VEGETARIAN
A Vegetable Crops Extension Publication

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COOPERATIVE EXTENSION WORK IN AGRICULTURE AND HOME ECONOMICS, STATE OF FLORIDA, IFAS, UNIVERSITY OF FLORIDA, U.S. DEPARTMENT OF AGRICULTURE, AND BOARDS OF COUNTY COMMISSIONERS COOPERATING.
I. NOTES OF INTEREST

A. New Publications

(1) Potato Production in Florida, Extension Circular 118 by W. M. Stall and M. Sherman is available from the Publications Distribution Center, University of Florida, Building 660, Gainesville, Florida 32611.


(3) The following publications are available from the Bradenton Agricultural Research Center, 5007 60th Street, East, Bradenton, FL 33508:


(b) Broccoli Variety Trials in Florida, Fall, 1982, Bradenton AREC Res. Rept. BRA1983-8, by A. A. Csizinszky.


(Maynard)

B. Vegetable Crops Calendar

(1) Sanford AREC Open-House and Research Update

Tuesday, May 17, at 1:30PM. Faculty will be available to discuss current research field trials. All interested persons are invited. For more information, contact Bill Llewellyn, Seminole County Extension Service, (305) 323-2500, ext. 178.

(Sherman)

(2) Vegetable Crops In-Service Training and Planning Conference

The Commercial Vegetable Crops In-Service Training will be held June 6-8, 1983, in Tallahassee, Florida. The Commercial Vegetable Crops Extension Planning Conference will be the afternoon of June 8 at the same location. The sessions are open to Florida Extension agents and specialists, and designed for those with
commercial vegetable crops responsibilities. The Planning Committee has put together a good program this year, based on the requests of the planning session the previous year.

An outline of the programs is as follows:

COMMERCIAL VEGETABLE CROPS IN-SERVICE TRAINING

June 6
Leon County Extension Office

12:00PM Box Lunch and Welcome
1:30PM Welcome and Remarks - John D. Stiles
1:45PM Methodology of Marketing - Dr. Elmer Close
2:15PM Marketing Information - Jack Varick
3:00PM BREAK
3:15PM State Farmers' Markets - W. O. Whittle
3:30PM Fair Treatment in the Marketplace - Glenn Bissett
3:45PM Market Development - Paul Newell
4:00PM International Marketing - Tony Fendrick
4:15PM Discussion
4:30PM ADJOURNMENT
6:30PM Dinner - sponsored by Florida Fruit and Vegetable Association

June 7
Leon County Extension Office

8:00AM Introduction - John J. Vansickle
8:15AM Principles of Marketing - Timothy Hewitt
9:00AM Developing Production Cost Budgets - Timothy Taylor
9:45AM BREAK
10:00AM Developing Price Expectation - John J. Vansickle
10:45AM Risk and Enterprise Selection - John Holt
11:30AM Wrap-up and Discussion - John Stiles and John J. Vansickle
12:00PM Box Lunch (Dutch Treat)
2:00PM Thomasville Farmer's Market
4:00PM Tour of Commercial Vegetable Production - J. C. Russell and S. M. Olson
6:00PM Tour of Vegetable Plots at Quincy AREC - S. M. Olson
7:00PM Dinner with Vegetable Crops Faculty and Industry Hosts - Sponsored by Florida Fruit and Vegetable Association

June 8

8:30AM Visit to the Bureau of Fertilizer, Seed and Pesticide Laboratories, Division of Chemistry, Tallahassee
COMMERCIAL VEGETABLE CROPS EXTENSION PLANNING CONFERENCE

June 8

1:30PM Discussion of County Plans of Work - bring copies of your plan of work and be prepared to discuss your ideas on these subjects

3:00PM Discussion of needs for Cultivar Demonstrations - G. A. Marlowe

3:30PM In-Service Training Planning for Next Year - S. P. Kovach

4:00PM Herbicide Weed Control Demonstrations - W. M. Stall

4:15PM Conference Evaluation and Election of Next Year's Committee

(Stall)

II. COMMERCIAL VEGETABLE PRODUCTION

A. Canadian EBDC Tolerances on Snapbeans

A number of fresh green bean shipments originating in Florida and exported to Canada were found to contain residues of Ethalenebisdithiocarbamates (EBDC). Canada considers vegetables with residues of EBDC greater than 0.1ppm to be adulterated and several shipments have been returned.

W. George Fong, Chief, Chemical Residue Bureau, FDACS in a letter to Dean Woeste reported that his laboratory has analyzed eight (8) snap bean samples since October 1982. No EBDC residues were found on six (6) of the samples, one contained 0.16ppm and another 0.15ppm EBDC. Tolerances for Maneb and Zineb on fresh beans in this country are 10.00ppm and 7.00ppm, respectively. Therefore, the last two samples would be legal in Florida and the US, but considered adulterated by the Canadian government if exported there.

Florida growers should be aware of the differences in tolerances if they wish to export to Canada. Growers wishing to export to Canada may wish to switch from the use of EBDC to other effective fungicides. Refer to Plant Protection Pointer No. 6 for the control of specific diseases by labelled compounds.

(Stall)
(B) Portable Field Testing Meters for pH and Soluble Salts

County Extension Agents, fertilizer fieldmen, crop consultants and growers frequently have need for a rapid assessment of the pH and/or total soluble salts of the soil solution. This need may be part of a routine monitoring process or for field diagnosis of a particular crop problem in which pH or salt concentration may be suspected. Portable meters of rather high precision are available and their cost is within easy price range of most serious crop consultants, fieldmen and growers. The meters are simple to use, give repeatable and accurate readings within one minute or less, and are small and lightweight for easy transport.

Well water samples can be read directly on most of the portable meters. Soil samples of moderate moisture should be diluted with equal volumes of water, dry soils with one and one half volumes of water to 1 volume of soil. Greenhouse "soil" or media should be diluted with twice as much water (1 volume media and 2 volumes of media) as "soil". These suspensions should be stirred for about 15 to 20 seconds, allowed to stand for approximately 30 seconds, and the liquid portion poured into the test cell of the instrument or the probe should be inserted into the container holding the soil water mixture.

These portable meters work on the same principle of measuring conductivity as the laboratory models. Most of these instruments measure total dissolved solids and are referred to as TDS meters. A small degree of accuracy may be sacrificed, and these meters are not meant to replace their more sophisticated counterparts. Many meters read directly into a parts per million scale; whereas, other meters read in mhos (the reciprocal of electrical resistance the OHM).

In order to convert this volume to volume relationship to a weight to volume relationship of true soil moisture, all readings of soil (moist and dry) and media should be multiplied by a factor of 5. For example, a well water sample reading 800 would be 800 ppm of total dissolved salts. A soil moisture of 800 ppm multiplied by 5 would be a true reading of 4000 ppm.

pH readings are handled in much the same way. Dilution factors seem to be less critical with pH readings than they do with salts.

Some meters measure pH and salts in the same cells which further reduces the amount of equipment needed to make the readings. Distilled water should be used at all times. The test
cells should be rinsed thoroughly between samples, and frequent testing of known sample concentrations should be made. Meters with pH cells should be checked with known pH standard solutions.

Most of the meters available are battery operated and with care will last many years with only a yearly change of batteries. Some meters have a very limited pH and total dissolved solids range while others provide a wide scan of values. For Agricultural purposes a range of 0 to 5000 ppm total soluble salts is adequate. If desired, an extended scale can be added or extra sample dilutions can be made. A pH range of from 3 to 10 is adequate for most trouble shooting purposes.

We do not endorse any particular equipment. Interested persons can purchase single purpose or multi-purpose portable meters through major agricultural supply houses in various parts of the state.

In full bed mulched vegetables a series of samples across the bed at various depths may be needed to assess a nutritional problem. A "profile" of the bed can be constructed in less than an hour.

These meters do not tell what "salts" may be in excess or deficit, or the cause of a specific pH reading. They do serve a very valuable field diagnostic role by quickly indicating if the field has insufficient or excess salts at various depths, or if the pH is seriously out of balance.

(Marlowe)

C. Irrigation Water Management

I. Introduction

Irrigation water management is the process of controlling or regulating irrigation water applications in a manner that will satisfy the water requirements of the crop without wasting water. A proper water management program involves applying water in accordance with crop needs, in amounts that can be held in the soils so that the crop can use it, and at rates that meet the intake characteristics of the soil.

II. The Plant

Water, gas exchange (carbon dioxide and oxygen), light and essential elements are all necessary for plant growth. Water
comprises 75-95% of the fresh weight of stems and leaves and 85-95% of the fresh weight of fruits. It is estimated that a plant uses less than 5% of the total water which passes through it. The remaining 95% of the water is lost from the plant through the process of transpiration. Transpiration being the evaporative loss of water vapor from the leaves through pores in the leaves called stomates (see Figure 1).

When the stomates are open they may occupy only 1% of the leaf area. Usually there are more stomates on the underside of the leaf than on the upper part of the leaf. For example, a tomato plant may have 1200 stomates on the top of the leaf and 13,000 on the bottom of the leaf.
Transpiration is a very important plant process. When a plant transpires water, nutrients are brought from the soil via the xylem and the roots (root hair zone) to the leaves, and leaves are cooled by evaporative cooling (Figure 2).
III. The soil

The soil serves as the reservoir for moisture to be used by the plant. The amount of moisture that is available for use by a plant depends upon the texture of the soil. Soil texture refers to the proportion of the stone, gravel, sand, silt and clay in the soil. The following terms are used to express soil moisture (Figure 3).

![Diagram of soil moisture classes]

**Figure 3.** The Classes of Soil Moisture. (Adapted from Bonner and Galston, Principles of Plant Physiology, Freeman, San Francisco, 1952).
A. Field Capacity

The field capacity of a soil refers to the maximum amount of moisture that is left in the soil after surface water is drained and after the water that passes out of the soil by gravity (free water) is removed. The time it takes for the moisture content of a soil to reach field capacity usually is 1-2 days and is dependent on the soil texture.

B. Permanent Wilting Point

The moisture content of the soil when plants wilt permanently.

C. Available Soil Moisture

The amount of soil moisture between field capacity and the permanent wilting point. Water holding capacity and available soil moisture varies according to soil texture. Soils with small soil particles (clay soil) have more total surface area in a volume of soil and more available soil moisture than soils with large soil particles (sandy soil).

(The remaining portion of this article will be published in next months Vegetarian.)

(Kovach)

III. HOME VEGETABLE GARDENING

A. Know Your Minor Vegetables - Tepary bean

Tepary bean (Phaseolus acutifolius A. Gray, var. latifolium Freeman.) is known also by such other names as tepari, yori mui, pavi, and Texas bean.

This bean is little grown in Florida even in home gardens due to its adaption to more arid climates. It originated and still grows wild in Mexico and the Southwestern U.S. It was taken to Africa where plant selections were made for that area.

Wild tepary beans are viny, up to 3 m high, which reportedly run up desert shrubs. The cultivated varieties are bush types, or sometimes semi-viny, growing an average of about 30 inches high.
The trifoliate leaves are pointed and about the size of lima bean leaves. The pods are short, about 3 inches long, slightly hairy, green at first drying to a light straw color. Seeds, usually 5 or 6 per pods, vary in color but commonly are buff colored, flat, resembling a small butterbean or navy bean.

Tepary beans are best suited as dry beans. The plants are drought tolerant, but do need ample moisture for seed germination and early growth. If grown with irrigation, yields may be increased even further over non-irrigated culture.

In North Florida observation trials, the beans were planted the first of September and allowed to mature in November before the onset of cold weather. Yields were fair under the short days of this harvest period. Better yields might be expected in South Florida during the winter months which are even shorter in day-length, since the beans are daylength sensitive. However, moist atmosphere is detrimental for dry bean production, so trials have been insufficient as yet to determine how well this bean would fare under Florida's more humid climate.

At Gainesville in the Fall, bean leafrollers were the most damaging pest problem encountered. Seed inoculation is reported to be the same as for lima bean.

Tepary beans are high in protein (23-25%). They are eaten like other dry beans, first soaked, then boiled or baked. Of course, the Indians of the Southwest have developed various other uses for the beans such as bases for soups and stews and grinding for meal.

Varieties offered to home gardeners by other gardeners are Blue Tepary, Brown Tepary, Light Brown Tepary, Light Green Tepary, Papago White Tepary, Ivory Coast, and White Tepary.

(Stephens)
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