

The Year of the Banana

Walter V. Jerris
Covina, California

Although for many of us, bananas were more than likely our first introduction to a tropical food, few of us have taken that initial interest to the point of actually growing them. But that is changing as we learn more about their culture through events like **CRFG's** Year of the Banana, including the fact that they are not terribly difficult to grow in California.

I've put together both well-known facts about bananas as well as some of their characteristics that are just possibly less well-known even to the fruit's aficionados.

Bananas are now a food crop grown between latitudes of 29° north and 29° south in most parts of the world. All bananas originally had seeds that

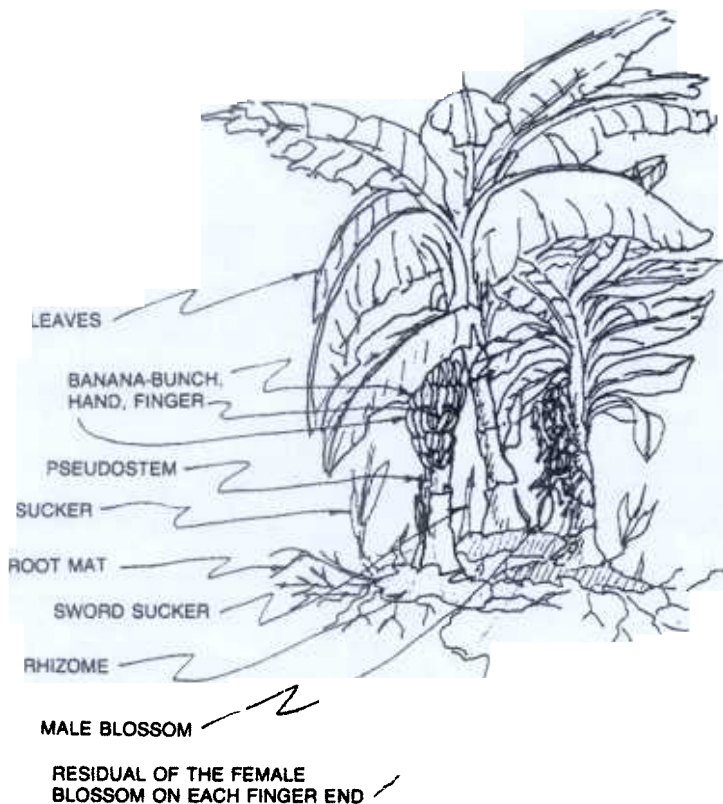


Figure 1 BANANA: *Musa acuminata* (Dwarf Cavendish/Dwarf Chinese)

were, and still are in some current bananas, very bitter. Through the ages by selection, natural hybridization and currently by planned hybridization and exposure of different varieties to each other, a modern banana was developed which is seedless and a sterile hybrid.

The characteristics of modern bananas are extremely variable. They can be divided into groups of early and late fruiting; some sweeter, some more aromatic; some moister, some dryer; some short and fat, others long and thin. They come small, medium, large and very large. Many can be eaten out of hand, while others are only palatable when cooked. Some plants are disease-resistant and others are totally destroyed when exposed to certain diseases. Unfortunately, some of the most unusual and finest-tasting bananas with many cultural features are also the most susceptible to disease damage and destruction.

Banana Basics

The material I've compiled should be useful to first-time banana-growers but it may also act as a refresher for more experienced growers. It is essentially a summation of just what a banana is and how it is structured.

The banana is an outsized, broad-leaved herbaceous perennial plant, *not* a tree. (Figure 1) The stalk is called botanically the pseudostem. The true stem is the rhizome which is under the plant as a thick, massive and starchy structure. The rhizome bears rudimentary or scale leaves which have buds on their axils. The offshoots or suckers originate from these. Unfortunately, otherwise knowledgeable commercial growers often erroneously call this structure corms, stools or a mat.

The long, fleshy cord-like roots grow primarily from the sides of the rhizome, with only a few roots coming from the bottom. Although the roots are tough, they can easily be damaged and care should be taken in transplanting offshoots (suckers). As the plants are shallow-rooted, they do best with a regular, ample and consistent watering and feeding schedule.

The pseudostem consists of the expanded leaf bases. These support the crown of the plant which is usually seven to ten feet above the ground.

The deep-green leaves are very long; from the rhizome to their tip they can be as much as 27 to 30 feet. The leaves are tender and can be shredded by winds, hail and storms. These leaves start out as pale-green growth, each in succession as it appears, rolled around its sturdy midrib. The plant often produces 35-40 leaves before it fruits.

The last leaves to be produced before fruiting are shorter. The very last

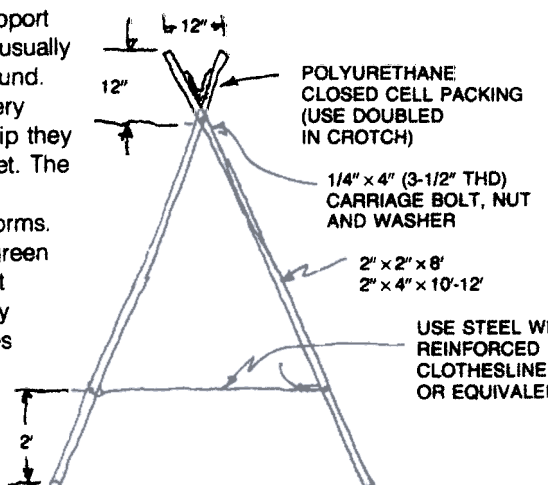


Figure 2. Prop of 2" x 2" or 2" x 4" to support heavy set banana bunches.

leaf hangs protectively over the flower bud. The short leaves on the bunch stem are actually bracts.

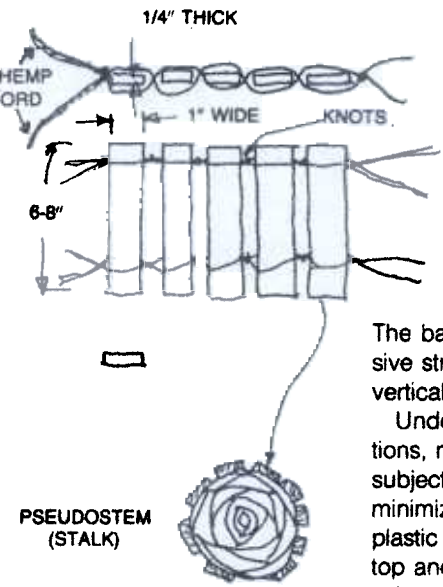
As the rhizome is the true main stem, it produces the flower buds from its growing point. From here the inflorescence is carried up right through the pseudostem to the plant top. As the flower stem grows, it develops vertically, then hangs down. The upper nodes bear male flowers at the very end. The female flowers are located in double-row spirals at the base of the bunch stem; these produce the fruit. The cultivated banana is parthenocarpic, which means that there is no pollination and the fruit is seedless.

Banana Culture

Bananas are heavy users of water and food. They thrive where the humidity is naturally high or can be induced during hot, dry periods. They do best where the rainfall is from 48 to 96 inches per year. In any area of California where the climate is adequately warm, supplemental water must be provided. On very dry, windy days, make-up moisture should be provided with mist devices and additional root water. The soil should be water retentive, but good drainage is essential. Heavy mulch (up to 10 inches) aids greatly in retention of water, keeping the roots moist and cooler.

Many bananas set very large bunches which can become very heavy. Often these same bananas have a very weak structure and the bananas must be supported by external means. I use long 2x2's or 2x4's, securely fastened with bolts when crossed about one foot from their end, creating a notch to support the fruit bunch and plant. (Figure 2)

Figure 3
DETAIL OF WRAP-AROUND PROTECTOR SLATS (LOAD DISTRIBUTORS)



An alternate to external props would be to build a wrap-around of protector slats (load distributors) (Figure 3) which can be esthetically more acceptable in a prominent viewing area. Galvanized iron guy wires attached to the wrap-around can then be staked into the ground (Figure 4) or attached to adjacent vertical pseudostems or suckers from the banana with the large bunch that needs support, as long as the sucker is vertical or nearly so (Figure 5).

The banana pseudostem has good compressive strength and as long as it can be held vertical, this support will be adequate.

Under high humidity, hot and wet conditions, many closely fruited bananas are subject to mold and spoilage. This can be minimized by using an open-ended sheet or plastic .004-.006" thick, tied at the bunch top and left open on the bottom. (Solar heat raises the internal temperature and the expanded air is exhausted through the bottom.)

Figure 3. Alternative to using external props.

Bananas, as a displaced tropical fruit in California, require a great environmental assist when grown "in site" in even the most ideal locations. In the tropics, where the banana is native, one can expect to eat bananas about nine months from when one plants the offshoot (sucker) from the rhizome.

In California, even under the most favorable semi-tropical conditions available, one should expect the time from setting the offshoot to fruiting to be from 24 to 30 months. This time-span is reduced in climates where the differential between daytime average highs and nighttime average lows is significantly reduced (both in the 70's and 80's). Even under these conditons, one must maintain a heavy watering and feeding schedule and no debilitating frost should occur during the growing, fruit-development period.

During the first year on the rhizome a robust plant can support up to three offshoots at a time. After the first plant from the rhizome has fruited and been cut out, these three plants can be grown to maturity. To insure high fruiting and high quality after the first year, it is best to allow only one offshoot to each plant rhizome.

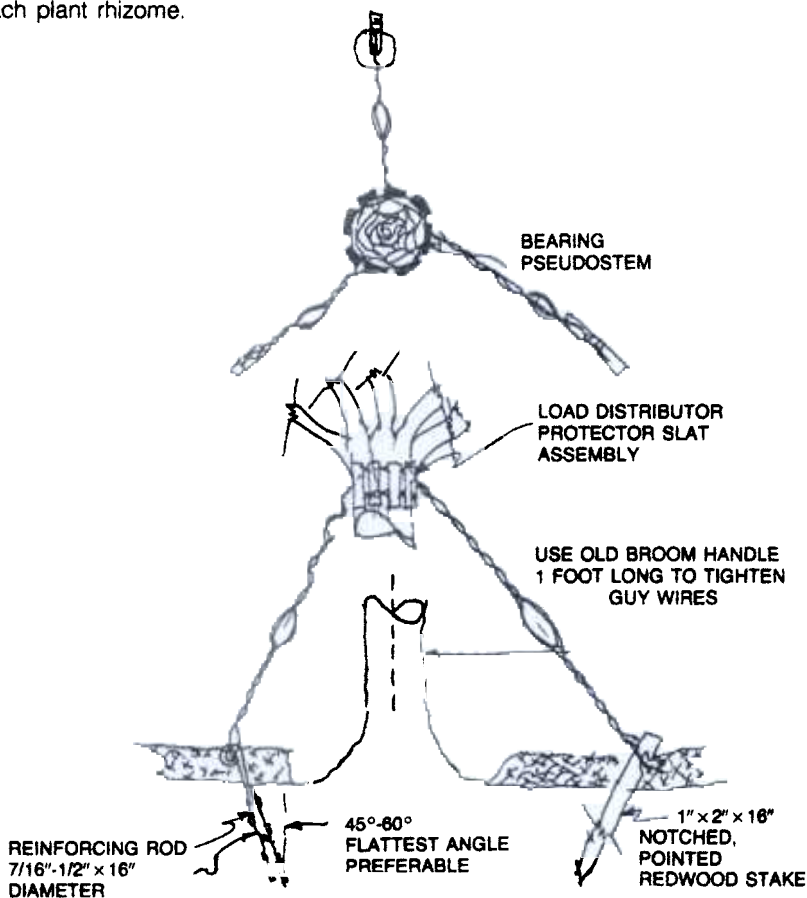


Figure 4. Alternate means of holding pseudostem vertical to obviate external wood props.

Like the date palm tree, the banana likes its feet wet or always moist, with cool roots, in well-fertilized soil and with its head in the sun. Under natural conditions, 48-96 inches of rainfall is usual.

Potassium is one of the major elements supplied by mature and ripe bananas. One should appreciate that liberal use of sulfate of potash (potassium sulfate, K_2SO_4) is a necessary part of the banana feeding program during its entire growth and development through fruiting. A good, balanced, liquid fertilizer containing nitrogen, potash and phosphates plus trace chelated elements such as iron, boron, zinc, etc. should be supplied in the form of moderate but regular feedings. An excellent source of almost all the elements needed for a properly balanced fertilizer is a *complete* barnyard fertilizer *mix* (horse, cow, pig, fowl, sheep, rabbit, etc.) Otherwise, use a commercial, water-soluble, powder-mix concentrate such as Rapid-Grow, Miracle-Gro (23-19-17) (15-30-15). These both have chelated zinc, iron, copper, manganese, boron, etc. to supply necessary trace elements. I am certain that there are others with equal credentials. For a mature banana plant in fruit, you can still use one cup (8 oz.) of calcium phosphate or

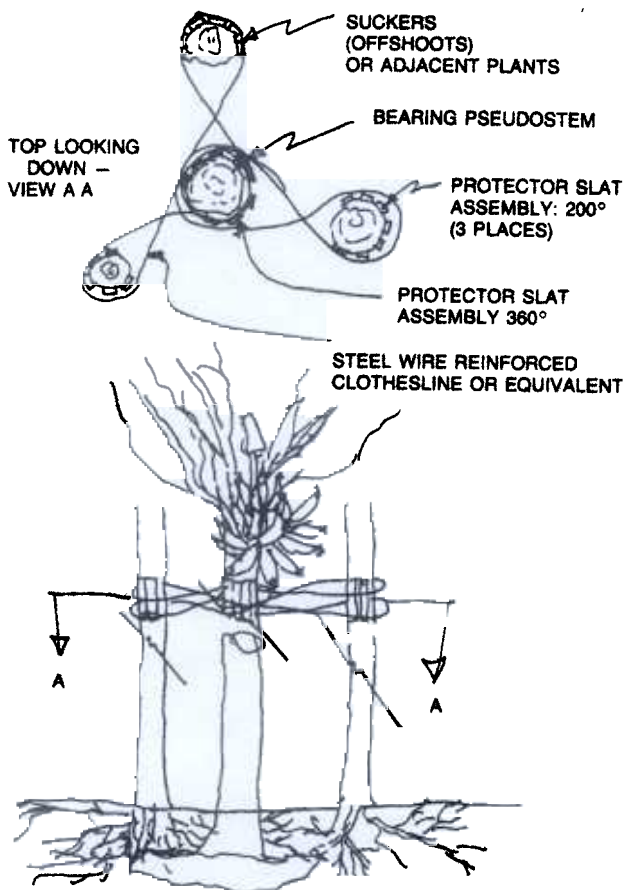


Figure 5. Usage detail wire aid.

sulfate of potash every six weeks to two months during the warmer growing months. In the winter months of December, January and February it is reasonable to put the feeding schedule on hold to reduce new growth. When early deciduous fruit trees break dormancy (usually in March), it is a good time to resume your feeding schedule. During the warmer months of maximum growth, feed schedules can be as frequent as monthly.

I usually make a mulch from coarsely shredded old banana leaves, pseudostalk waste, dusted with thin layers of lawn cuttings, and apply it from 3 up to 8-plus inches deep. Keep the mulch about 3-6 inches from the pseudostalks to minimize fungal growth. If the weather is unusually hot and humid, I further use a light dusting of soil and sulfur on each layer as it is being built up, to even further reduce fungal infection.

Longevity and Transplanting

A well-fed banana in good health and properly maintained is capable of producing quality fruit for up to 40 years. Instances of 60 years have been recorded. To remove the banana plant and place it elsewhere, I have used the following procedure to reduce or eliminate the carry-over of any built-up fungal disease. I have used the same procedure for passion fruit, too.

- 1) Dig down at least 16 to 18 inches and remove all vestiges of roots and rhizomes. Let dry out at least two months (cover with plastic if during rainy season), turning over the solid and vegetative matter weekly.

- 2) Balance your soil's pH to about 7 or neutral: for acid use lime, for alkaline use gypsum.

- 3) Lightly dust each weekly turnover with a light coat of soil and sulfur dust.

- 4) Let the plot fallow over winter.

- 5) In April check the pH, adjust again to make it neutral.

- 6) Plant your rooted young banana offshoots (they should have three to four healthy leaves on them) into soil that has been modified with one-quarter forest humus, one-quarter compost or soil-mix laced with well-rotted manure, one-half light loam plus three or four 12-quart buckets of water with the proper mix of Rapid Grow or Miracle-Gro, or if preferred, dilute manure soup.

You are now ready to see your bananas take off and grow. After about one month to six weeks, resume your regular fertilization program.

Climate Considerations

In California we have two prime adversaries against the successful raising and fruiting of bananas. They are temperature and humidity.

When one lives and plants near the ocean, humidity is seldom a problem other than during those infrequent Santa Ana wind conditions when dry air blankets the entire land mass of Southern California. Temperature, however, adequate for good year-round growing and fruit maturing often is a problem. To accommodate the latter it is well to use a hillside (south or southwest facing) as a backdrop or dense, tall plantings to create a heat pocket and maximize the temperature (Figure 6).

An opposite situation occurs when your planting is located a significant distance from the ocean. There your climate is influenced primarily by the

SUN TRAP/WIND BREAK TENDER TROPICAL SHIELD

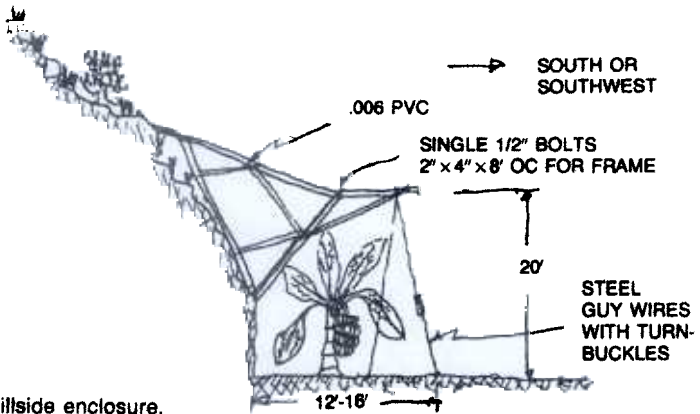


Figure 6. Hillside enclosure.

desert and you are exposed to greater extremes of both temperature and humidity.

When you are located in an intermediate valley and under the influence of desert air 30%-40% of the time, your greatest problems also continue: less than adequate humidity (supplemental system desired), at times extreme heat, or in the winter extended periods of weather below 32° F-28° F. As a practical measure, you should minimize or attempt to eliminate exposure to north, northwest and northeast wind thrust. This can be accomplished to a significant degree by orientation and by physical location. You can then further reduce the heat by using 50% to 70% plastic sun screening and reduce the wind by using .006 PVC plastic sheeting (Figure 7). During periods of extremely low humidity, misting heads on your sprinkling system (or special hardware) can be successfully used to raise the humidity to adequate levels.

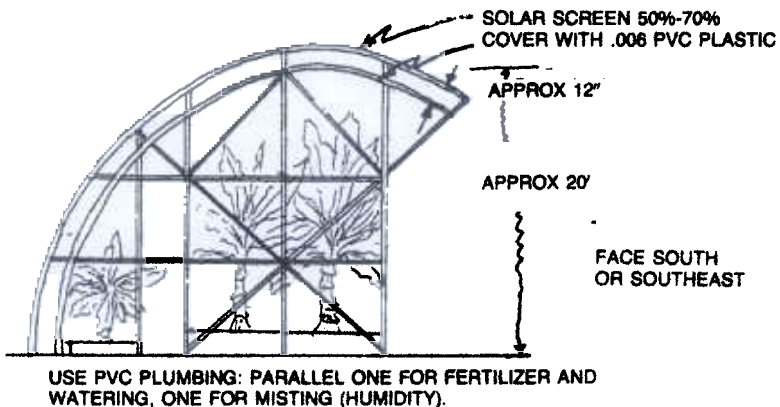


Figure 7. Free-standing sun, wind and humidity adjustable enclosure.

If you are located in the mountains or high deserts, bananas need costly environmental controls to protect against heat, wind and snow. Other rare or exotic fruit might be more practical to grow.

Separating Offshoots

Banana culture presents requirements unique to bananas, as well as those more familiar to you from having worked with other tropical plants.

Excess offshoots (suckers) must be removed: first, to reduce the load on the rhizome of the parent plant, forcing it to produce the flower stalk earlier, and second, to provide a replacement source or continuing source of new plants. As with many plants, there are specific methods to remove suckers. A clean, sharp, sturdy tool is a necessity. Preparation of the sucker, interim holding and planting hole preparation are all necessary to maximize establishment and adaptation to the new in-site location.

You will notice that the offshoots occur at random around the main banana stalk. There are two basic types of offshoots, small-leaved and sword-like configurations. Some growers prefer the sword-like offshots. I, however, feel both are acceptable if certain basic rules are followed. It is best to take the offshoots at the greatest distance from the main stalk because they are more likely to have significant root development. I prefer a very sharp trenching shovel to minimize damage when I cut the offshoot from the rhizome. I leave the offshoots exposed, for 24 to 48 hours before planting, to cool, dry or to scar over the fresh cuts. I generally plant them in 5-gal. containers prior to in-site planting. I make a loose mix of one-third compost, one-third loam and sharp sand, and one-third (mixed half and half) sphagnum moss and forest humus. I then generally water the plants with manure tea cut 6-1 with water. The plants are ready to move into the in-site location after about four full leaves have developed (indicating good root growth). This usually takes about 6-8 weeks depending on the time of year (early spring or prime growing season).

I hope that the interest the Year of the Banana has aroused will result in reports of our successes and failures in upcoming issues of **CRFG's** quarterly **FRUIT GARDENER**.