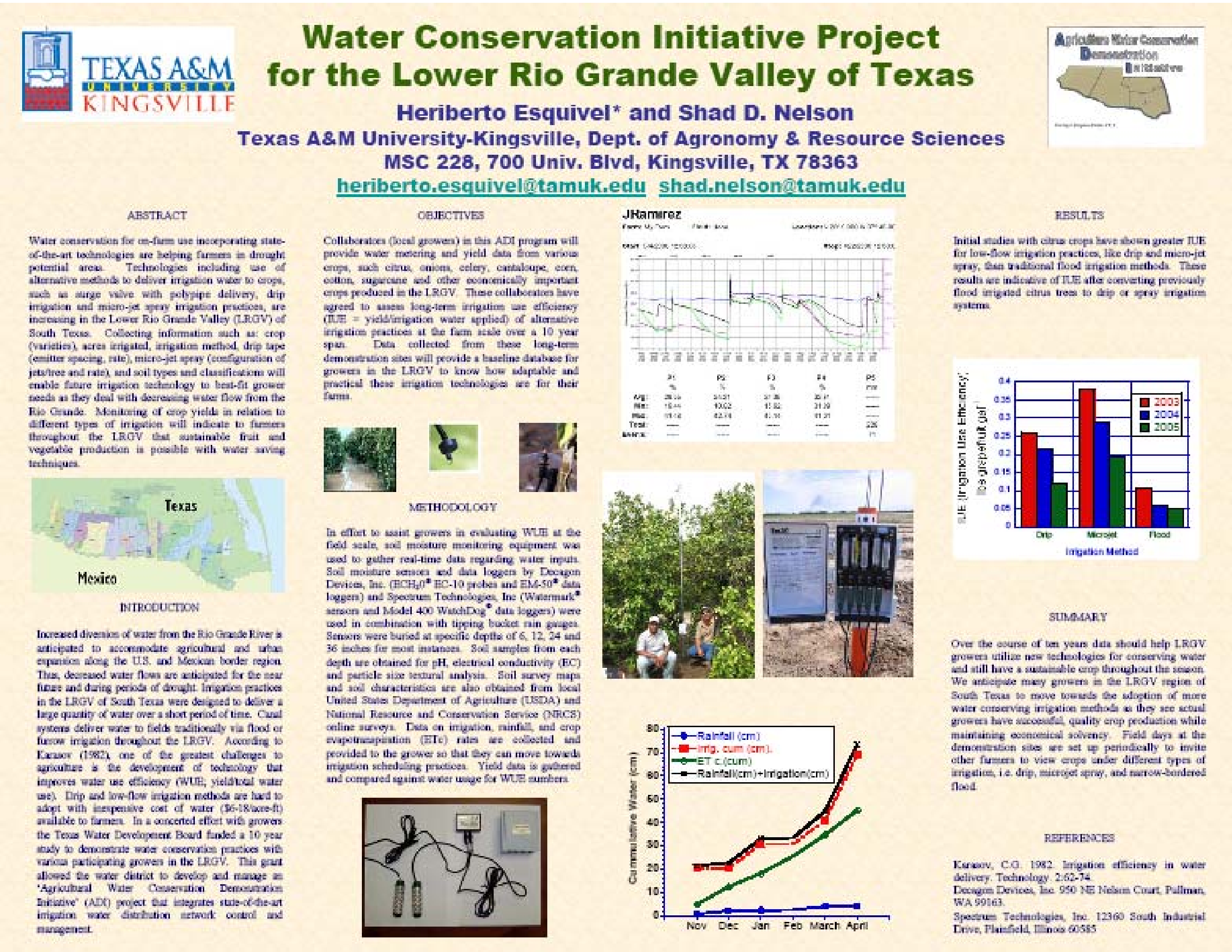
2007 61st Annual Rio Grande Valley Horticultural Society Meeting, Edinburg, TX:

Below: H. Esquivel presents his poster, Water Conservation Initiative Project for the Lower Rio Grande Valley of Texas and Rammohon Uckoo stands by his 1st place poster titled-Effect of Compost Application in South Texas Grapefruit Production, utilizing drip and microjet irrigation as water conservation techniques. Research was completed on ADI collaborator site #06 and funded by Rio Grande Basin Initiative. Ram is currently attending Texas A&M University working on his Ph.D.

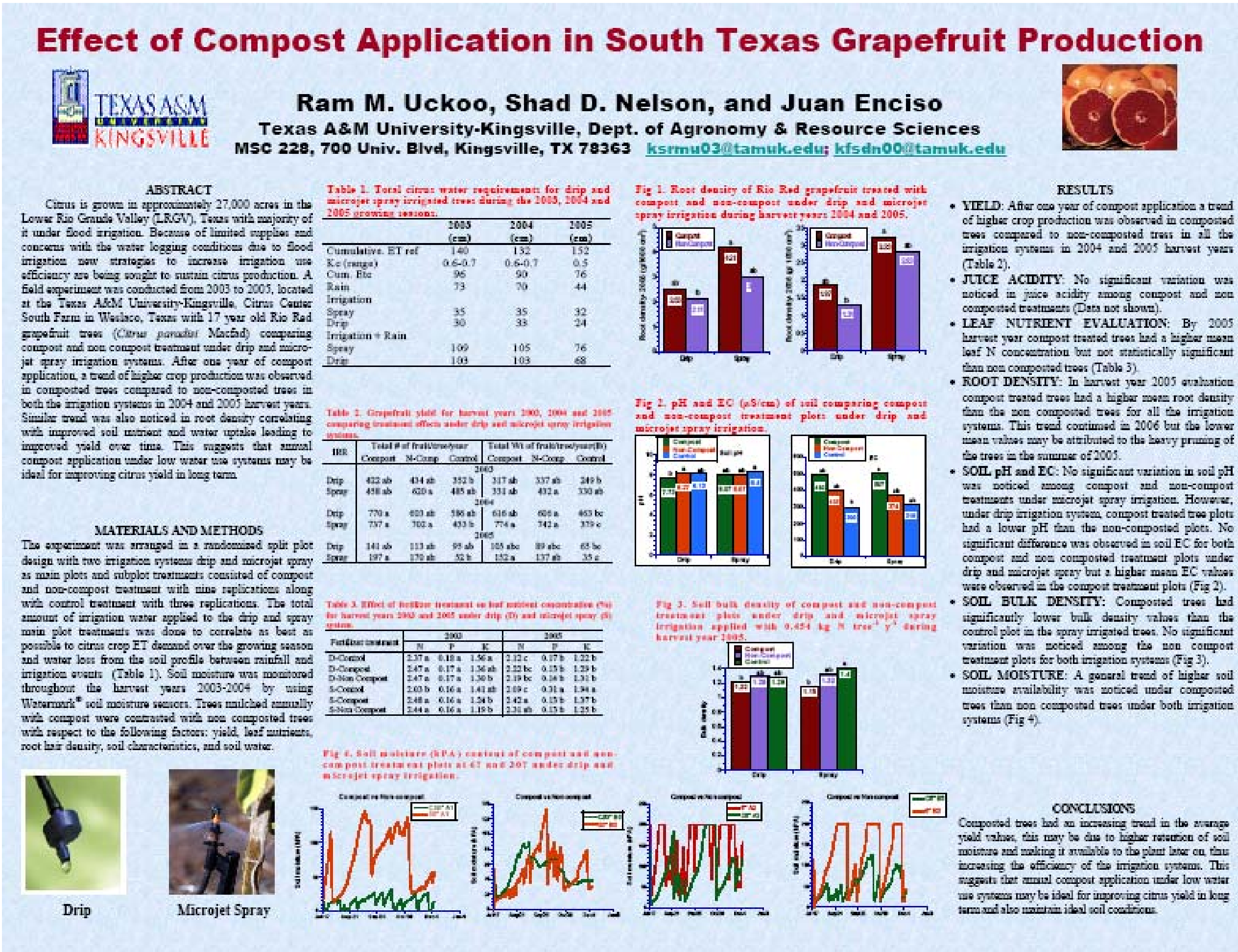




H. Esquivel's ADI poster, presented at the ASA-CSSA-SSSA 2006 International Annual Meeting, Indianapolis, Indiana:



Rammohan Uckoo's 1st Place poster at Rio Grande Valley Horticultural Society Meeting at Edinburg, TX:



Rainfall Totals for East/West Ends of Lower Rio Grande Valley 2005-2006:

Average annual rainfall within the LRGV is approximately 25 inches. This past 2005 year the Valley experience below average rainfall. Below is an example of rainfall for two ends of the LRGV.

Monthly Rain Totals for McAllen

Totals 2006	inch	cumulative	Totals 2005	inch	cumulative
Jan	0.08	0.08	Jan	1.02	1.02
Feb	0.13	0.21	Feb	0.96	1.98
Mar	0.55	0.76	Mar	0.4	2.38
April	0.01	0.77	April	0.02	2.4
May	0.73	1.5	May	1.78	4.18
June	0.35	1.85	June	0.5	4.68
July	3.4	5.25	July	7.37	12.05
Aug	0.76	6.01	Aug	1.85	13.9
Sept	11.22	17.23	Sept	1.08	14.98
Oct	1.73	18.96	Oct	1.34	16.32
Nov	0.1	19.06	Nov	0.4	16.72
Dec	2.73	21.79	Dec	0.48	17.2
	21.79	Total 2006 year		17.2	Total 2005 year

Monthly Rain Totals for Harlingen

Totals 2005	inch	cumulative	Totals 2006	inch	cumulative
Jan	0.34	0.34	Jan	0.24	0.24
Feb	1.07	1.41	Feb	0.06	0.3
Mar	0.21	1.62	Mar	2.03	2.33
April	0.18	1.8	April	0.04	2.37
May	1.75	3.55	May	3.16	5.53
June	0.14	3.69	June	0.46	5.99
July	4.08	7.77	July	2.41	8.4
Aug	0.32	8.09	Aug	2.04	10.44
Sept	2.77	10.86	Sept	4.88	15.32
Oct	2.37	13.23	Oct	3.88	19.2
Nov	1.47	14.7	Nov	0.34	19.54
Dec	0.92	15.62	Dec	3.22	22.76
	15.62	Total 2005 year		22.76	Total 2006 year

Harvest Yields and Irrigation Totals:

This year we used on-site information of 2005-2006 harvest years (chart below), with two of the collaborator sites; site #01a (narrow bordered flood w/ polypipe) and site #028c (microjet). These two demonstration sites are relatively close (approximately 20 miles) to each other, rainfall amounts and soil properties are also similar.
IUE (irrigation use efficiency) and WUE (water use efficiency) numbers using pounds per acre inch, per tree comparing narrow bordered flood verses microjet irrigation, indicated better efficiencies with microjet irrigation. Total irrigation and rain in gallons per acre were significantly lower with microjet irrigation.
Due to scheduling differences between annual reports and citrus harvest events, for 2007 have not been received for this annual report.

Citrus Harvest Years 2005-2006: Rio Red Grapefruit

Assuming 27,000 citrus acres in LRGV under Microjet

Saved: Microjet vs Flood	Total Acreage LRGV	
gallons/ac	gallons	ac/ft
1.118E+06	3.018E+10	9.261E+04

Collaborator: #01
Block #106-107, Rio Red Grapefruit
73 acres Narrow Bordered Flood (Polypipe)

IUE (yield/irr)	WUE (yield/(irr+rain))	IUE (yield/tree)	WUE (yield/tree(irr+rain))	Total Irr+Rain
[lbs/ac.in]	[lbs/ac.in]	[lbs/in-tree]	[lbs/in-tree]	[gallons/acre]
1029.83	696.20	8.96	6.05	1.395E+06

Collaborator: #28
Block #74, Rio Red Grapefruit
8 acres Microjet irrigation

IUE (yield/irr)	WUE (yield/(irr+rain))	IUE (yield/tree)	WUE (yield/tree(irr+rain))	Total Irr+Rain
[lbs/ac.in]	[lbs/ac.in]	[lbs/in-tree]	[lbs/in-tree]	[gallons/acre]
1882.72	972.89	16.23	8.39	2.770E+05

ADI Collaborator #021 Cotton Harvest 2006, Stress Irrigation vs. Conventional Irrigation:

Difference: Stress vs. Conventional Irrigation	Acreage	Irrig-Total (Gal/acre)	Yield-Total (lbs/ac)	Irrig-Total ac. In./ac	IUE (yield/irr) [lbs/ac.in]	WUE (yield/(irr+rain)) [lbs/ac.in]	
317,332	3	977,553	571.00	126	31.72	19.16	Stress Irrig.
Gallons of water saved per acre	183.1	59,663,318	820.00	219,728	37.27	24.6	Conv. Irrig.

Above: On sandy loam soil, two sites, 3.5 acres (stress irrigation) and 100 acres (conventional irrigation) was studied during 2006. Both sites were planted in February and harvested in July of 2006 at 52,000 plants per acre on 40 inch beds. Furrow irrigation with polypipe was utilized on both sites. Irrigation Use Efficiency (IUE) and Water Use Efficiency (WUE) numbers were lower on the stress irrigated plots although the total yield was 30% higher with conventional irrigation water amounts.

Below: Information on Musk Melon, *var*. Honey Brews, in Hidalgo County. No comparison values available at this time.

	Collaborator #22, Hildalgo County, Musk Melon (Honey Brews)					
Acreage	Acre Foot per Acre	Irrig-Total (Gal/Acre)	Irrig-Total (ac.in/ac)	Yield-Total (lbs./ac)	IUE (yield/irr) (lbs/ac.in)	WUE (yd/(irr+rain)) (lbs/ac.in)
3	0.83	269,293	269,262	39,000	3,933	3,477

Planting and soil characteristics below on Musk Melon crop:

Crop Characteristics	Soil Characteristics	6" sensor	12" sensor	18" sensor	Irrigation Type
		Watermark sensors			
Planted on 02/13/06	Sand %	37.76	36.76	31.76	Sub-surface Drip
Harvested from	Silt %	45.72	48.72	53.72	
05/10 to 05/30/06	Clay %	16.52	14.52	14.52	
80-inch beds	Soil Type	Loam	Loam	Silt Loam	
	LaGloria S. Lm. (90%) & Rio Grande S. Lm. (10%)				
	BD (g/cm3)	1.10	1.33	1.18	
	FC	28.4	27.0	28.8	
	PWP	12.1	11.0	11.0	
	PAW (FC-PWP)	16.3	16.0	17.8	

ADI Collaborator's Onion Sites of the LRGV- Sub Surface Drip:

Acreage	Acre Foot per Acre	Irrig-Total (Gal)	Irrig-Total (ac.in/ac)	Yield-Total (lbs./ac)	IUE (yield/irr) (lbs/ac.in)	WUE (yd/(irr+rain)) (lbs/ac.in)
Collaborator #025a, Starr County, Yellow Onions						
56.0	2.0	36,081,481.2	23.7	37,000.0	1,559.3	1,239.6
Collaborator #026a, Hidalgo County, Yellow Onions						
15.7	1.3	6,464,883.8	15.6	48,336.0	3,187.4	2,900.5
Collaborator #01e, Hidalgo County, Yellow Onions						
52.0	1.1	18,937,743.2	13.4	32,000.0	2,386.0	1,099.2

Examples of Soil Characteristics, Sensor Placement and Planting Information of ADI Collaborators:

Soil Information for Collaborator #025:

Soil Characteristics	6" sensor	12" sensor	18" sensor	Irrig Type/ Information
	Watermark sensors			
Sand %	17.12	17.12	12.40	Sub-surface Drip
Silt %	42.72	42.72	45.44	Planted on 10/11/05
Clay %	40.16	40.16	42.16	Harvested on 04/15/06
Soil Type	Silty Clay	Silty Clay	Silty Clay	80-inch beds
LaGloria S. Lm. (78%), Rio Grande S. Lm. (17%) & Camargo Silty C. Lm. (5%)				
BD (g/cm3)	1.01	1.25	1.46	
FC	38.9	38.9	39.9	
PWP	24.3	24.3	25.2	
PAW (FC-PWP)	14.6	14.6	14.7	

Soil Information for Collaborator #026:

Soil Characteristics	6" sensor	12" sensor	18" sensor	Irrig Type/ Information
	Watermark sensors			
Sand %	61.12	61.12	56.40	Sub-surface Drip
Silt %	22.72	20.72	19.44	
Clay %	16.16	18.16	24.16	
Soil Type	Sandy Lm.	Sandy Lm.	Sandy C. Lm.	
Brennan Fine Sandy Lm. (85%), Rio C. Lm. (12%) & Hidalgo Sandy C. Lm. (3%)				
BD (g/cm3)	1.39	1.53	1.66	
FC	21.8	22.8	26.9	Planted on 10/13/05
PWP	11.5	12.6	16.0	Harvested on 03/21/06
PAW (FC-PWP)	10.3	10.2	10.9	40-inch beds

Soil Information for Collaborator #01:

Soil Characteristics	6" sensor	12" sensor	24" sensor	36" sensor	Irrig Type/Information
pH	7.7	7.6	7.7	7.8	Drip
EC (dS/m)	1.02	1.24	5.17	4.58	80 inch center-to-center beds
Sand %	33.12	35.12	47.12	34.24	1 drip tape/bed
Silt %	38	36	33.28	41.6	tape buried 6 to 8 inches
Clay %	28.88	28.88	19.6	24.16	18 inch emitter spacing
Soil Type (PSA)	Clay loam	Clay loam	Loam	Loam	0.4 gal/hr rate
BD (g/cm3)	n/a	n/a	n/a	n/a	6 rows onions / bed
FC	36	36	27	27	
PWP	23	23	13.4	13.4	
PAW (FC-PWP)	13	13	13.6	13.6	

ADI exposure to media and other external groups (not using ADI funds):

Dr. Shad Nelson was interviewed on Channel 6- Morning Show, of Corpus Christi, TX on the goals and importance of water saving techniques used in irrigation of the Rio Grande Valley.

Traveled to Indianapolis, Indiana on November 12, to present poster on Agricultural Demonstration Initiative project at the International ASA-CSSA-SSSA Annual Conference.

Eddie Esquivel presented ADI poster (non-competition) at the University of Texas at Pan-Am in Edinburg, TX for the 61st Annual Rio Grande Valley Horticultural Society meeting. Water Conservation Initiative Project for the Lower Rio Grande Valley of Texas.

Rammohon Uckoo, Ph.D. candidate, TAMU, won first place in poster competition with his poster on Effect of Compost Application in South Texas Grapefruit Production. The 61st Annual Rio Grande Valley Horticultural Society meeting.

Uckoo, R.M., S.D. Nelson, K.J. Shantidas, and J.M. Enciso. 2005 (published Oct 2006). Irrigation and fertilizer efficiency in South Texas grapefruit production. Subtropical Plant Science. Journal of the Rio Grande Valley Horticultural Society. 57:23-28. This is a publication originating from a water conservation project located at South Farm in Weslaco, TX comparing flood, drip and microjet spray on Rio Red grapefruit.

Total Funds Spent on ADI Project from Feb. ’05 to May ‘07:

Total funds spent on ADI project (Feb 2005-May 2007)	**ADI Funds**		**TAMUK Funds**
Wages	$92,406.46		$74,254.36
Supplies/Equipment	$21,718.38		$25,060.94
Travel Expenses	$6,002.18		$19,770.77
Total	**$120,127.02**		**$119,086.07**
This list does not include any funds donated by TAES- Dr. Juan Enciso such as labor, gas, supplies, travel, etc.			

Budgetary Expenditures during Years 1 & 2 of ADI project for TAMUK:

TAMUK Sub-contract Budget	Year 1 2/15/05-2/14/06	Amendment # 1 2005	Year 1 2/15/05-2/14/06	Amendment # 2 2/15/06	Years 1&2 2/15/05-5/31/07	Years 1&2 2/15/05-5/31/07
	Total Original Amount	Total Amount Decrease	Total Adjusted Amount	Total Amount Increase	Total Adjusted Amount	Total Amount Spent
Salary & Fringe	51,214.00	0	51,214.00	52,547.00	103,761.00	90,398.50
Travel	6,000.00	0	6,000.00	0	6,000.00	6000.00
Operational Supplies	22,750.00	-10,007.00	12,743.00	0	12,743.00	11,672.14
Total	79,964.00		69,957		122,504.00	102,070.64

Additional Matching Funds brought to ADI Projects during Year 2:

Other grant funds:

$16,500. Rio Grande Basin Initiative, Task 4: “On-Farm Irrigation System Management”. Money pays for one ADI demonstration site and labor associated with this demonstration site located in Weslaco, TX.

Other donated sources:

Salaries for Xavier Périès, Juan Ramirez and Dr. Juan Enciso at Texas Agricultural Experiment Station, Weslaco, TX. These people are currently collecting data for this project without monetary reimbursement. Dollar amount unknown, but substantial.
Dr. Kim Jones and Irama Wesselman from the Dept. of Environmental Engineering at TAMUK contributed their paid time to consult and analyze soil moisture data.

$5,340. Mileage for Department of Agronomy & Resource Science truck donated and paid by departmental annual budget. With approximately 30 trips to the Lower Rio Grande Valley per year and approximately 400 miles per trip visiting ADI collaborators, this equates to approximately 12,0,000 miles driven during project Year 2 from Feb 2006 to Feb 2007. At 44.5 cents/mile this equals $5,340.00 in gas and maintenance associated with the truck that is not assessed against the ADI budget.

Current Assessment Questions for ADI projects under TAMUK:

How is the data being collected and how is it being stored?
Data from soil moisture sensing equipment and rain gauges at the afore-mentioned sites are being handled by Dr. Nelson's group (Ram Uckoo, Eddie Esquivel) and Dr. Enciso's staff (Xavier Peires) working on this project: and. Dr. Nelson's group handles 6 locations, while Dr. Enciso's group handles 8 locations. The data is collected in the field, stored temporarily on a laptop computer or Personal Digital Assistant (PDA), and then transferred to another computer at the research station/lab in Kingsville or Weslaco.

How will the data be made available to other growers?
Data downloaded will be delivered to Harlingen Irrigation District and Tom McLemore to make the data available on the hidcc1.org website, where soil moisture monitoring and rainfall data will be collected for growers to see.
ADI Collaborators will provide us with harvest, fertility, and input data respective to their ADI demonstration site. This information will be made available on the hidcc1.org website.

What are the ultimate goals of data collection?
We anticipate correlating water use from various irrigation systems with current irrigation practices used by growers. Initially soil moisture monitoring with evaluate where and to what depth water is moving within the soil profile. Also, correlate ET demand and crop water use (where in the rooting zone is water being taken), so that in the near future we can grasp better how much of the soil profile needs to be recharged during each irrigation cycle under drip, microjet, furrow, and flood irrigation practices. This work will be examined in relationship to soil type and location within the Lower Rio Grande Valley (LRGV).

What is the plan for 2007?
Install water meters by late March, on Sharyland Orchards to utilize three different types of irrigation on one site; microjet, drip, and narrow bordered flood.
Collect basic bulk density figures for each collaborator cropping site for evaluation of water percolation.
Continue relationship with established collaborators and install purchased soil moisture monitoring equipment, rain gauges and most importantly focus on accurate water metering (supplying meters to collaborators, if needed).
Monitor soil quality parameters under low-water use irrigation systems over time. Such as, evaluation of soil salinity increases under drip or microjet irrigation vs. flood in the Lower Rio Grande Valley.
Establish the baseline irrigation needs for growers involved in demonstration sites, and evaluate water and irrigation use efficiency from these locations.

Increase Heriberto Esquivel to TAMUK ADI Project Manager to oversee graduate and undergraduate student laborers involved in project data collection and managing data collection with ADI collaborators/growers.