



(UF President Machen and Syvertsen)

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Title and Department: Professor,
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Education:

B.A. Biology, Calif. State University,
Fullerton, 1970

M.A. Biology/Plant Ecology, CSUF, 1973

Ph.D. Plant Ecology, New Mexico State
Univ., Las Cruces, 1977.

Research Interests (with focus on Tropical Agriculture)

Research interests focus on environmental stress physiology of citrus trees growing all warm climatic areas with adequate drainage from deserts to tropical environments. The CRIS Project FLA-LAL-04708, Abiotic and Biotic Effects on Physiology, Growth and Yield of Citrus, includes effects of physical stresses (eg., drought, flooding, salinity, high temperature, mechanical) and biological stresses (pests and diseases) on citrus tree uptake, allocation and loss of water, nutrient and carbon resources. Tree responses to stresses include water relations, nutrient budgets, leaf photosynthesis, growth, fruit yield and quality. This work seeks to understand how citrus trees function to better enable Florida growers to adjust their production practices to avoid environmental stresses that negatively impact citrus tree and fruit development. Thus, this basic understanding of the physiological behavior of citrus trees not only deals with fundamental research on tree form and function in different climates including the tropics, but also benefits the Florida citrus industry.

5 recent representative publications:

García-Sánchez, F**, J.P. Syvertsen, P. Botía and J.G. Perez-Perez. 2007. Physiological Responses of Two Citrus Rootstock Seedlings to Flooding and Drought Stress. *Physiol. Plantarum* 130: 532–542.

Pérez-Pérez, J.G*, **J.P. Syvertsen**, P. Botía and F. García-Sánchez. 2007. Leaf water relations and net gas exchange responses of salinized Carrizo citrange seedlings during drought stress and recovery. *Ann. Bot.* 100: 335-345.

Syvertsen, J.P. and L.G. Albrigo. 2006. Tree growth, development and productivity. Chp.13 p. 113-124. In: Tucker, D.P.H., J.S. Rogers, E.W. Stover and M.R. Ziglar (eds.). *Florida Citrus: A Comprehensive Guide*. IFAS, Univ. FL, Gainesville. 413 pp.

Syvertsen, J.P. 2006. Influence of environmental stresses on tree growth and productivity. Chp. 14 p 125-132. In: Tucker, D.P.H., J.S. Rogers, E.W. Stover and M.R. Ziglar (eds.). *Florida Citrus: A Comprehensive Guide*. IFAS, Univ. FL, Gainesville. 413 pp.

Levy, Y. and **J. P. Syvertsen**. 2004. Irrigation water quality and salinity effects in citrus trees. In: J. Janick (ed.). *Horticultural Reviews* vol 30: AVI Pub., Westport, CT. p. 37-82.

Examples of Extramural support during past 5 years:

Date	Value	External Funding Agency	Role	My share (\$)
2006 - 2007	\$20,290	Georgia-Pacific Inc.-Foliar N uptake	Co-PI	10,145
2005-2006	\$153,300	FDACS- Microbial soil amendments and tree health	Co-PI	76,650
2005	\$15,000	INIA –IADB, UY- Crop load and N effects on fruit quality	PI	15,000
2005	\$7,200	SENECA Foundation, SPAIN- Soil substrate and salinity	PI	7,200
2004 - 2005	\$75,000	FDOC- Mechanical harvesting and tree health	PI	75,000
2004 - 2005	\$23,321	FI DACS FCPRAC- Foliar N uptake efficiency	PI	23,321
2003 - 2004	\$75,000	FDOC- Stress effects on sheepnosing in grapefruit	Co-PI	75,000
2003 - 2004	\$324,000	FI DACS FCPRAC Root weevil stress effects on citrus	Co-PI	40,000
2002 - 2003	\$353,000	FI DACS FCPRAC Root weevil stress effects on citrus	Co-PI	55,000

Teaching Interests (with focus on Tropical Agriculture): NA

Extension/Outreach Interests (with focus on Tropical Agriculture)

MEMBER PARTICIPANT IN EXTENSION PROGRAM **PRG-721 - Mechanical Harvesting Effects on Citrus Tree Health.**

Situation: In spite of long term studies showing no tree mortality or decreases in yield in citrus trees that are annually mechanically harvested, growers are concerned about visible

injuries that can include leaf loss, twig damage, root exposure and young fruit removal that frequently occur during mechanical harvesting.

Rationale: We are investigating physiological effects of mechanical harvesting on tree growth, root damage, leaf loss and bark damage. Studies include mechanical harvesting interactions with abscission chemicals to loosen fruit and with tree drought stress effects. We are using winter time drought to delay flowering to avoid losses of next years during late season Valencia harvesting.

Impacts: Recommendations to minimize tree stress during mechanical harvesting are being developed. Growers are now avoiding drought stress during harvest and using winter time drought stress in Valencia to increase efficiency of mechanical harvesting.

MEMBER PARTICIPANT IN EXTENSION PROGRAM **PRG-1165 - Tree Recovery After Hurricane Damage.**

Situation: Parts of the Florida citrus industry sustained serious damage after three successive hurricanes in the late summer and fall of 2004. Tree on the east coast suffered additional storm damage in 2005.

Rationale: We are investigating effects of mechanical injury from wind and effects of flooding on root health and tree recovery.

Impacts: Recommendations on post hurricane management practices have been developed that have guided growers through grove rehabilitation and tree recovery. (See 15.g., i. and 16 for other relevant extension oriented publications and presentations).

International Activities (with focus on Tropical Agriculture) Last 7 years:

2006-present **Uruguay.** UF/IFAS-INIA-Uruguay Cooperative Agreement Program Manager.

2007. **Italy** 2 week research visit to Palermo, Sicily. Seminar: "Citrus drought and salinity stress".

2005. **Spain.** 3 month research visit to Murcia Spain with F. Garcia-Sanchez (Univ. Espinardo) supported by the Seneca Foundation to work on "Mechanisms of salinity tolerance in citrus rootstocks".

2005. **Uruguay.** 2 weeks. UF/INIA-UY Cooperative Project. Visited and toured citrus production area, reviewed INIA citrus research program and gave seminar "Shade effects on citrus fruit quality" in Salto

2005. **Australia.** 3 weeks. Visited and toured citrus production in the Riverlands. Gave seminar "Salinity, shade and mechanical harvesting stress in citrus. at CSIRO, Merbein

2004. **Morocco** 3 weeks. Attended ISC2004 in Agadir then toured citrus and other horticulture in Morocco.

2003. **Spain.** 2 weeks. Visited and toured citrus and vegetable research and production with UF Citrus Club.

2003. **Nigeria.** 2 weeks. Winrock Foundation Volunteer to help expand the citrus rootstock base in tropical Nigeria from the NIHORT Research Center, Ibadan.

2003. **Mexico.** Attended Encuentro Interamericano de Cítricos (EIC 2003) in Veracruz, and presented "Efecto de las altas temperaturas y humedad relativa baja en la fisiología y productividad de los cítricos."

2001. **Uruguay.** Short term (3 months) research visit on crop load and shade effects on citrus tree photosynthesis. INIA Salto-Grande Citrus Research Station, Salto, UY.