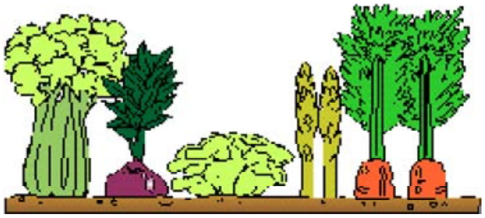

VEGETARIAN NEWSLETTER

A Vegetable Crops Extension Publication
Vegetarian 02-10
October 2002

University of Florida
Institute of Food and Agricultural Sciences
Cooperative Extension Service

Vegetarian Archive Vegetarian Index

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COMMERCIAL VEGETABLES

List of Extension Vegetable Crops Specialists

* * * * * * * UPCOMING EVENTS CALENDAR * * * * * * *

Suwannee Valley Field and Greenhouse Workshops. NFREC-Live Oak. Thursday, November 7, 2002, 8:30-3:00.

Florida Drip Irrigation School. GCREC-Dover. November 13, 10:00-4:00. Contact Christine at 813-744-6630. Programs are offered free of charge but require pre-registration.

Florida Drip Irrigation School. NFREC-Live Oak. December 4, 9:00-4:00. Contact Laurie at 386-362-1725. Programs are offered free of charge but require pre-registration.

Cucurbitaceae 2002. Naples Beach Hotel and Golf Club; Naples, Fla. December 8-12. Contact Don Maynard at 941-751-7636 x239 or dnma@mail.ifas.ufl.edu

Florida Postharvest Horticulture Industry Tour. Statewide. March 10-13, 2003. Contact Steve Sargent at 352-392-1928 or sasa@mail.ifas.ufl.edu OR Mark Ritenour at 561-201-5548 or mrit@mail.ifas.ufl.edu

Florida Postharvest Horticulture Institute at FACTS (Florida Agricultural Conference & Trade Show). Lakeland. April 29-30, 2003. Contact Steve Sargent at 352-392-1928 or sasa@mail.ifas.ufl.edu

116th Florida State Horticultural Society. Sheraton World Resort Hotel International Drive - Orlando, June 8-10, 2003.

WATERMELON VARIETY EVALUATION AT GCREC-BRADENTON, SPRING 2002

Diploid (seeded) watermelons generally weigh from 18 to 35 lb and represent at least half of the commercial crop grown in Florida. Icebox watermelons weigh 6 to 12 lb each and are grown on a very small acreage. Triploid (seedless) watermelons usually weigh 15 to 22 lb and are grown in Florida on perhaps 40% of the acreage. The proportion of the Florida crop devoted to triploid production is increasing each year. Florida produced 8.6 million cwt of watermelons of all types from 24,000 harvested acres in 2000-2001, which provided an average yield of 310 cwt/acre. The average price was $5.70/cwt resulting in a crop value of over $42 million which accounted for 2.5% of the gross value of the state's vegetable crops.

The concept of triploid (seedless) watermelons was first described in the U.S. based on experimentation that began in 1939 in Japan. Seed for planting seedless watermelons results from a cross between a tetraploid female parent, developed by treating diploid lines with colchicine or by other means, and a diploid (normal) male parent. The resulting triploid plants are sterile and do not produce viable seed. However, small, rudimentary seeds develop which are eaten along with the flesh just as immature seeds are eaten in cucumber.

Fruit enlargement in seeded fruit, including watermelon, is enhanced by growth-promoting hormones produced by the developing seed. Growth hormones are lacking in seedless watermelons so those agents must be provided by pollen. Since flowers of triploid plants lack sufficient viable pollen to induce normal fruit set, diploid seeded watermelons are interplanted with triploids to serve as pollenizers. An adequate bee population is necessary to insure that sufficient transfer of pollen occurs. Seedless fruit (from triploid plants) tend to be triangular shaped without sufficient pollination.

Although the procedure for production of seedless watermelons has been known for about 50 years and commercial varieties have been available for many years, the interest in and acreage of seedless watermelons has remained small in Florida until recently. Erratic performance, poor seed germination, high seed costs, and inadequate varieties resulted in lack of interest in seedless watermelon production in the past, but most of the deterents have now been overcome.

The objective of these trials was to evaluate the performance of diploid and triploid watermelon varieties under west-central Florida conditions.

The EauGallie fine sand was prepared in late January by incorporation of 0-0.8-0 lb N-P_2O_5-K_2O per 100 linear bed feet (lbf). Beds were formed and fumigated with methylbromide:chloropicrin, 67:33 at 2.3 lb/100 lbf. Banded fertilizer was applied in shallow grooves on the bed shoulders at 3.1-0-4.3 lb N-P_2O_5-K_2O/100 lbf after the beds were pressed and before the black polyethylene mulch was applied. The total fertilizer applied was equivalent to 150-40-208 lb N-P_2O_5-K_2O/A. The final beds were 32-in. wide and 8-in. high, and were spaced on 9-ft centers with four beds between seepage irrigation/drainage ditches, which were on 41-ft centers.

Diploid entries were direct seeded on 20 February and triploid entries were transplanted on 1 March at 3-ft in-row spacing. Eight-plant triploid plots were arranged on two beds with ten-plant diploid plots in beds on each side. Diploids were replicated four times and triploids three times.

Watermelons were harvested twice during the 17-23 May and 30 May - 5 June periods. Marketable (U.S. No.1 or better) fruit according to U.S. Standards for Grades of Watermelons were separated from culls and counted and weighed individually. Fruit 12 lbs and larger were assumed to be marketable. Six fruit from each entry at each harvest were used to determine soluble solids (a measure of sweetness) with a digital, hand-held refractometer.

Total diploid yields (Table 1) varied from 535 cwt/acre for 'Gold Strike' to 925 cwt/acre for 'Rojo Grande'. Nineteen other entries had yields similar to those of 'Rojo Grande'. Average fruit weight over the entire season ranged from 18.2 lbs for 'Gold Strike' to 24.8 lbs for 'Dulce'. Fruit per plant varied from 1.9 for 'Gold Strike' and XWD 98210 to 2.8 for 'Rojo Grande'. Soluble solids, a measure of sweetness, concentrations ranged from 11.5% for 'Festival' to 13.6% for SWD 403. Seasonal average soluble solids for all entries exceeded the 10% specified for optional use to designate very good internal quality in the U.S. Standards for Grades of Watermelons.

Diploid watermelon variety evaluations have been conducted at this location each spring season since 1991. The highest yields ranged from 439 cwt/acre in 1996 to 1026 cwt/acre in 1993. In spring 2002, the highest yield was 925 cwt/acre which was considerably greater than the 11-year average yield of 777 cwt/acre.

Based on this and previous trials, the following 'Allsweet' and blocky 'Crimson Sweet' type varieties are expected to perform well in Florida: 'Jamboree', 'Mardi Gras', 'Regency', 'Royal Star', 'Royal Sweet', 'Sentinel', 'Starbrite' 'Stars-N-Stripes', and Summer Flavor 790, 800, and 900 series. 'Gold Strike' (for trial) should be evaluated for the niche orange-fleshed, seeded market. Other varieties may perform equally well on individual farms.

Total triploid yields (Table 2) ranged from 375 cwt/acre for 'Amarillo' to 1253 cwt/acre for HA 6033. Only one other entry produced yields significantly similar to those of HA 6033. Average fruit weight for the entire season varied from 14.8 lbs for ZG 8825 to 22.9 lbs SW 493. The number of fruit per plant ranged from 1.5 for 'Amarillo' to 3.6 for HA 6033. Soluble solids concentrations varied from 11.9% for

HSR 2402 to 13.9% for HA 6033. Accordingly, soluble solids in all entries far exceeded the 10% specified for optional use in the U.S. Standards for Grades of Watermelons to describe very good internal quality.

Seedless watermelon variety trials have been conducted at this location each spring season since 1988. The highest yields ranged from 507 cwt/acre in 1996 to 1253 cwt/A in 2002 which greatly exceeded the 871 cwt/acre average high during the entire 15-year period.

Based on results of this and previous trials, triploid hybrids, in alphabetical order, that should perform well in Florida include ‘Freedom’, ‘Genesis’, ‘Millionaire’, ‘Omega’ (for trial), ‘Revolution’, ‘Seedless Sangria’, ‘Sugar Shack’ (for trial), Super Seedless 7167, 7177, 7187 (for trial), ‘Summer Sweet 5244’, ‘Summer Sweet 5544’, ‘Tri-X 313’, ‘Tri-X Carousel’, ‘Tri-X Palomar’, and ‘Tri-X Shadow’. ‘Triton’, a yellow-flesh variety should be evaluated for that niche market. Other varieties may perform well on individual farms.

These reports in the entirety are available from the author as GCREC Research Reports. They are also available on the GCREC website (http://gcrec.ifas.ufl.edu)

Table 1. Total yields, average fruit weight, fruit per plant, percentage of cull fruit and soluble solids of diploid watermelons. Gulf Coast Research and Education Center, Bradenton, Spring 2002.

Entry	Seed Source	Total Harvest				
		Weight (cwt/A)[1]	Avg Fruit Wt(lb)	Fruit per Plant	Cull (%)[2]	Soluble Solids (%)
Rojo Grande	Willhite	925 a[3]	20.8 c-f	2.8 a	10 a	13.0 ab
RWM 8134	Syngenta	889 ab	24.7 ab	2.3 a-c	7 a	12.4 ab
Summer Flavor 800	Abbott & Cobb	887 ab	22.8 a-c	2.4 a-c	8 a	12.7 ab
Dulce	Willhite	882 ab	24.8 a	2.2 a-c	5 a	12.2 ab
HSR 2942	Hollar	868 ab	21.7 a-e	2.5 a-c	11 a	12.6 ab
SW 403	Southwestern	846 ab	19.9 c-f	2.6 ab	6 a	12.6 ab
SWD 7201	Sakata	838 ab	22.5 a-c	2.3 a-c	9 a	13.6 a
Jamboree	Syngenta	838 ab	21.7 a-e	2.4 a-c	4 a	11.9 b
RWM 8142	Syngenta	836 ab	24.4 ab	2.1 a-c	6 a	12.6 ab
RWM 8074	Syngenta	821 ab	22.4 a-d	2.3 a-c	8 a	12.2 ab
Sangria	Syngenta	788 a-c	21.5 b-e	2.4 a-c	11 a	12.9 ab
Piñata	Willhite	781 a-c	21.8 a-e	2.2 a-c	11 a	11.7 b
Olé	Willhite	769 a-c	22 a-d	2.2 a-c	7 a	12.9 ab
RWM 8133	Syngenta	762 a-c	20.1 c-f	2.4 a-c	6 a	12.2 ab
Summer Flavor 790	Abbott & Cobb	736 a-c	20.3 c-f	2.3 a-c	11 a	12.6 ab

98212	Sakata	736 a-c	23.0 a-c	2.0 bc	11 a	12.8 ab
HSR 2616	Hollar	733 a-c	20.7 c-f	2.3 a-c	13 a	13.0 ab
Mardi Gras	Syngenta	717 a-c	21.2 c-f	2.1 a-c	10 a	12.1 b
Montreal	Sunseeds	709 a-c	19.3 d-f	2.3 a-c	8 a	12.3 ab
Festival	Willhite	697 a-c	22.0 a-d	2.0 bc	8 a	11.5 b
Celebration	Syngenta	623 bc	18.6 ef	2.2 a-c	11 a	11.6 b
Gold Strike	Willhite	535 c	18.2 f	1.9 c	14 a	12.5 ab

[1]Acre = 4840 lbf.
[2]By weight.
[3]Mean separation in columns by Duncan's multiple range test, 5% level.

Table 2. Total yields, average fruit weight, fruit per plant, percentage of cull fruit and soluble solids of triploid watermelons. Gulf Coast Research and Education Center, Bradenton, Spring 2002.

Entry	Seed Source	Total Harvest				
		Weight (cwt/A)[1]	Avg. Fruit Wt (lb)	Fruit per Plant	Cull (%)[2]	Soluble Solids (%)
HA 6033	Hazera	1253 a[3]	22.6 a	3.6 a	8 f-h	13.9 a
SW 4930	Southwestern	1003 ab	22.9 a	3.1 a-d	2 h	12.7 a-f
XWT 8706	Sakata	970 bc	17.6 d-g	3.4 ab	12 e-h	13.3 a-e
HSR 2877	Hollar	954 b-d	17.5 d-h	3.4 a-c	10 e-h	13.5 a-c
11005031	Seminis	938 b-d	17.6 d-g	3.4 ab	15 d-h	12.2 d-f
Summer Sweet 5244	Abbott & Cobb	910 b-d	18.0 d-f	3.3 a-d	10 e-h	13.5 a-c
Super Seedless 7187	Abbott & Cobb	888 b-d	17.7 d-g	3.1 a-d	12 c-h	13.6 ab
Red Sunshine	U.S. Seedless	881 b-d	16.6 e-k	3.3 a-d	16 d-h	12.9 a-f
Trillion	Abbott & Cobb	870 b-d	16.9 e-j	3.2 a-d	12 e-h	12.7 b-f
Samba	Shamrock	856 b-e	21.6 ab	2.5 b-e	11 e-h	13.8 ab
HSR 2908	Hollar	833 b-f	15.5 h-k	3.3 a-c	18 c-h	13.4 a-d

ZG 8820	Zeraim Gedera	824 b-f	16.5 e-k	3.1 a-d	14 d-h	13.4 a-d
Omega	Seminis	808 b-f	19.1 cd	2.9 a-d	15 d-h	12.9 a-f
Super Seedless 7167	Abbott & Cobb	802 b-f	17.6 d-h	3.0 a-d	14 d-h	13.2 a-e
Super Seedless 7177	Abbott & Cobb	801 b-f	17.8 d-g	2.8 a-d	18 c-h	13.2 a-e
TRI-X Carousel	Syngenta	798 b-f	17.2 d-h	2.9 a-d	18 c-h	13.7 ab
Sweet Slice	Willhite	797 b-f	16.0 f-k	3.1 a-d	11 e-h	13.4 a-c
TRI-X 313	Syngenta	789 b-f	16.8 e-k	2.9 a-d	18 c-h	13.5 a-c
ZG 8805	Zeraim Gedera	782 b-f	17.2 d-h	2.8 a-d	12 c-h	13.6 ab
XWT 8707	Sakata	778 b-f	17.0 e-i	2.8 a-d	18 c-h	12.9 a-f
		Total Harvest				
Dillon	Hazera	774 b-f[3]	18.5 de	2.6 a-e	11 e-h	12.9 a-f
Gem Dandy	Willhite	771 b-f	16.9 e-j	2.9 a-d	17 c-h	13.0 a-f
Freedom	Sunseeds	761 b-f	19.2 cd	2.8 a-d	10 e-h	13.8 ab
Premiere	Southwestern	757 b-f	16.9 e-j	2.9 a-d	16 d-h	13.7 ab
Fandango	Shamrock	730 b-f	17.9 d-f	2.8 a-d	16 d-h	12.3 c-f
Seedless Sangria	Syngenta	727 b-f	20.6 bc	2.2 c-e	4 gh	12.2 ef
Revolution	Sunseeds	723 b-f	17.6 d-g	2.5 a-e	11 e-h	13.8 ab
HA 5015	Hazera	719 b-f	18.0 d-f	3.2 a-d	17 c-h	13.8 ab
TRI-X Palomar	Syngenta	716 b-f	16.4 f-k	2.8 a-d	17 d-h	13.2 a-e
Talladega	Sakata	707 b-f	17.2 d-h	3.3 a-d	9 f-h	13.0 a-f
RWT 8096	Syngenta	702 b-f	16.6 e-k	2.6 a-e	17 c-h	13.0 a-f
Genesis	Shamrock	695 b-f	15.7 g-k	3.0 a-d	15 d-h	12.7 a-f
SW 4625	Southwestern	679 c-f	16.0 f-k	2.6 a-e	19 c-g	12.7 b-f
HSR 2402	Hollar	668 c-g	16.0 f-k	2.7 a-d	26 b-e	11.9 f
Sugar Shack	Sugar Creek	665 c-g	17.0 e-i	2.6 a-e	16 d-h	13.2 a-e
Red Sweet	U.S. Seedless	664 c-g	17.8 d-f	2.3 b-e	13 e-h	12.9 a-f
Slice n' Serve	Southwestern	659 c-g	17.4 d-h	2.5 a-e	22 b-f	13.4 a-c

Sugar Time	Sugar Creek	650 d-g	17.4 d-h	2.3 b-e	30 b-d	13.8 ab
ZG 8828	Zeraim Gedera	546 e-g	15.1 i-k	2.3 b-e	32 bc	13.7 ab
Sugar Slice	Willhite	543 e-g	16.4 f-k	2.2 de	23 b-f	13.5 a-c
ZG 8825	Zeraim Gedera	519 fg	14.8 k	2.2 de	34 b	13.5 a-c
Amarillo	Syngenta	375 g	14.9 jk	1.5 e	51 a	12.6 b-f

[1]Acre = 4840 lbf.
[2]By weight.
[3]Mean separation in columns by Duncan's multiple range test, 5% level.

(Maynard- Vegetarian 02-10)

ALTERNATIVES FOR LOW COST SOIL MOISTURE DEVICES FOR TYPICAL SOILS AT THE SOUTH MIAMI-DADE AGRICULTURAL AREA

1. Irrigation management in South Florida: a pending issue

As human pressure increases (Miami-Dade is one of the top growing areas in the country) water is becoming a scarce resource. Although in general growers identify flooding as the number one threat to agriculture in the area, there have been water shortages in recent years. In spite of this, the high yields of the Biscayne shallow aquifer give the general perception among growers that water is not a limiting factor, but rather an endless one!

Over-irrigation, common in this area, can be explained as:

- Growers apply excess water to counteract the relatively low moisture retention of these soils.
- This practice has no downside since the high permeability of the soil and aquifer materials generally protect crops from excessive moisture conditions.

Over-irrigation has other effects, mainly environmental ones related to water quality. The excessive water applied washes down agri-chemicals present in the soil. This is especially critical in an area surrounded by National and State Parks or Reserves (Everglades NP, Biscayne NP, the Keys), and in view of the current Everglades Restoration effort. Water conservation has to be further developed in the area to increase the efficiency of agriculture while reducing its potential negative impacts.

Irrigation management (scheduling) can be done with different methods. An excellent one (by itself or combined with other scheduling practice) consists on keeping the soil within a target moisture range by replenishing the plant water use with irrigation.

For this purpose, soil moisture monitoring is needed. Classical soil monitoring devices (tensiometers, modified gypsum blocks) are available along with new soil ones (TDR, dielectric probes) that can become a useful tool. However, the rock-plowed soils present in the area are specially challenging, since its very coarse nature can pose contact problems for some of the available soil moisture devices. With this purpose an extensive soil monitoring program has been launched in Miami-Dade County.

2. Soils in South Miami-Dade

South Miami-Dade has three calcareous soil types (Krome, Chekika and Marl) with a wide range of physical conditions. Their main physical properties were determined at TREC-IFAS labs (see Table 1).

Table 1. Physical properties of soils found in Miami-Dade.

Property	Krome	Chekika	Marl
Porosity	45%	47%	65%
Bulk density, P_b	1.42	1.33	0.94

Coarse material (>2mm)	51%	46%	0%
Sand	36%	59%	5%
Silt	40%	30%	85%
Clay	24%	11%	10%
USDA texture	Gravelly-loam	Gravelly-loamy-sand	Silt
Hydraulic conductivity, K_s	317 cm/h	125 cm/h	9.15 cm/h

Krome has 51% coarse particles (gravel>2mm), Chekika 46%, while Marl has none. This together with the different texture of each soil translates in differences in water permeability, water holding capacity, wetting and drying speed, and ability to make good contact with some moisture devices.

The suction curves obtained for these soils (Fig. 1) shed light to their particular characteristics of relevance to crop irrigation in the area.

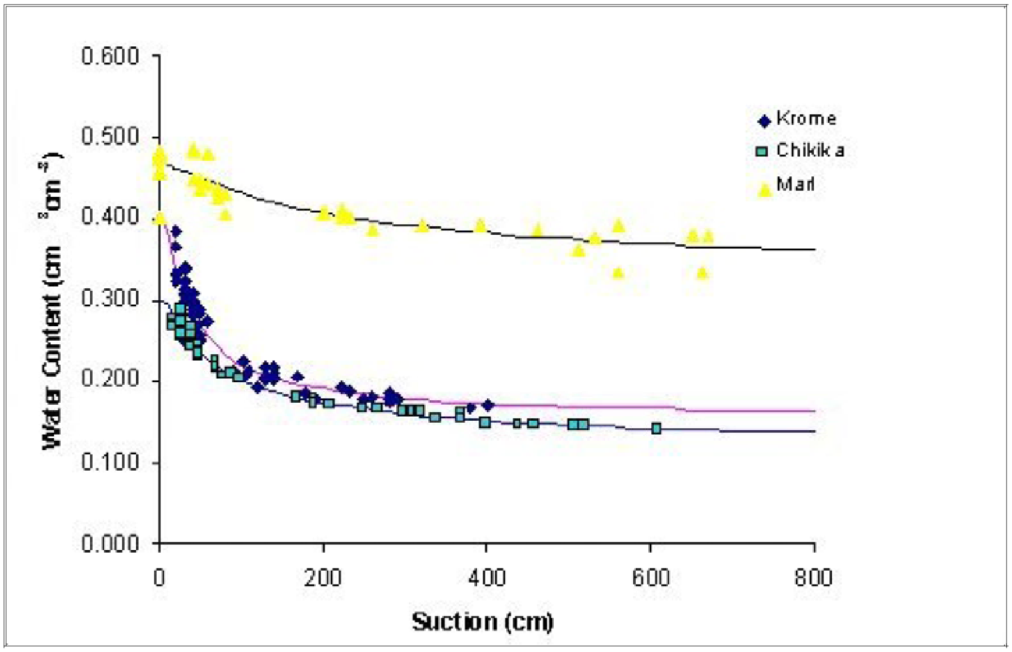

Fig. 1. Soil retention curves for each of the soils present in Miami-Dade agriculture.

Since Krome is made out of two distinct solid fractions (coarse gravel-51%, fine loam-49%), this soil exhibits a particular moisture retention pattern. Two soil moisture regions can be identified for Krome soil, each corresponding to one of these soil fractions (Fig.2).

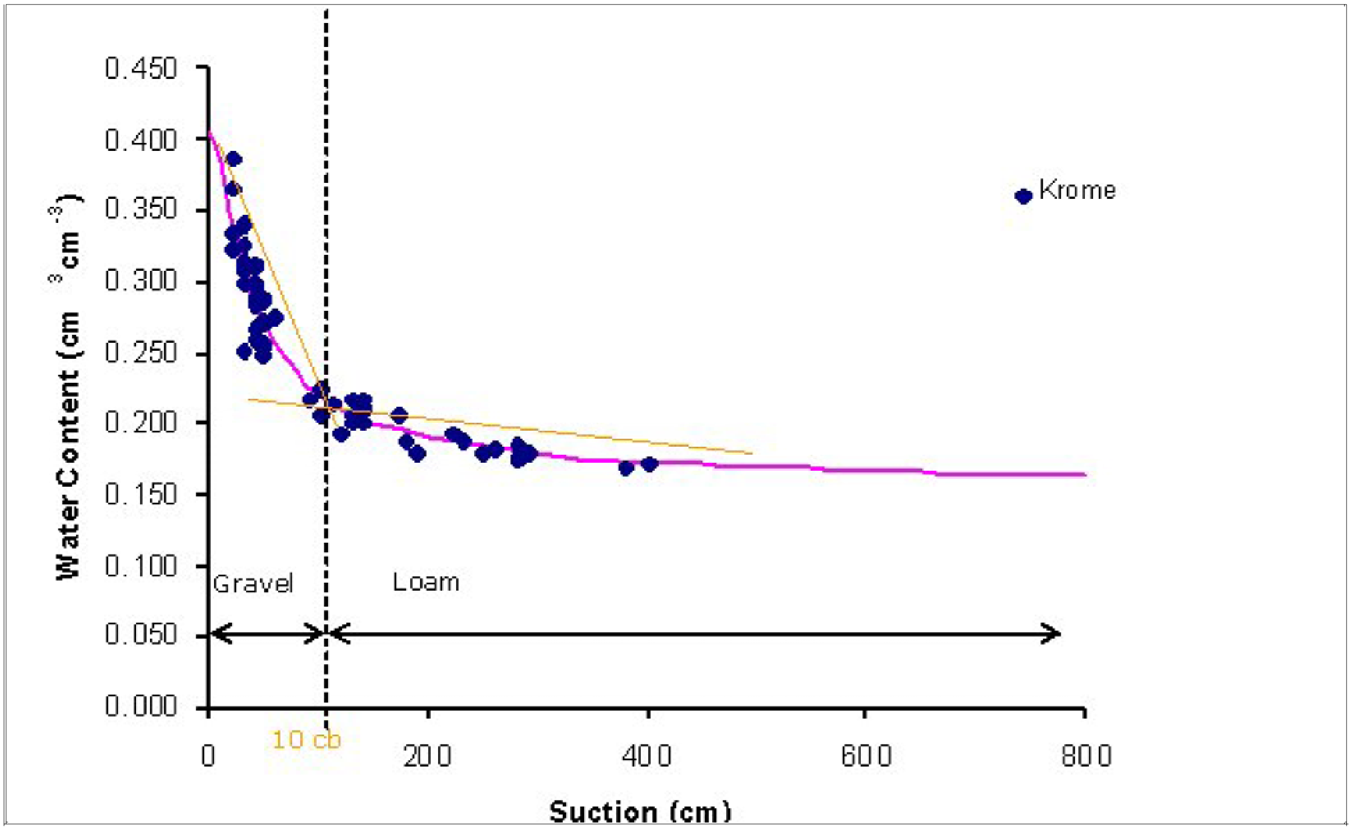

Fig. 2. Effect of the gravel and loam soil fractions on Krome soil moisture retention.

3. So, how do we measure moisture content in the soils?

Moisture content is usually measured based on one of two quantities: volumetric moisture content (K, cm^3 H_2O/cm^3 soil) and soil suction or matrix potential (h, cm). These two quantities are related by the suctions curves (Fig. 1 and Fig. 2). Is is important to remember that each soil type (texture/structure) has a different moisture curve, so the both quantities cannot be related to each other the same way for all soil types. The soil suction is a useful value since it relates to the energy that the plant has to invest to extract water.

There are several alternatives for monitoring soil moisture, each with its “pros” and “cons”. Issues involved are cost, accuracy, response time, preparation, installation, management, durability. Different technologies could prove advantageous in our range of calcareous soils, from the very permeable and coarse soils (Krome and Chekika) to the finer one (Marl).

Soil moisture can be measured directly by sampling soil with a core sampler, weighing and drying in a soil oven. However, this method is destructive, i.e. it is not possible to measure in the same point twice, and it does not yield instantaneous results to make irrigation decisions on site. As an alternative, different devices for use or installation in the field have been developed.

Four different soil moisture sensors were selected with a criterion of low cost (<$600) so that small growers in the area could have access to any of them if they proved successful. Among these, two new low cost devices were selected (TDR, dielectric probe) and compared to two classic alternatives (tensiometers and modified gypsum blocks) (Fig. 3).

The probes were first compared side to side for each soil type in the laboratory. Each soil was hand-packed in PVC cylinders (10 in. Ø x 8.5 in.) according to its bulk density (Table 1), and the four sensors inserted. Three replicates for each soil type (Krome, Chekika, and Marl) were evaluated. All readings are compared to true moisture measured by weight on a laboratory scale.

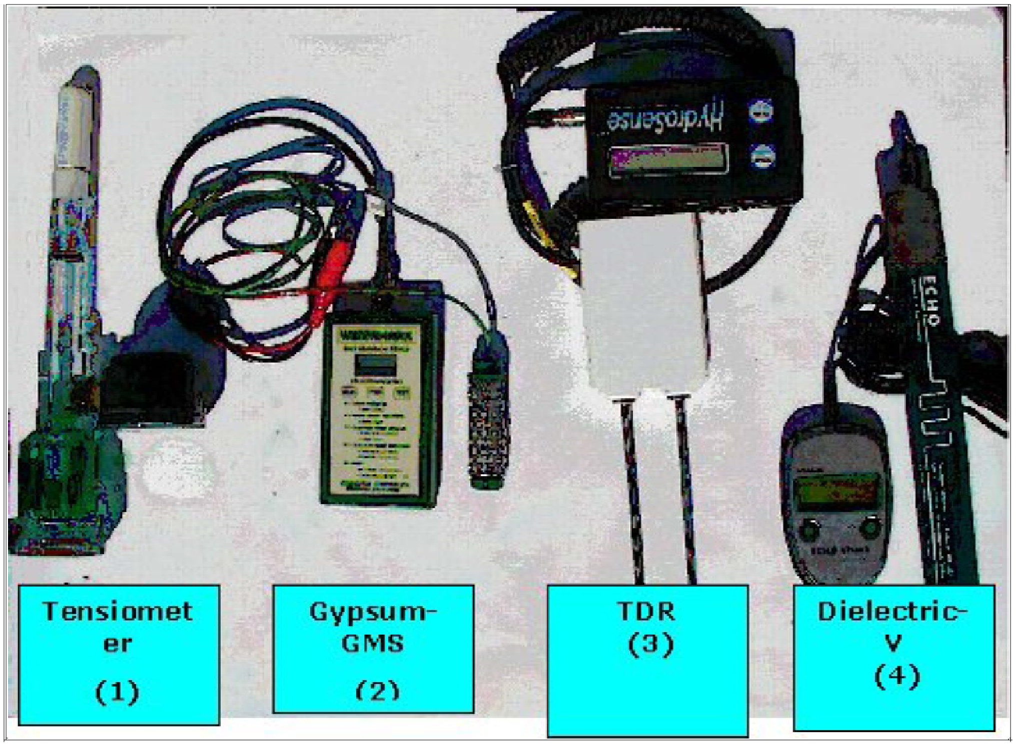

Fig. 3. Soil moisture devices studied in Miami-Dade agricultural soils.

Results for the K based devices showed that TDR can be used in all soil types with the standard calibration, where the dielectric probe needs a specific calibration for each of the soils. Among h-based devices, tensiometers lose soil contact and break the water column (i.e. requiring reinstallation) at different suction levels, 40 cb for Krome, 55 cbar for Chekika and highest for Marl (>60 cbar). This can represent a limitation for Krome and Chekika when the irrigation is not frequent (soil dries past the breaking point in between irrigations). The gypsum block showed a slow response at high suction levels (drier soil). This could be a limiting factor if the sensor is to be used as a switch off device. Calibration curves were obtained for the sensors (gypsum blocks, TDR and dielectric probes) for each of the soils studied. These calibrations are available for growers willing to apply any of them in the field.

After obtaining this information a field test was performed on a Krome soil. Sensors were compared in a tomato field (drip irrigation, plastic mulch) at UF-TREC (IFAS). The irrigation treatment was based on a set maximum soil suction (15 cbar). The four types of sensors were installed next to each other in the center of the tomato planting bed. Readings were taken daily at 8:30 and 5:00 pm. Irrigation (0.46 cm) was applied at 11:00 am each day when needed (tensiometer readings higher that 15 cbar). Irrigation stopped on March 30. Results are shown on Figure 4.

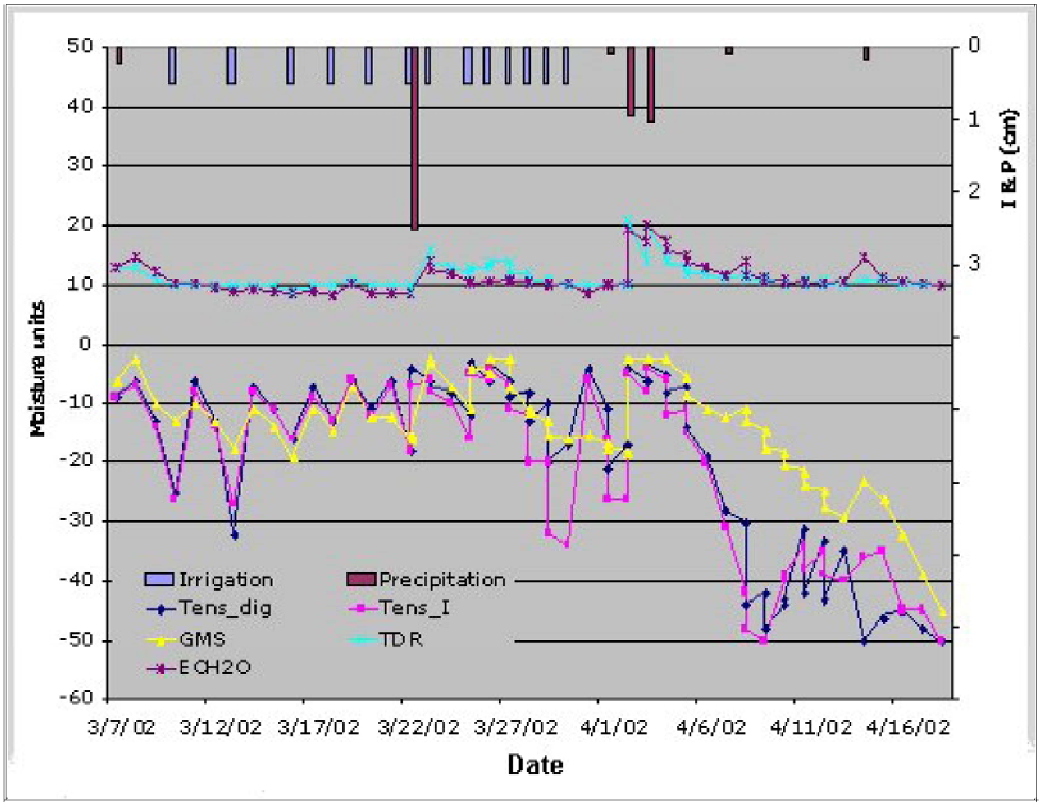

Fig. 4. Field comparison of the soil moisture devices in a rockplowed Krome soil.

Since up to March 30 plant water demands were supplied promptly, moisture dielectric devices (TDR and dielectric probe) remain relatively unchanged during the normal irrigation period, except when an unaccounted for excess water (rainfall) enters the soil. Both sensors give also rather consistent readings with the moisture regime

Suction devices capture not only rainfall but also irrigation, i.e. they are more sensitive in the field moisture range, 5-40cb. This is explained in terms of the moisture region explored. The sensitivity of the Krome moisture curve depends on the suction value (Fig. 2). For suction levels > 10 cbar the moisture content is relatively insensitive to suction changes. This is, large changes in suction translate into small changes in moisture content. This can be seem clearly in Figure 4, where the large changes in suction values for the tensiometer and gypsum blocks correspond to small changes in the TDR and dielectric probe readings.

4. Summary and Conclusions

A summary of evaluation criteria for the sensors studied is shown in Table 2. The disadvantages for each device are highlighted with a blue background. Although the response varied, all sensors gave consistent results for the soils found in South Miami-Dade. Laboratory calibration curves were obtained to correct sensor readings to real moisture or suction values for each soil type.

A field test in a vegetable field on Krome soil showed that if an irrigation set point around 15 cbar is chosen, the moisture-based devices are less sensitive due to the particular response of this soil.

Table 2. Summary of evaluation criteria for the soils sensors in Miami-Dade.

	Tensiometer	GMS	Dielectric	TDR
Reading	Direct- suction	Indirect- water	Indirect- water	Indirect- water
Cost	$70-$110	Block – $30	Sensor- $150	Sensor- $260 Reader- $325
Set-up	Involved	Minor	Minimal	Minimal
Maintenance	Yes–very important	No	No	No
Response	Fast	Slow for some applications	Instantaneous	Instantaneous
Calibration	No (only adjustment)	Yes	Yes	No (Yes)

(Rafael Muñoz-Carpena, asst. prof., Hydrology & Water Quality, TREC - Vegetarian 02-10)

ORGANIC PRODUCE - STILL SPECIALTY ITEMS?

Two major events are in the news this month regarding organic produce; the implementation of the USDA certified organic food label and the release of a publication on the dramatic rise in sales of organic food.

On October 21, 2002, the new USDA certified organic food label goes into effect, setting into motion a program that includes national standards and certification procedures from production through handling and distribution. According to the National Organic Program http://www.ams.usda.gov/nop/ the label law will accomplish the following. "After October 21, 2002, when you buy food labeled 'organic', you can be sure that it was produced using the highest organic production and handling standards in the world. Organic food is produced by farmers who emphasize the use of renewable resources and the conservation of soil and water to enhance environmental quality for future generations. Before a product can be labeled 'organic', a Government-approved certifier inspects the farm where the food is grown to make sure the farmer is following all the rules necessary to meet USDA organic standards. Companies that handle or process organic food before it gets to your local supermarket or restaurant must be certified, too."

This program will unify standards across the country as well as establish standards for imported foods from other countries. Use of the label is voluntary, but users must comply with the program standards.

Although more applicable to processed foods, the USDA has established three categories for organic food labeling, based on the amount of the ingredient that has been produced organically.

Organic Ingredients Content Label Name Permitted

1) 95 to 100% - 100% Organic
2) >70% - Organic
3) <70% - Specific ingredients can be listed on side panel of package

The name and address of the Government-approved certifier must also be printed on the labeled package.

The USDA-Economic Research Service published a timely report in September concerning the continued growth of the organic food sector. The results of several surveys and studies were compiled into the report, Recent Growth Patterns in the U.S. Organic Foods Market. (The reference is listed at the end of this article.) Some interesting facts follow.

The U.S. organic food industry has grown by 20% annually for the past several years. U.S. sales for all organic foods in the year 2000 was $7.8 billion. The year 2000 also represented a milestone in which, for the first time, the majority of organic foods were sold through retail supermarkets (49%), compared to those sold in health and natural products stores (48%) and via direct sales to consumers (3%). One of the studies reported that supermarket sales of organic, fresh produce was $94 million in 2001. Also, there are more than 800 community-supported agriculture programs (subscription" service from certified growers) functioning in the U.S., the majority using organic methods. And fresh fruits and vegetables accounted for most sales (about 42%) of all organic foods.

Organic Food Sales (2000):

1) Fresh fruits & Veg: $2.2 billion
2) Non-dairy beverages: $1 billion
3) Breads/grains: $700 million
4) Packaged foods: $600 million
5) Dairy Products: $500 million

The report also mentioned that the most often purchased produce items were: tomatoes, leafy vegetables, carrots, strawberries and apples. Fresh produce is considered the "gateway" category for introducing consumers to organic foods. Price premiums for organically grown produce were noted from data from the Boston wholesale market) for broccoli (30% increase) and carrot (25% increase).

Certified vegetable acreage (1997 data) revealed the dominance of the California organic industry:

- California: 23,000 ac
- Colorado: 3,700 ac
- Washington: 3,100 ac
- Arizona, Oregon, Minnesota, New York, Illinois, Florida: >1000 ac

Some 36 states had more than 49,000 certified fruit & nut acres (1997 data), namely

- California: 32,500 ac (2/3 of total)
- Arizona: 4,400 ac
- Washington: 3,000 ac

Principal commodities were grape (39%), apple (18%), citrus (12%) and tree nuts (10%). Most certainly organic acreage is much higher today.

Consumer surveys described the "typical" organic consumer as:

- having smaller household and higher income with female shoppers
- being more knowledgeable about alternative agriculture
- concerned about the environment
- concerned about food safety
- having children

Responses by consumers as to factors that affected purchase of organic produce were somewhat different for various studies, however price, size, packaging, blemishes and whether the item was on sale or not were noted. Another study reported that gender, age and having a college degree had little influence in the decision to purchase organic produce, while consumers with advanced degrees were less likely to purchase organic foods. Although one of the reasons for purchasing organic food was food safety, the USDA "makes no claims that organically produced food is safer or more nutritious than conventionally produced food. Organic food differs from conventionally produced food in the way it is grown, handled, and processed".

Most likely sales of organic produce will not continue to increase at the rapid rates seen the past few years. However, with continued consumer demand for more diverse and convenient produce items, organically grown produce will certainly play a significant part in the worldwide fresh-produce industry.

Reference:

Reference:

Recent Growth Patterns in the U.S. Organic Foods Market, by Carolyn Dimitri and Catherine Greene.US Dept. Agric. ERS Agriculture Information Bulletin No. AIB777. September 2002. http://www.ers.usda.gov/publications/aib777/ .

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