

PROCEEDINGS
OF THE
NINETY-EIGHTH ANNUAL MEETING
of the
**FLORIDA STATE
HORTICULTURAL SOCIETY**

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CONVERSION: U.S. & METRIC MEASURES

U.S. Units ²	Metric Equivalents	Conversion Factors Metric to U.S.
Length or Thickness		
1 mile	= 1.6093 kilometers (km)	X 0.6214
1 yard	= 0.9144 meters (m)	X 1.0936
1 foot (ft)	= 0.3048 m	X 3.2808
1 inch	= 2.5400 centimeters (cm)	X 0.3937
1 mil (1/1000 inch)	= 0.0254 millimeters (mm)	X 39.3700
Area		
1 square inch (inch ²)	= 6.4516 square centimeters (cm ²)	X 0.1550
1 square yard (yd ²)	= 0.8361 square meters (m ²)	X 1.1960
1 acre	= 0.4047 hectares (ha)	X 2.4710
1 section (mile ²)	= 258.988 ha	X 0.0039
Volume or Capacity		
1 pint	= 0.4732 liters	X 2.1133
1 gallon (gal)	= 3.7853 liters	X 0.2642
1 bushel (bu)	= 35.2381 liters	X 0.0284
1 acre-inch	= 102.7938 cubic meters (m ³)	X 0.0097
1 Fla. field box (4,800 inch ³)	= 0.7866 hectoliters (hl)	X 1.2713
1 Fla. citrus carton (4/5 bu)	= 0.2822 hl	X 3.5436
Weight		
1 ounce (oz)	= 28.3495 grams (g)	X 0.0353
1 pound (lb.)	= 0.4536 kilograms (kg)	X 2.2046
1 hundredweight (cwt)	= 45.3592 kg	X 0.0220
1 ton	= 0.9072 metric tonnes	X 1.1022
Rate or Yield		
1 grain/pound (gr/lb.)	= 0.1429 grams/kilogram (g/kg)	X 7.0000
1 pound/acre (lb./acre)	= 1.1208 kilogram/hectare (kg/ha)	X 0.8922
1 ton/acre	= 2.2417 metric tonnes/hectare	X 0.4461
1 gallon/acre (gal/acre)	= 9.346 liters/hectare	X 0.1070
1 Fla. field box/acre	= 1.9437 hectoliters/hectare (hl/ha)	X 0.5162
1 bushel/acre (bu/acre)	= 0.8705 hl/ha	X 1.1488
1 pound/100 gallons (lb./100 gal)	= 1.1983 grams/liter (g/liter)	X 0.8345
1 cubic foot/minute (ft ³ /min)	= 0.4720 liters/second (liters/sec)	X 2.1186
Energy, Light, & Pressure		
1 horsepower (HP)	= 0.7457 kilowatts (kw)	X 1.3410
1 foot candle (ft-cp)	= 10.7639 lux	X 0.0929
1 pound/square inch (psi)	= 70.3069 grams/cm ²	X 0.0142
1 British Thermal Unit (BTU)	= 0.2530 kilogram calories (kg-cal)	X 3.9526
Temperature		
$\text{Fahrenheit} = \frac{(C \times 9)}{5} + 32 \qquad \text{Celsius (Centigrade)} = \frac{(F - 32) \times 5}{9}$		

²Note that these are United States measures which often differ from British, eg., the ton, hundredweight, bushel, gallon, etc.

EDITORIAL POLICY

The Society follows the editorial policies of the American Society for Horticultural Science. The only exceptions to this relate to the need to serve growers, amateur members, and others for whom the more cryptic abbreviations, purely metric measures, etc. may be an inconvenience.

Proceedings of the **FLORIDA STATE** *Horticultural Society* **1985**

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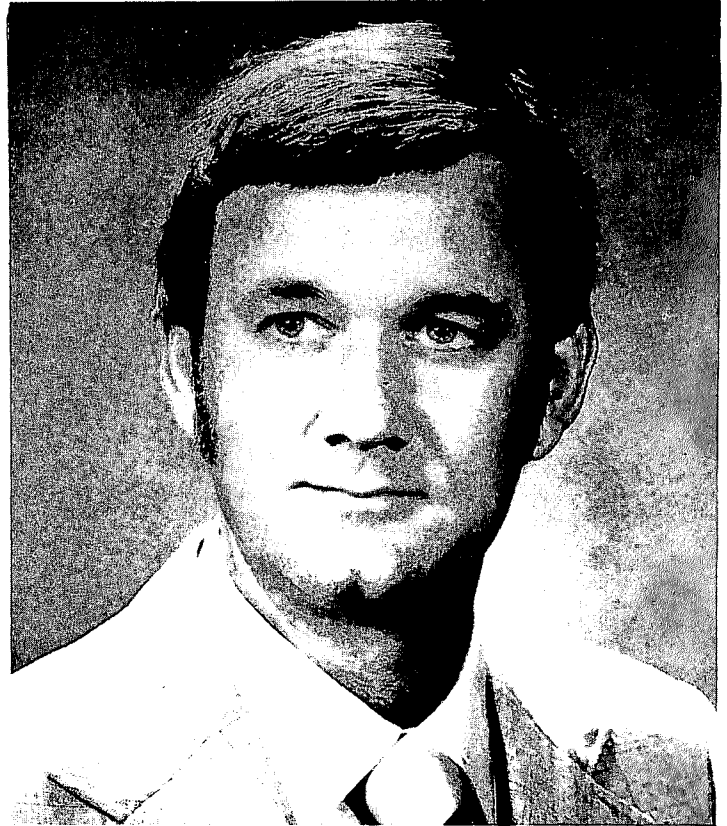
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AWARDS OF THE SOCIETY

Presidential Gold Medal Award

James F. Price

Award granted to James F. Price, IFAS-AREC, Univ. of Fla., Bradenton, for having contributed most to Florida horticulture through work published in the Proceedings of the Florida State Horticultural Society over the preceding six-year period in the Ornamental Section.



Awards for Outstanding Papers

Awards for outstanding papers in Volume 97 of the Proceedings of the Florida State Horticultural Society presented at the annual meeting of the Society (November 4, 1985) by President Fred Bistline.

Citrus Section

J. D. Whitney and T. A. Wheaton, "Tree Spacing Affects Citrus Fruit Distribution and Yield".

Garden and Landscape Section

G. E. Fitzpatrick, W. B. Snyder, and L. E. Showalter, "Development and Implementation of an Outdoor Classroom Using Native Vegetation".

Handling and Processing Section

G. E. Brown and W. F. Wardowski, "Use of Chlorine and Chlorine Dioxide in Florida Citrus Packing-Houses to Reduce Inoculum of Decay Pathogens".

Since 1892, one of the major roles of the Society has been providing, through its Proceedings, a medium for disseminating new and needed information among Florida horticulturists. Because Florida horticulture is often so different from that of the rest of the country, the Proceedings

R. C. J. Koo
R. A. Conover
J. R. Orsenigo
W. E. Waters

W. Grierson
Paul F. Smith
T. W. Young
James W. Strobel

C. A. Conover
A. H. Rouse
J. O. Whiteside
C. R. Barmore

Krome Memorial Section

E. P. Miller, "Oriental Persimmons (*Diospyros Kaki* L.) in Florida".

Ornamental Section

C. H. Peacock and A. E. Dudeck, "Evaluation of Overseeded Turfgrasses for Putting Greens".

Vegetable Section

S. J. Locascio, J. G. A. Fiskell and F. G. Martin, "Nitrogen Sources and Combinations for Polyethylene Mulched Tomatoes".

President's Industry Award

D. A. Kimball, "Factors Affecting the Rate of Maturation of Citrus Fruits".

Council Memorial Tomato Research Award

J. B. Jones and J. P. Jones, "Bacterial Leaf Spot Diseases on Tomatoes in Florida and the Control of Two Such Diseases with Bactericides".

often provide the only workable channel for such information. In 1968, the Presidential Gold Medal Award was instituted to honor authors notable for continued and useful contributions to these Proceedings. Since then, gold medal winners have been:

J. F. Morton
S. J. Locascio
C. A. Conover
J. H. Bruemmer

W. S. Castle
C. W. Campbell
R. M. Craig
V. L. Guzman

Presidents of the Florida State Horticultural Society from 1888 to Present

<i>Year</i>	<i>Presidents</i>		
1888-1896	Dudley W. Adams	1960	W. L. Thompson
1897-1904	George L. Tabor	1961	Ruth S. Wedgworth
1905-1906	C. T. McCarty	1962	John H. Logan
1907-1908	P. H. Rolfs	1963	Herman J. Reitz
1909	William C. Richardson	1964	Willard M. Fifield
1910-1922	H. H. Hume	1965	Ernest L. Spencer
1923-1929	L. B. Skinner	1966	Arthur F. Mathias
1930-1936	John S. Taylor	1967	Ed. H. Price, Jr.
1937	C. W. Lyons	1968	J. R. Beckenbach
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1943-1947	Frank M. O'Byrne	1972	R. A. Dennison
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1956	R. A. Carlton	1981	W. Grierson
1957	R. E. Norris	1982	Roger Young
1958	A. F. Camp	1983	Charles A. Conover
1959	S. John Lynch	1984	Carl W. Campbell
		1985	Fred Bistline

HONORARY MEMBERS*

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Beckenbach, J. R.	1967	Hoyt, Avery S.	1950	Reitz, J. Wayne	1955
Berckmans, P. J.	1893	Hoyt, R. D.	1914	Robinson, T. Ralph	1942
Berger, E. W.	1940	Hubbard, E. S.	1922	Rolfs, P. H.	1921
Blackmon, G. H.	1964	Hume, H. Harold	1927	Rolfs, Mrs. P. H.	1921
Bosanquet, L. P.	1924	Jamison, F. S.	1962	Ruehle, George D.	1958
Brown, Arthur C.	1952	Johnson, Warren O.	1965	Sharpe, Ralph H.	1974
Burgis, Donald S.	1980	Koo, R. C. J.	1978	Shaw, Miss Eleanor G.	1927
Camp, A. F.	1956	Krezdorn, A. H.	1979	Showalter, Robert K.	1984
Carlton, R. A.	1962	Krome, William H.	1973	Singleton, Gary	1962
Chase, J. C.	1939	Krome, William J.	1927	Skinner, L. B.	1931
Chase, S. O.	1939	Krome, Mrs. Isabelle B.	1960	Sloan, G. Dexter	1964
Clayton, H. G.	1956	Lawrence, Fred P.	1973	Smith, Paul F.	1972
Colburn, Burt	1970	Lipsey, L. W.	1924	Spencer, E. L.	1962
Commander, C. C.	1952	Logan, J. H.	1965	Steffani, C. H.	1958
Cooper, W. C.	1981	Lynch, S. John	1975	Stevens, H. B.	1934
Dickey, R. D.	1968	MacDowell, Louis G.	1968	Swingle, W. T.	1941
Edsal, R. S.	1967	Magie, Robert O.	1977	Taber, George L.	1914
Fairchild, David	1922	Mathias, A. F.	1972	Tait, W. L.	1962
Fifield, Willard M.	1955	Mayo, Nathan	1940	Talbott, George M.	1980
Flagler, H. M.	1903	Menninger, Edwin A.	1964	Tenny, Lloyd S.	1956
Floyd, Bayard F.	1944	Miller, Leon W.	1972	Thompson, Ralph P.	1962
Floyd, W. L.	1939	Miller, Ralph L.	1972	Thompson, W. L.	1962
Ford, Harry	1985	Montelaro, James	1985	Thullbery, Howard A.	1962
Forsee, W. T., Jr.	1973	Mounts, M. V.	1958	Veldhuis, M. K.	1972
Gaitskill, S. H.	1909	Mowry, Harold	1950	Ward, W. F.	1962
Gardner, Frank E.	1967	Murdock, Del I.	1984	Webber, H. J.	1941
Garrett, Charles A.	1957	Newell, Wilmon	1940	Wedgeworth, Ruth S.	1965
Goldweber, Seymour	1984	Norman, Gerald G.	1967	Wenzel, F. W.	1973
Grierson, William	1979	Norris, Robert E.	1962	Wilson, Lorenzo A.	1934
Harding, Paul L.	1968	O'Byrne, Frank M.	1962	Winston, J. R.	1960
Hart, W. S.	1909	Painter, E. O.	1909	Wolfe, H. S.	1964
Hastings, H. G.	1939	Peterson, J. Hardin	1950	Young, T. W.	1978
Hayden, Mrs. Florence P.	1934	Pratt, J. B.	1980	Yothers, W. W.	1955
Hayslip, Norman C.	1981	Redmond, D.	1893	Ziegler, L. W.	1976
Henrickson, H. C.	1939	Reed, R. R.	1970		
Holland, Frank L.	1962				

*Date year award made.

AWARD OF HONORARY MEMBERSHIP

Dr. Harry Ford



Dr. Harry Ford has been a productive member of the University of Florida Citrus Research and Education

Center at Lake Alfred. He has published over 180 scientific and research reports. He has been a member of the Florida State Horticultural Society since 1950, and has been an author on 36 papers in the Proceedings of FSHS. The papers that Dr. Ford gave were a real contribution to the annual meetings. He provided the kind of information that was valuable to growers, and his talks acted as drawing cards that attracted people to the FSHS meetings.

When Dr. Ford came to Lake Alfred, the cause of the spreading decline was not known. His work on root distribution showed that feeder roots deteriorated in trees with the decline. This clue from his root distribution work led to the later implication of burrowing nematode as the cause of spreading decline. Working on a joint USDA-University of Florida program, Dr. Ford's major contribution was the evaluation and development of Milam and Ridge Pineapple which are rootstocks with burrowing nematode resistance.

Dr. Ford went on to work with roots in poorly drained flatwoods soils. He worked on flooding, fluctuating water tables, and metabolites that were toxic to tree roots. He helped determine why drain lines and low volume irrigation lines clogged. He is now known world wide as an authority on drainage of agricultural lands. He developed the intermittent chlorine treatment procedure to reduce clogging of trickle irrigation lines by iron ochre and sulfur slimes. This work has helped allow for the expansion of drip and microsprinkler irrigation, an important development in the Florida citrus industry.

Dr. Ford came from Ohio and received his B.S., M.S., and Ph.D degrees from Ohio State University. He has helped solve not one, but several important industry problems. Because of his work that has benefited both ridge and flatwoods citrus growers, Dr. Ford is deserving of honorary membership in the Florida State Horticultural Society.

AWARD OF HONORARY MEMBERSHIP

James Montelaro



James Montelaro, Professor and Extension Specialist, Vegetable Crops Department, University of Florida, Gainesville, has been a member of the Florida State Horticultural Society since 1951. He is being nominated for Honorary Membership in the Society for his excellence in the development and coordination of extension programs in vegetable crops; for leadership in adapting intensity and balance soil testing as a production tool for vegetable growers; for outstanding efforts in training and continuing education of County Agents and growers; for development of superior extension publications for dissemination of research information to vegetable producers; and for service to the Society on numerous committees and special projects.

Dr. Montelaro was born in Melville, Louisiana on March 3, 1921. He received his B.S. from Southwestern Louisiana Institute in 1941, and entered graduate school at Louisiana State University. He interrupted his education

for service in the United States Navy during World War II from 1942 to 1947. He was awarded his M.S. from Louisiana State University in 1950. He received a Ph.D. from the University of Florida in 1952 in Horticulture and was employed by the Agricultural Experiment Stations at the University of Florida as an Assistant Horticulturist.

He began his illustrious extension career as a Vegetable Crops Extension Specialist with the University of Florida in 1953. With the exception of three years as Director of Vegetable Research for Minute Maid Cooperation, his professional career was devoted to Cooperative Extension work in Florida. In this capacity he was innovative and aggressive in transmitting research-based horticultural information to growers. He was instrumental in developing techniques for field days, demonstrations, work programs, grower schools and other methods for training and continuing education of growers and County Agents. Production guides introduced with his assistance provide brief, clear information for grower use. Jim attained professorial rank in 1965 and assumed the additional duties of Departmental Extension Section Leader in 1973.

Dr. Montelaro is greatly respected by his colleagues throughout the state and the nation and by County Agents, commercial service industry representatives, and growers. He is recognized for his leadership in developing production practices and for his extension work with soil testing, intensity and balance measurements, fertilization, and soluble salts and water quality. His counsel was widely sought and highly valued by his professional colleagues and the vegetable industry he served. As a vegetable "troubleshooter", Jim had few peers. Whenever a crisis arose in the industry, such as severe cold or disease outbreak, he was the first on the scene to assess the situation and advise others on proper actions.

Dr. Montelaro promoted horticulture and the Society in all of his work. He served as Vegetable Section Vice President, worked on various committees within the Society, and presented papers within the Vegetable Section.

Dr. Montelaro was recognized by his colleagues for his many contributions to horticulture. In 1976, he had been selected by the Florida Association of County Agents as the Outstanding Specialist of the Year. In 1977, he was awarded the Henry M. Covington Extension Award for the Southern Region American Society for Horticultural Science. He received the Carl S. Bittner award for excellence in extension work, presented in 1978 by the American Society for Horticultural Science. Dr. Montelaro retired from the Vegetable Crops Department in 1981 as Emeritus Professor.



FRED W. BISTLINE
Forest City
PRESIDENT OF THE SOCIETY—1985

PRESIDENTIAL ADDRESS

FRED W. BISTLINE
The Coca-Cola Company
Foods Division
P. O. Box 3216
Forest City, FL 32714

Ladies and gentlemen, welcome to the 98th Annual Meeting of the Florida State Horticultural Society. I don't know of a greater honor to a person who has spent his life in Florida agriculture than to be president of this society. It is truly an honor of which I will always be proud.

I want to introduce you to the Executive Committee: Carl Campbell, Chairman, Bob Berry, Secretary, Ronnie Reed, Treasurer, Tom Sheehan, Program Coordinator, Pete Timmer, Editor, and Jim Barrett, Associate Editor and soon to be Editor, Members-At-Large Sydney Park-Brown and Errol Fielding, and all the vice presidents, who will be introduced later. To all of you, I want to thank you for the many hours you have spent this year working for the Society.

IFAS has put together a very comprehensive study entitled "Florida Agriculture in the Eighties". I would like to comment on some of the interesting facts I have gleaned from these reports. Floraculture is valued at \$100.7 Million, ferns \$50 Million, foliage \$162 Million, turf \$25 Million, and woody ornamentals at \$120 Million. This brings the total in the ornamental field to somewhat over \$457 Million. For Florida vegetables, tomatoes, of course, are by far the greatest, with \$256 Million, followed by potatoes at \$72 Million, peppers at \$64 Million, etc. until the total for all vegetable crops is \$862.4 Million.

Many of the crops that we have under the Krome Memorial Institute are in the study as tree crops, and many of these did not have dollar values, but it is interesting to note that avocados and limes are reported at \$25 Million net value. Blueberries, grapes, mangoes, and other tropical fruit, peach and nectarines now total 8,300 planted acres. The value of our citrus crop *on the tree* is in excess of \$1 Billion.

From these reports I learned that the on-farm value of the horticultural crops represented at this meeting is in excess of \$2.36 Billion per year. This, of course, does not take into account any of the packing houses, processing plants, and agro-business that is directly connected to agriculture in Florida.

These are just some of the statistics that we need to remember because we are bombarded day in and day out by statements that Florida survives on the tourist dollar. Florida's economy needs both agriculture and tourist.

Let's go to an entirely different subject. Everyone seated here is a member of The Florida State Horticultural Society. I want us to think for just a moment about what this society really is. For one thing, it is a 98 year record of just that - the horticulture of Florida. The Florida State Horticultural Society is the only organization in Florida where growers and scientists meet and can take part in any one of the six sections - Citrus, Vegetable, Gardening & Landscaping, Processing, Krome, and Ornamental. Nowhere else can one go and be brought up-to-date on so

wide a variety of problems and achievements for horticulture in Florida.

Organizations are generally what they say they are. The Entomology Society talks about insects, the Nematology societies talk about nematodes, the Soil and Crop Society talks about soils and how they relate to crops, but in this society one can enjoy papers presented on all of these subjects and on many crops. This is a society where the scientist presents his data to the people who are going to use it. Of course, I am talking about the grower. It is also a society where the grower has a chance to tell the scientist what he has observed or found in his own individual situation. This society has always encouraged growers to publish in the Proceedings and still does.

Change is a necessary part of Florida agriculture. In the past 30 years nearly all horticulture has changed. Before, we had large crews harvesting vegetables. Today, much harvesting is mechanized. In vegetables and ornamentals new varieties have been introduced, replacing the older ones with varieties that are suitable for mechanical harvesting or have other benefits such as disease resistance or better shipping quality.

In the past 30 years the production of citrus has changed very dramatically, as well as the processing of citrus. Just to mention a few, we have evolved in the care of young trees from land hoe, to mechanical hoes, to almost total utilization of herbicides for weed and grass control.

Thirty years ago, if a grove was irrigated, you used joints of perforated pipe moved row by row by hand through the grove. Today, most groves have permanent irrigation either overhead or low volume such as micro jets or drip.

The processing of citrus has improved dramatically in the efficiency of removing water and the automation of plant operation.

One area that has not changed is in the harvesting of the fruit. It is still picked by hand.

I cannot leave citrus without referring to the Florida Crop & Livestock Reporting Service issue of August 22, 1985. It is a special report on the remaining acres in the northern 14 counties of the citrus area of Florida. In 1982 the total of producing acres in these 14 counties was 277,036 acres. In 1984, after the Christmas freeze of 1983, the figure dropped to 177,482 acres. In the summer of 1984 following the January freeze, the viable citrus had dropped to 58,973 acres. This is a reduction of 218,063 acres. The ability of these growers to replant a portion of these acres has been further delayed with the discovery of citrus canker and the destruction of over 12 million young citrus seedlings and trees, and I am sure this figure will go much higher.

As agriculture has changed to stay in business, so must the Florida State Horticultural Society change to stay the vital organization it is. The Executive Committee on November 3, 1985 adopted the following changes in the Society's "Publication Policy Statement". We deleted the requirement that a paper has to be original and unpublished. However, we still encourage original papers but felt that this change would benefit the Society by allowing the scientists to publish their work in referred journals where

they would receive full credit for their work by their review committee. The vast majority of these publications will never be seen except by other scientists. With only slight modification, these papers could be presented at the Florida State Horticultural Society and heard by people who will be putting these beneficial findings into actual use in

the fields and groves of Florida. I firmly believe that this decision was a good and needed change. I urge all of you to work together and make the next 98 years as successful as the past 98 years.

Thank you.