TEXAS A&M UNIVERSITY-KINGSVILLE

CITRUS CENTER

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January 2004 NEWSLETTER Vol.22 No.1

GREG PANZER
1951-2003

Early on the morning of December 25, 2003, our friend and colleague, Greg Panzer, passed away suddenly. Greg had been the computer specialist at the Center since 1975, and we were completely stunned by the news. The following tribute by John Fucik who knew Greg for many years is a fitting tribute to someone we will never forget.

John da Graca

For an additional article on Greg see Page 3

IN MEMORIUM

Greg Panzer began what eventually became his lifelong career at then Texas A&I University Citrus Center at the age of 16. He was employed as a part-time high school student working with me on a project exploring the effect of magnetic fields on the growth and physiology of sour orange seedlings. This was around 1967. The oldest son of Gloria and Ralph Panzer, our family's acquaintance with Greg's began principally via competitive swimming in which all the Panzer and Fucik children participated. Also the children all shared Sunday School experiences at Weslaco's Presbyterian church.

Through our initial encounters, I recognized in Greg a very inquisitive and open to learning spirit which seemed well suited to any experimental and research endeavors. When I received a small grant for the magnetic field study, Greg was eager to sign on. He not only picked up the thrust and details of the project, but showed considerable skills in the electrical and technical aspects of the project. He quickly was able to work independently and became a valued member of the "team". Most unusual traits for a teenager.

After high school and through much of his college years he continued to work at the Center part or full-time as his schedule allowed. He really came into his own when the Center acquired its first computer, a WANG. He set it up, learned its operation and quickly became the Center's computer expert. Following this Model "T" of computers, the Center went through the usual sequence of larger and more sophisticated computer systems including a large DEC housed in a special room, and on through the generations of PC's now in every office and even in a dedicated computer room. Through all these changes and installations, Greg, now a full-time employee of the Center became indispensable in understanding, setting up, operating, trouble shooting and guiding the staff and students through the complex and often frustrating maize of computer use and application, He also willingly shared his knowledge and experience with his fellow computer specialists at the A&M and U.S.D.A. experiment stations.

Through times of difficult and frustrating personal and family situations, Greg's reliability and devotion to his job and working with the Center staff to serve their computer needs never wavered. Dr. Jose Amador's suggestion to name the new computer room after Greg is most appropriate. Greg was a very special personality, a trusted employee and a good friend. He will be sorely missed.

John Fucik Horticulturist, (Retired)

CITRUS BLACKFLY UPDATE

Citrus blackfly (CBF) continues to plague western Valley citrus orchards. In fact, the area and number of CBF-infested orchards has increased as shown in recent aerial infrared photographs taken by the USDA-ARS-KARC Remote Sensing Unit. On site inspection showed developing CBF populations in several of these orchards, but it was encouraging that low numbers of adult *Encarsia opulenta* parasites were already present. These parasites had undoubtedly moved from nearby orchards where earlier releases had been made and now were well established, with percent parasitism of CBF often exceeding 90%, and numerous active adult *E. opulenta* on virtually every leaf.

It is imperative that a rigorous program of parasite collection and redistribution be undertaken to prevent further spread of CBF. To expedite this, a special 'hands on' training for growers was recently held at Texas Citrus Mutual (TCM) in Mission. Mr. Ray Prewett, TCM President, put together the program. Subjects covered included: CBF biology and stages attacked by the two parasite species (*E. opulenta* and *Amitus hesperidum*); field parasite identification, collection and distribution methodology. Also, participants were provided a work sheet listing insecticides/ miticides commonly applied on Texas citrus. Considerable discussion ensued pertaining to toxicity and impact of the various chemicals on the two parasites, and potential disruption of an effective CBF biological program. It was emphasized repeatedly that when it became necessary to make chemical applications in orchards where parasites had been released—that a small block of trees be left unsprayed. Thus, providing a field insectary for reestablishment of the parasites again throughout the orchard.

Several entomologists with extensive experience in previous Valley CBF outbreaks have again offered their services and are actively involved in developing an effective management and biological control program for the current CBF outbreak. Entomologists involved are: Dr. Rod Summy, currently a Biology Professor at Univ, of Texas-Pan American. Rod was a key note speaker and discussion leader at the TCM/ Grower Training Meeting, and will actively monitor CBF parasitism levels in orchard release sites. Mr. John Worley, Facility Director at the USDA-APHIS Mexican Fruit fly Rearing Facility and Dr. Matthew Ciomperlik, APHIS-PPQ Pest Detection, Diagnostics & Management Laboratory, located at Moore Air Base, Mission, TX—both are collaborators in development of a program for mass rearing *A. hesperidum*. Most recently, we have enlisted the help of Dr. Roy Parker, Professor and Extension Entomologist at Corpus Christi, TX. He is over seeing CBF/parasite surveys of dooryard citrus in the Corpus Christi area as a potential parasite source, particularly for *Amitus hesperidum*. More on CBF forthcoming in future Newsletters.

J. Victor French

WHAT DO WE KNOW ABOUT GRAPEFRUIT-DRUG INTERACTIONS?

In recent years research in the center's functional food lab and other labs strongly suggest that many chemicals in grapefruit (such as limonoids, lycopene, vitamin C, flavonones) have potential benefits in preventing certain cancers and heart disease.

Unfortunately, much of this work has overshadowed by reports in the media of negative effects of consuming grapefruit juice with certain prescription drugs. It appears that grapefruit contain some chemicals that inhibit certain gut enzymes and transport systems, causing the bio-availability of a drug to be increased, resulting in potential overdoses. The history of this discovery dates back to 1989 when it was noted that grapefruit juice masked the taste of alcohol, and this in turn led to the discovery of an interaction between grapefruit and felodipine. Studies in different labs have since shown that other drugs which are also metabolized in the intestine (eg. cyclosporine, midasolam, triazolam, terfenadine), if taken with grapefruit juice, appear in higher concentrations in the blood.

Efforts are now underway in both Texas and Florida to obtain grants to study this situation. First we need to know which components are responsible. The main group appear to be the furocoumarins; these are not available commercially for researchers to use, so attention has been concentrated on extracting and purifying them. Collaborative work with UT-Austin and UT-PanAm and one of our students, Basavraj Girennavar, has made good progress.

Future research will be directed towards answering many questions including- are there differences between different grapefruit varieties, are the differences between fresh squeezed and stored juice, between hand squeezed and commercially squeezed juice, and between fresh fruit and juice. Medical research is also needed to establish what risks there are of possible overdoses. Recent studies by Florida cardiologist Patrick Reddy of the Watson Clinic, Lakeland FL, demonstrated with 135 volunteers that an 8-ounce glass of grapefruit juice can increase the effectiveness of Lipitor, a cholesterol-lowering medication, without harmful side effects.

Bhimu Patil

WATER UPDATE

Believe it or not, the reservoirs have about 58 percent of conservation level (U.S. share) and about 31 percent (Mexico share). Not only is the current level higher than it has been in many years, Mexico has already surpassed its treaty-required 350,000 acre feet annual provision. Of some 386,000-acre feet provided by Mexico since the accounting year began on October 1, 2003, the lion's share came from in-storage transfer, with the balance from in-flows from the six designated tributaries. Lest you misunderstand, these inflows resulted from rainfall that occurred downstream from impoundments—as there has been no release of water from impoundments on the six designated tributaries.

Despite the fact that Mexico is meeting its annual obligations (mostly from in-storage transfers), the water debt of some 1.3 million acre feet is still out there. Valley leaders are hopeful that the extra 36,000 acre feet above the annual requirement is indicative that Mexico may yet do something significant about repaying the debt. The debt is still a matter of concern and discussion, not only for those most affected, but also at both state and federal levels.

Meanwhile, growers should feel good in the knowledge that at least the prospects for adequate irrigation water supplies are there for this season. The caveat is that we may see an increase in acreages planted to cotton, corn and grain as a consequence of the better water supply. Obviously, it is the responsibility of all users, but especially of irrigators, to use the water wisely and not waste it by overwatering and filling up the drainage ditches with tail water.

Julian W. Sauls, Ph. D.
Professor and Extension Horticulturist

THE TEXAS AGRICULTURE PROGRAM HONORS WAYNE SHOWERS

At the Agriculture Conference held at College Station early in January, Wayne Showers received the Distinguished Texan in Agriculture Award from the Agriculture Program of the Texas A&M University System. Wayne and his family have been involved in citrus production from the very early years of the industry. His father, Chester Showers, came to the Valley to open and prepare land to be planted to citrus. Being a citrus grower himself, Wayne's father built his home in an orchard so Wayne grew up surrounded by orange and grapefruit trees. Their love for citrus and their involvement in the industry led to both being named King Citrus during the Citrus Fiesta, Chester in 1955 and Wayne in 1993. Wayne received this prestigious award for his exceptional support of TAES and TCE programs, as well as for his support of the entire Texas A&M University System, serving as a member of the Board of Regents for six years. Among the many honors received, he was recognized as Distinguished Alumnus both the Association of Former Students and by the College of Agriculture and Life Sciences.

Jose Amador

PRESIDENT RUMALDO JUAREZ AND DEAN RON ROSATI RECOGNIZE GREG PANZER'S CONTRIBUTIONS TO THE CITRUS CENTER

Dr. Rumaldo Juárez found time in his busy schedule to travel in the evening to Weslaco for the sole purpose of attending Greg's funeral. While visiting with him, Dr. Juárez indicated to me that the reason he came was to recognize and honor Greg for his dedication, devotion and personal involvement during his adult lifetime to the mission of the Citrus Center. Dr. Juárez cited a visit he made to the Citrus Center and while visiting with Greg, he was touched by his passion for helping students and faculty at the Citrus Center so they could excel in their work. Because of this visit with Greg, and the way he expressed his desire to help the students, President Juárez made resources available to the Citrus Center to buy additional computers so we could create a computer room where students would have easy access to the internet and all other programs that can be accessed with computers. Dr. Rosati also traveled from Kingsville to attend the funeral for similar reasons, having known and interacted with Greg during the many visits he has made to the Citrus Center.

Jose Amador

NATURALLY GROWING TRIFOLIATE ORANGE AND CITRUS CANKER STATUS IN WOODED AREAS OF EAST TEXAS

The trifoliate orange (*Poncirus trifoliata)* is a relative of citrus and originates in China. As the name implies, its leaf is divided into three leaflets, hence the name *P. trifoliata*. The fruit is not edible (some hybrids are barely fit for human consumption). These trees shed leaves at the end of the growing season (=deciduous) and they bear large thorns. The tree is cold-hardy, resistant to tristeza virus and is a good rootstock. It was first introduced into the U.S in 1869 by William Saunders. Later, a large number of trifoliate rootstock plants were introduced from Japan into the U.S, including to Houston and surrounding areas in the early 1900s. Historical evidence indicates that Alvin, a town south of Houston received many of them. Unfortunately, this importation also inadvertently introduced citrus canker disease from Japan into U.S. Thus, began a saga of eradication and legal battles surrounding canker disease in Florida.

Severe infection with canker can cause tree defoliation of infected trees, dieback, fruit blemish, reduced fruit quality, and premature fruit drop. Fruit, leaves, and twigs of infected plants may show small, round, and blister-like symptoms which are commonly called canker lesions. Lesions usually become apparent about 7 to 14 days after infection with the bacterium. As the lesions mature, the epidermis ruptures, and it may be lined with a halo. On fruit, the lesions may show a corky appearance. On leaves, old lesions sometimes fall out, leaving behind a hole at the place of the lesion. The disease is most likely to develop when heavy rains occur during a period when the mean temperature is greater than 68°F.

Canker disease was present in Texas in the early 1900s; however, it was effectively eradicated by the 1940s at a considerable expense. There was a county wide eradication of trifoliate oranges during the Depression time. Many plant pathogens are known to survive for many years. Therefore, it is natural, scientific curiosity asking whether remnants of citrus canker, if any, are still present in Texas. One of the most likely areas is around Houston. A majority of dooryard citrus in east Texas and Louisiana are now grown on trifoliate orange rootstock. In addition, we learnt that a lot of trifoliate oranges grow wild in wooded areas in many counties in east Texas.

The USDA-APHIS provided financial support to conduct a pilot study for the presence of canker in wooded areas. USDA has interest in this study because of economic importance of citrus canker. The Department of Homeland Security was interested in this study because the citrus canker bacterium is one of 22 agricultural pests under the National Homeland Security Pest List. This study was conducted between June and December, 2003.

We found that the population of naturally grown trifoliate orange is a lot larger than expected. It was present in large populations in all six counties we surveyed. Moreover, in some places we have seen thousands of trees at one site, with a large number of fruit. Thus far, we have no evidence for the presence of the bacterium, based on symptoms on leaves, stem, and/or fruit.

We cannot confirm the mode of spread of the trees. However, based on the trend that we see and testimonials from people that observed the spread in specific areas suggest a possible role of floods as a likely cause of fruit dispersal. One site we visited is a 200 acre estate. It was an open pasture 35 years ago; however, following the hurricanes in late 1970s, the estate changed its topography to a wooded area containing numerous trifoliate oranges. This hypothesis is supported by the fact that in many cases we see trifoliate clusters (50-60 plants as a bunch in one spot, indicating growth from an intact fruit compared to individual seed dispersal. Moreover, distribution by birds and animals is also a possibility. The map shown below indicates the GIS locations that were inspected. Please note the location of ponds and rivers in the map.

We acknowledge the financial support from the USDA-APHIS and work of people such as John Panzarella of Lake Jackson, **Dr. Paul Parker** and **Russell Sheetz** (GIS map) of USDA Biological Control Lab in Mission, TX.

Mani Skaria

Figure- Stars indicate survey locations

WATER CONSERVATION AND FERTILIZER MANAGEMENT STRATEGIES ON CITRUS

Preliminary first season results from a citrus research study evaluating the use of different irrigation systems (namely, flood, drip, and microspray jet irrigation) in combination with fertility trials were collected from the TAMUK Citrus Center South Farm in Weslaco, Texas. Field trials were conducted with Rio Red grapefruit in effort to compare irrigation strategies in combination with inorganic- and organic-based fertilizer trials. Three fertilizer treatment combinations with and without compost application were performed at the rate of 1 lb N/tree/year. Fertilizer treatments included a pelletilized form of biosolid (Xtend®) as a new organic-based fertilizer source, and two inorganic fertilizer sources (ammonium sulfate and triple 13). The fertility treatments evaluated were: control (no fertilizer), $(NH_4)_2SO_4$, $(NH_4)_2SO_4$+compost, Xtend, Xtend +compost, 13-13-13, and 13-13-13 +compost. Fruits were harvested mid-December 2003 and data was collected on total yield, total fresh market yield, and total yield with juice market quality. The average fruit yield data is shown below for number and pounds fruit per tree. Yield differences were statistically significant for irrigation treatments with overall yield values increasing with drip < microspray < flood irrigation (Table 1). The higher yields in the flooded plots may be attributed to the fact that these trees received approximately 4-5 more inches of total water applied to them over the 2003 growing season as compared to the total water applied to the drip and microspray jet fed trees. No statistical differences were found between fertilizer treatments (Table 2), but a general trend of lower average yields was observed for treatments with compost added compared to the same fertilizer treatments without compost. This is due to increased microbial uptake of available nutrients to breakdown the added carbon source.

Table 1. Average yield data of Rio Red grapefruit following 3 different irrigation treatments. Total yield, fresh marketable, and juice yield are results of 1 growing season, 2003 harvest, TAMUK Citrus Center, Weslaco, TX.

Irrigation treatments	Total (numer/tree)	Total (lb /tree)	Fresh (numer/tree)	Fresh (lb /tree)	Juice (number/tree)	Juice (lb /tree)
Drip	417 c	325 c	230 b	210 b	187 b	114 b
Microspray	531 b	400 b	276 b	242 b	255 ab	158 b
Flood	734 a	554 a	405 a	347 a	329 a	207 a

Table 2. Results of 3 different irrigation treatments on the average yield of Rio Red grapefruit following 3 different fertilizer treatments with and without a 2 inch compost application.[z]

Fertilizer treatment	Drip		Microspray		Flood	
	Total Wt.	Fresh Wt.	Total Wt.	Fresh Wt.	Total Wt.	Fresh Wt.
1.Control	279	180	342	144	515	282
2.NH_4SO_4	335	181	452	221	596	411
3.NH_4SO_4+ Compost	283	192	453	302	543	322
4.X-Tend	443	303	436	301	553	327
5.Xtend+ Compost	337	190	303	226	542	354
6.13-13-13	251	201	501	295	590	407
7.13-13-13+Compost	349	228	313	200	541	328

[z] all values are fruit weight (lb/tree)

Shad D. Nelson and Julien Shantidas
Dept.-Agronomy&Resource Sciences - Kingsville

STUDENTS WIN POSTER AWARDS

Four of the Citrus Centers' graduate students recently won awards for posters at two conferences. At the Texas Ag. Program Conference in College Station early in January, two of Bhimu Patil's students won awards for their posters; Shibu Paulose won second place for his poster on the effects of citrus limonoids and flavonoids on phase I enzymes, and Jairam Vanamala received honorary mention for his work on the effects of these chemicals on colon cancer reduction.

Then at the Rio Grande Valley Horticultural Society annual meeting in Weslaco at the end of January, Adriana Robbins, one of Eliezer Louzada's students, won 1st prize for her poster on characterizing cold tolerance gene in citrus, while 2nd and 3rd prizes were won by Patil's students Jun Yu and Shibu Paulose (again) respectively.

Bhimu Patil & Eliezer Louzada

RECENT VISITORS

The Citrus Center recently hosted several visitors. They were Dr Robert Crocker (TDA, Austin), Bradley Urbanczyk (new TAMUS safety officer, College Station), and several agric. chemical representatives- Eva Subido & Kenneth Zimmerhanzel (Gowan, AZ), Al Villalobos (Valent), Kevin Hagedorn & Joe Mitchell (BASF). An interesting Valley visitor was Martin Winchester, a teacher from the IDEA Academy who brought 70 students to see how citrus trees are propagated.

Subscriptions to the bimonthly Newsletter are $5 a year or $8 for two years. International rate is $7 a year. Make checks payable to Texas A&M University-Kingsville. Address comments or inquiries to Newsletter Editor, Texas A&M University- Kingsville Citrus Center, 312 N. International Blvd, Weslaco, Texas 78596 or, in the case of signed articles, directly to the staff member named. Articles appearing in the Newsletter may be reproduced, in whole or in part, without special permission. Newspapers,periodicals and other publications are encouraged to reprint articles which would be of interest to their readers. Credit is requested if information is reprinted.

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