

# CITRUS PROJECT RECORD I FOR FIRST YEAR PROJECT YEAR \_\_\_\_\_



Name: \_\_\_\_\_

Mailing address: \_\_\_\_\_

Age: \_\_\_\_\_ Year in 4-H work: \_\_\_\_\_

Name of local club: \_\_\_\_\_

Local leader: \_\_\_\_\_

County Agent: \_\_\_\_\_

Florida Cooperative Extension Service  
Institute of Food and Agricultural Sciences  
University of Florida, Gainesville  
John T. Woeste, Dean for Extension

## FLORIDA 4-H CITRUS PROJECT I

### Foreword

Florida produces more citrus than any other comparable area of the world. This project is designed to give 4-H'ers an insight into citrus production and horticulture through work which can be done in the dooryard or in the field.

Some people taking this project will be familiar with the terms and practices described in this record book. Frequently, many people will find some of the terms and exercises unfamiliar. To help you become more familiar with principles and practices of citrus production, the following publications are suggested for your reference (most are available from your County Extension Agent). A glossary of terms is also included elsewhere in this record book.

1. Extension Circular 339 - *How to Grow Your Own Citrus Trees*
2. State Department of Agriculture Bulletin 177 - *The Story of Florida Citrus*
3. Extension Circular 139D - *Control of Insects and Diseases of Dooryard Citrus Trees*
4. Extension Bulletin 166C - *Citrus Fruit for the Dooryard*
5. Extension Circular 238A - *Planting and Care of Young Citrus*
6. Extension Circular 137B - *Insects and Mites of Florida Citrus*
7. Extension Circular 200 - *Control of Minor Pests of Commercial Citrus in Florida*
8. Experiment Station Bulletin 536B - *Recommended Fertilizers and Nutritional Sprays for Citrus*
9. Extension Bulletin 177B - *Know your Fertilizers and Lime*
10. Extension Circular 239A - *Soil Testing*
11. Extension Circular 282 - *Growing Potted Citrus*
12. *Florida Citrus Spray and Dust Schedule* for the current year

These publications are all available to you and should be obtained from your County Extension Agent before starting this project. Not only will the publications give you an insight into commercial citrus production, but you will need them as reference material for answering questions in the exercises inside this book.

Your County Extension Agent has other publications which may be helpful, and in most cases, will have reference books which he will let you consult for additional information.

Attendance at 4-H Junior Citrus Institute should do much to improve your "Citrus I.Q." See your Extension Agent for details on this annual summer camp.

### **IMPORTANT!!**

If you plan to sell the citrus trees that you grow, you must contact your local Division of Plant Industry representative regarding state laws on planting, propagation, and sale of plants BEFORE you start this project.

## **INTRODUCTION**

The 4-H Citrus Project, if carried three or more consecutive years to completion, will introduce you to citrus production from the planting of the seed to the setting of a young tree. In addition, by answering the questions provided at the end of each year's project record, you will learn a great deal about the care of both non-bearing and bearing citrus.

The first year's work involves the construction and planting of a seedbed and growing of young seedlings (liners).

The work for the second year involves transplanting (lining out) of the liners (seedlings) and their subsequent care. You will also learn how to bud the seedling trees.

The third year's work involves the care of the young budded tree and planting the tree in the grove or yard.

Following each section of this book are suggestions for demonstrations or exhibits at achievement days. There are also questions to be answered, records to be completed and a story to write.

## FIRST YEAR

### SELECTION OF ROOTSTOCK AND PLANTING SEEDBED

#### A. Preparing a Seedbed - (This should be done before obtaining seed)

A seed flat should be built of lightweight, sturdy lumber, and measure about 24 inches long, 20 inches wide and 8 to 10 inches deep. The flat (seedbed) should be painted to prevent rotting, and several ½ inch holes should be drilled in the bottom to provide adequate drainage. Good drainage is very important!

A layer of charcoal, gravel or other coarse material, should line the bottom of the flat to a depth of about 1½ inches. This should then be covered with ½ inch of coarse sand. The flat should then be filled with a good, rich soil to within 1 inch of the top. (Using a seed flat will allow the project to be brought inside for display at achievement days, fairs, etc. However, there is no reason why this project could not be expanded to field size with as many seedlings produced as one wished to grow).

The flat should be raised above the ground at least 1 foot (be sure to check latest Division of Plant Industry Regulations). Before planting, the soil in the flat should be sterilized by heating in a shallow pan in an oven to a temperature of 180°F. This can be measured with an ordinary meat thermometer. This heating kills weed seed, nematodes, and soil borne diseases.

#### B. Selection of Rootstock -

The first step in growing citrus trees is selection of the rootstock.

There are several citrus rootstocks currently being used in Florida and there are many more being tested. Each rootstock has certain characteristics which make it better suited to a given soil and climate than another. Some rootstocks have certain desirable qualities but may also have some objectionable qualities. There is no one rootstock with all good qualities.

Some items to consider in the selection of a rootstock are: soil type, disease and cold resistance, quality and quantity of fruit produced, etc. Below is a table of the main citrus rootstocks used in Florida and some of their characteristics:

Stock	Soil Pref.	Scion Fruit Quality	Disease Problems	Cold Tolerance	Other
Rough Lemon	Sandy	Low	Foot Rot Blight Psorosis	Poor	Good for deep sands
Sour Orange	Heavy soils	Excellent	Tristeza Psorosis	Good	Best for wet areas
Sweet Orange	Heavy well-drained	Excellent	Foot Rot Psorosis	Fair	Shallow rooted and droughty
Cleopatra Mandarin	Wide range	Good	Psorosis	Good	Best for specialty fruit
Trifoliata Orange	Heavy soils	Excellent	Exocortis Psorosis	Excellent	Often makes a small tree
Citrangle (Many varieties)	Wide range	Varies	Exocortis Psorosis	Good (for most)	Varieties vary widely

**NOTE:** Trees on all stocks are susceptible to the virus disease psorosis. Budwood should be selected from trees free of this disease.

In selecting a rootstock, choose the one with the qualities suited for the location or planting site. Talking with a citrus grower or nurseryman will be helpful.

For this project, plant at least two different rootstocks for comparison.

#### Obtaining Seed -

Winter and spring are the best times to obtain seed of the variety selected. About 2 dozen seed of each variety should be adequate for a seed flat. There are two methods of obtaining seed.

One method is to purchase them from a nurseryman or seed dealer.

A second method is to extract the seed. For this project, it is recommended that you obtain mature fruit and extract the seeds yourself. This method should give the best germination. To extract seed, first obtain mature fruit of the rootstock desired. Next, cut through the fruit halfway to the center and carefully twist the fruit apart so that the seed will not be injured and remove the seed.

For best results the seed should be planted immediately. If storage is necessary, wash the seeds in clear water and dry them in the shade on a screen. Place the seed in air-tight polyethylene bags and refrigerate (DO NOT FREEZE!). Seeds can be stored in this fashion for 4-8 weeks.

#### D. Planting the Seed -

Prepare three rows in the seed flat about five inches apart and 1½ inches deep. If the seeds have been dried, soak them in water overnight before planting. Place the seeds about one inch apart in the rows. Be sure to label each row! Planting two or more rootstock varieties in one seed flat will offer a good means of comparison. Cover the seeds with soil and water them well. The seeds should germinate in four to six weeks. During this time, the soil should remain damp but never wet—except immediately after watering.

#### E. Care of the Seedlings -

1. Fertilization - For best results, seedlings should be fertilized once per month. When they are about four inches high, they should receive their first application of mixed fertilizer. Use a 6-6-6 citrus fertilizer with minor elements added. CAUTION: Too much fertilizer may damage or kill the seedlings. For the seed flat, apply 2-3 tablespoons (spread evenly over the entire flat) in the first 3-4 applications; then gradually increase the rate to 6-8 tablespoons by the time the seedlings are 12 months old.

It is best to fertilize following a rain or irrigation *after the leaves have dried off*. Do not let fertilizer remain on the leaves or it will burn them.

You may also wish to use some of the liquid fertilizers which are available in either 6-6-6 or 8-8-8 analysis. Follow the label directions.

2. Spraying - When seedlings emerge, spray them with a fungicide (ferbam or copper) to control damp-off fungus disease. Additional sprays with a fungicide (copper, zineb, or captan) should be applied monthly. Be sure to *read the label* of the spray material for the amount to use and the precautions to take in using it. (See Extension Circular 139D).
3. Watering - The seedlings should receive about one inch of water every week either by rain or irrigation.

NOTE: One inch = about 5 gallons for the 20" x 24" flat.

4. Cultivation - Weeds should be pulled on a regular basis. If weeds are allowed to grow, the root system of the seedlings may be damaged when the weeds are pulled.

## GLOSSARY OF TERMS

- Air Pockets** - Free space around roots of newly planted trees.
- Alternate Bearing** - Production of large crops every other year.
- Anthracnose** - A fungus disease of leaves and fruit (primarily leaves) most commonly found on lemons and limes.
- Bud** - A swelling on a twig which ultimately will develop into a flower or shoot.
- Bud Sport** - A variant bud (one which produces off-type growth and/or fruit).
- Bud Stick** - Twigs with well-developed buds which can be cut for the budding operation.
- Caliper** - A device used to measure the diameter of a tree.
- Callus Formation** - A growth of protective tissue around an injury.
- Cultivation** - Tilling or "stirring" of the soil around a plant.
- Damping-off** - A fungus disease which damages and kills germinating seedlings at the soil line.
- Dormant** - Not actively growing.
- Exocortis** - A virus disease which causes small, stunted trees. Found only on infected trees on rootstocks of trifoliolate orange or trifoliolate hybrids.
- Fertilizer Analysis** - Ratio of elements in a fertilizer (example 6-6-6, 8-8-8, etc.)
- Flat** - A small, well-drained (usually wooden) container used for germinating seeds.
- Foot Rot** - A fungus disease which attacks trees near the soil line.
- Fungicide** - A chemical which will kill fungi (examples - copper, captan, zineb, ferbam, etc.)
- Germination** - Sprouting of a seed.
- Heavy Soil** - A soil with a high proportion of clay, silt, or organic matter.
- Herbicide** - Chemical weed killer.
- Insecticide** - Chemical insect killer.
- Lateral Growth** - Growth of branches away from the main trunk (parallel to the ground).
- Liners** - Small trees which are approximately one year old (from seed).
- Lining Out** - Planting young seedlings in rows about one foot apart.

**Lop** - To cut off the top.

**Phytomyces** - Small spiders which feed on leaves, fruit and twigs.

**Nematodes** - Microscopic, eel-like worms which feed on plant roots.

**Petiole** - The "stem" of a leaf.

**Propagation** - Processes used to multiply the number of; to reproduce.

**Prune** - Removal of unwanted plant parts.

**Psorosis** - A virus disease which can infect all citrus varieties, characterized by loss of vigor, bark scaling and eventual death.

**Root Bound** - Roots which are "cramped" due to overcrowding in a container.

**Rootstock** - Lower portion of a budded tree which forms the root system.

**"Runts and Bulls"** - Over-size and under-size variant seedlings in a seedbed.

**Scab** - A fungus disease of sour orange and many tangerine varieties and hybrids which damages leaves and fruit.

**Scaffold Limbs** - The major supporting limbs of a tree.

**Scales** - Small insects (usually with an armor-like cover) which feed on plant parts.

**Scion** - The above-ground portion of a budded tree.

**Seedbed** - The area used for the germination of seeds and growth of seedlings.

**Seedling** - A plant grown from seed.

**Soil Fumigation** - Chemical soil treatment to kill insects, diseases and weeds.

**Tristeza** - A virus disease of citrus which may affect trees budded on sour orange or grapefruit rootstocks.

## **SUGGESTED DEMONSTRATION AND DISPLAY IDEAS**

### **FOR YOUR CITRUS PROJECT I**

1. Removal of seeds for planting in seedbed
2. Seed treatment for storage
3. Seed planting in pots, flats, or beds
4. Proper construction of flat or bed
5. Insect identification
6. Disease identification
7. Preparation of a grove map
8. Citrus variety identification (by fruit type, leaf, growth habit, etc.)
9. Citrus fruit identification (by color, size, texture, seeds, etc.)
10. How citrus fruit is graded (what determines grades, quality)

## **CITRUS PROJECT I**

### **WRITTEN EXERCISE**

**NOTE:** Information pertaining to the questions below can be obtained from the list of references found in the foreword to this book. If you need extra pages, be sure to insert them.

**A.** Write a short paragraph about each of the following citrus pests. Be sure to point out such things as where they are found, what damage they do, how to identify them, and what chemicals could be used to control them. Include pictures where possible.

1. Purple scale
2. Chaff scale
3. Citrus snow scale
4. Florida red scale
5. Mealybug
6. Aphids
7. Citrus red mite
8. Texas citrus mite
9. 6-spotted mite
10. Rust Mite

**B.** Write a short paragraph about each of the following citrus diseases. Be sure to describe the damage, what part of the tree is damaged and what will control it. Include pictures, if available.

1. Scab
2. Melanose
3. Greasy spot
4. Sooty mold

**C.** Write a short paragraph about the following nematodes attacking citrus.

1. Citrus nematode
2. Burrowing nematode









**RECORDS - CITRUS PROJECT I**

**A. List the rootstocks you selected (for your seedbed) and why you chose them.**

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**B. Record the following information for each variety of seed planted:**

	Variety I	Variety II	Variety III
1. Seed planting date	_____	_____	_____
2. Average germination date	_____	_____	_____
3. Length of germination period	_____	_____	_____
4. Number of seeds planted	_____	_____	_____
5. Number of seedlings	_____	_____	_____

**C. Prepare a sketch of your seedbed showing the planting box, rows of seeds, and varieties planted in each row.**



**F. Keep a complete record of labor costs:**

DATE	LABOR PERFORMED (WEEDING, WATERING, ETC.)	COST
	<b>TOTAL</b>	_____

**G. Summary of costs:**

Cost of seedbed \_\_\_\_\_

Cost of seed \_\_\_\_\_

Cost of fertilizer \_\_\_\_\_

Cost of sprays, etc. \_\_\_\_\_

Cost of labor \_\_\_\_\_

**Total cost** \_\_\_\_\_

Number of liners \_\_\_\_\_

Cost per liner \_\_\_\_\_

# ACTIVITY RECORD

## CITRUS PROJECT I

Keep a list of all talks, demonstrations, exhibits that you make that are associated with your citrus project. Also list any jobs, etc., that you have in citrus.

DATE	AUDIENCE	NUMBER OF PEOPLE	SUBJECT	ACTIVITY TYPE
EXAMPLE 9/9/68	4-H Club	12	Budding	Demonstration, talks or exhibits





COOPERATIVE EXTENSION SERVICE  
UNIVERSITY OF FLORIDA  
GAINESVILLE, FLORIDA 32611-0377  
905-386-3131 or 905-386-3136

**COOPERATIVE EXTENSION WORK IN AGRICULTURE AND HOME ECONOMICS**  
**(Acts of May 8 and June 30, 1914)**  
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**and United States Department of Agriculture, Cooperating**  
**K. R. Tefertiller, Director**