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*Agricultural Extension Circular Number 6*

*How to Thin*  
**COCONUT GROVES**

by  
**LEO MIGVAR**

DEPARTMENT OF RESOURCES AND DEVELOPMENT  
TRUST TERRITORY OF THE PACIFIC ISLANDS  
COMMONWEALTH OF THE NORTH MARIANA ISLANDS

PUBLICATIONS OFFICE, SAIPAN, MARIANA ISLANDS

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## INTRODUCTION

Most generally the greatest need for thinning of coconut groves exists on the atolls of Micronesia. It appears that many people think that the more coconut palms one has, the more coconuts will be harvested regardless of spacing. This is true only up to the point of optimum spacing of the palms which allows each coconut palm to have plenty of root room, the palms will not produce the full number of nuts that they normally could. Soil fertility also controls the number of nuts produced.

Palm counts have been made on various atolls of Micronesia revealing that there is an average of 125 to 180 palms per acre on many of the atolls. In order for the coconut palm to grow and produce many nuts, there should be no more than 75 palms per acre; this means a spacing of about 24 feet between palms.

Many people of Micronesia will not voluntarily cut down any tree that may be of some use in the future; therefore, a careful explanation of the reasons for thinning the coconut groves must be presented to the whole community. The following points should be brought out in the discussion:

1. Coconut palms will produce many nuts each year if given the chance to do so.
2. If the palms are growing too close together, there is not enough plant food for all of them to grow and produce normally.
3. The coconut palm is a sun loving plant; it needs full sunlight in order to produce nuts. (Take a look at 15-year old palms growing in the shade with no nuts being produced.)
4. Old palms, not producing nuts, are taking valuable plant food from the soil, and are also taking sunlight from other palms.
5. There are probably many young palms between five and twenty years old that show a "pencil" point condition. This type of palm will never produce very many nuts; it might as well be cut down to reduce competition for available plant food.

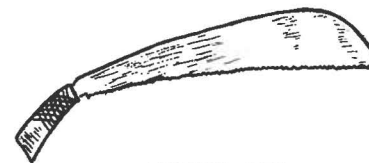
6. It is wasting plant food and sunlight to have palms growing only a few feet from breadfruit trees. There is not enough plant food and sunlight for both in the limited space.
7. Plant selected coconut seedlings only where there are empty spaces. Do not cut down a good 5 to 10 year old palm, and plant a new seedling in its place. If this 5 to 10 year old palm is given plenty of sunlight and root room it will be producing nuts in just a short time, whereas a new seedling will take six to seven years before it will produce its first nuts.
8. By proper thinning, clearing, and planting of coconut groves, copra production probably can be increased by at least one-third.
9. Where land parcels are small, cooperation of all the people is needed, especially where land parcels are in narrow strips, and each owner tends to plant coconuts as boundary markers; this practice must be discouraged through cooperation of the two land owners.
10. In communally held coconut groves, cooperation of the village leaders and all the people involved is very important if a thinning program is to succeed.
11. The cutting down and clearing of jungle and large trees in the coconut groves must also be done during thinning to reduce competition for sunlight and plant food. Some trees which will be used as building material for canoes, houses, and boats may have to be left growing.
12. Much of the pandanus on atolls need to be cut down; however, a certain number have to be left to be used for thatching, weaving, and house construction.

#### TOOLS TO DO THE JOB

To make the work of thinning easy, certain tools are needed for the job. When cutting down old, senile, nonbearing palms a large Japanese saw which is about 2 to 3 feet long does the work very well. If the community has enough money to buy a power chainsaw it does the job even faster and easier. Sometimes a chainsaw can be obtained from the District Agriculture Station. If a chainsaw is used, the operator must be properly trained in its operation and be extra careful in its use. The old coconut palms are hard and not easy to cut down with an axe. Axes and machetes are the tools to use for cutting

down the younger palms and the soft-wood trees. A Japanese saw or a chainsaw should be used to cut down the hardwood trees.

Sharp tools are essential for easy and efficient cutting of the palms and jungle trees. Flat files for sharpening axes and machetes, special files for Japanese saws, and a special file for the chainsaw should be on hand. Sometimes a steel wedge is needed to tip a tree in the proper direction and a small hammer or sledge to drive the wedge into the saw cut.



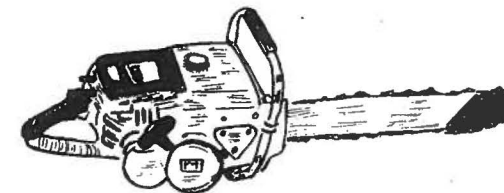
JAPANESE SAW



AXE



POISON



CHAINSAW

#### TOOLS FOR THINNING

Another recommended method of removal of old palms is the use of sodium arsenite poison. This poison is made by using 4 to 8 pounds of sodium arsenite ( $As_2O_3$ ) per gallon of water and mixing thoroughly. Then one ounce (2 tablespoons) of this solution is poured into a hole bored at the base of the palm. This much poison will kill the old palm without damaging any young palms.

Triox is an already prepared sodium arsenite solution, and is available at District Agriculture Stations.

**CAUTION:** *Arsenite is very poisonous even in small quantities; therefore, it must be carefully handled at all times. It should always be used under the direct supervision and guidance of an agriculture extension agent.*

A third method of removal of old palms is the use of 2, 4-D the common weed killer. This is also available at District Agriculture Stations. Use 45 to 50 percent strength 2, 4-D, pouring 50 ml. (3 1/2 tablespoons) of the solution into a hole bored at the base of the palm. The holes can be drilled with a hand brace using about a 3/4" diameter drill. The holes should be drilled at a downward angle so that the solution can be easily poured in and then the hole sealed with a tight fitting wooden plug. When using 2, 4-D the holes must be filled right away after they are drilled, if this is not done the sides of the hole will seal and the 2, 4-D will not be taken up by the sap of the palm.

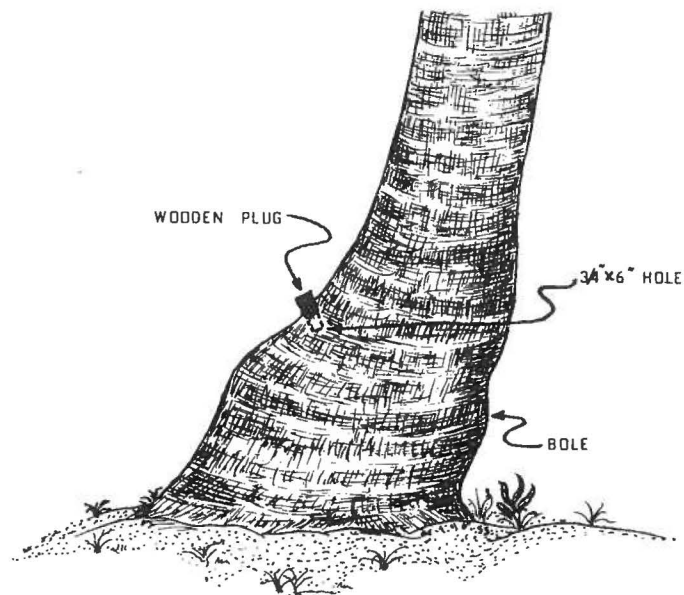


DIAGRAM SHOWS WHERE TO DRILL HOLE WHEN USING POISON  
OR 2,4-D TO KILL AN OLD PALM

## CUTTING PLAN

A thinning and cutting plan should normally proceed along the following lines:

First : Cut down or poison the old and poorly bearing palms.

Second: Cut out all the weak, poorly formed, and "pencil point" palms.

Third : Cut down large useless jungle trees, unnecessary pandanus, and breadfruit trees, the small bushes and jungle growth.

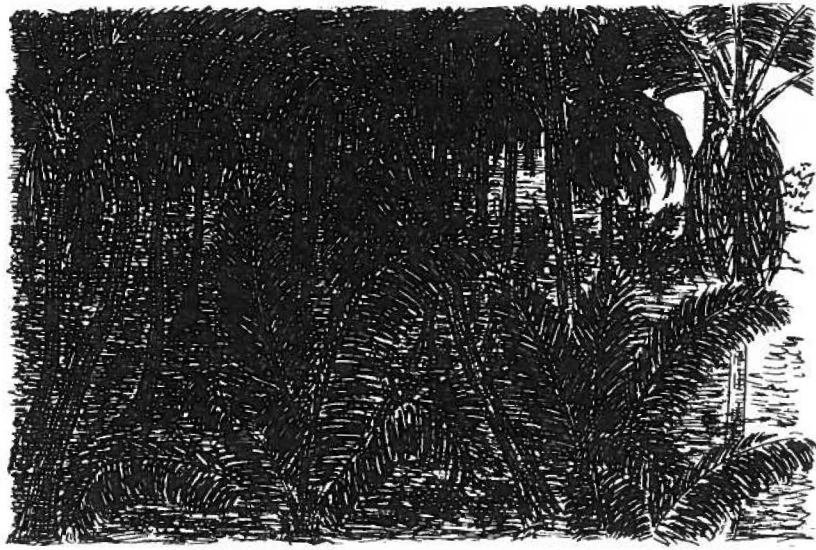
If, after all the above thinning has been done, the average space between the remaining palms is still less than 24 feet, cut down the most poorly developed palms, very young palms, and those that are very close together.

Before cutting a palm down, bear in mind the fact that the remaining palms should be more or less evenly spaced. A perfect spacing pattern is practically impossible to achieve, thus only an average scattered spacing can be expected. The supervising extension agent in charge of the thinning operations should work closely with all the workers and point out the palms and trees that should be cut down. Remember that sometimes palms that are almost ready to bear or those that are bearing only a few nuts will have to be cut down and sacrificed to give more sunlight and root room for those of better quality that remain.

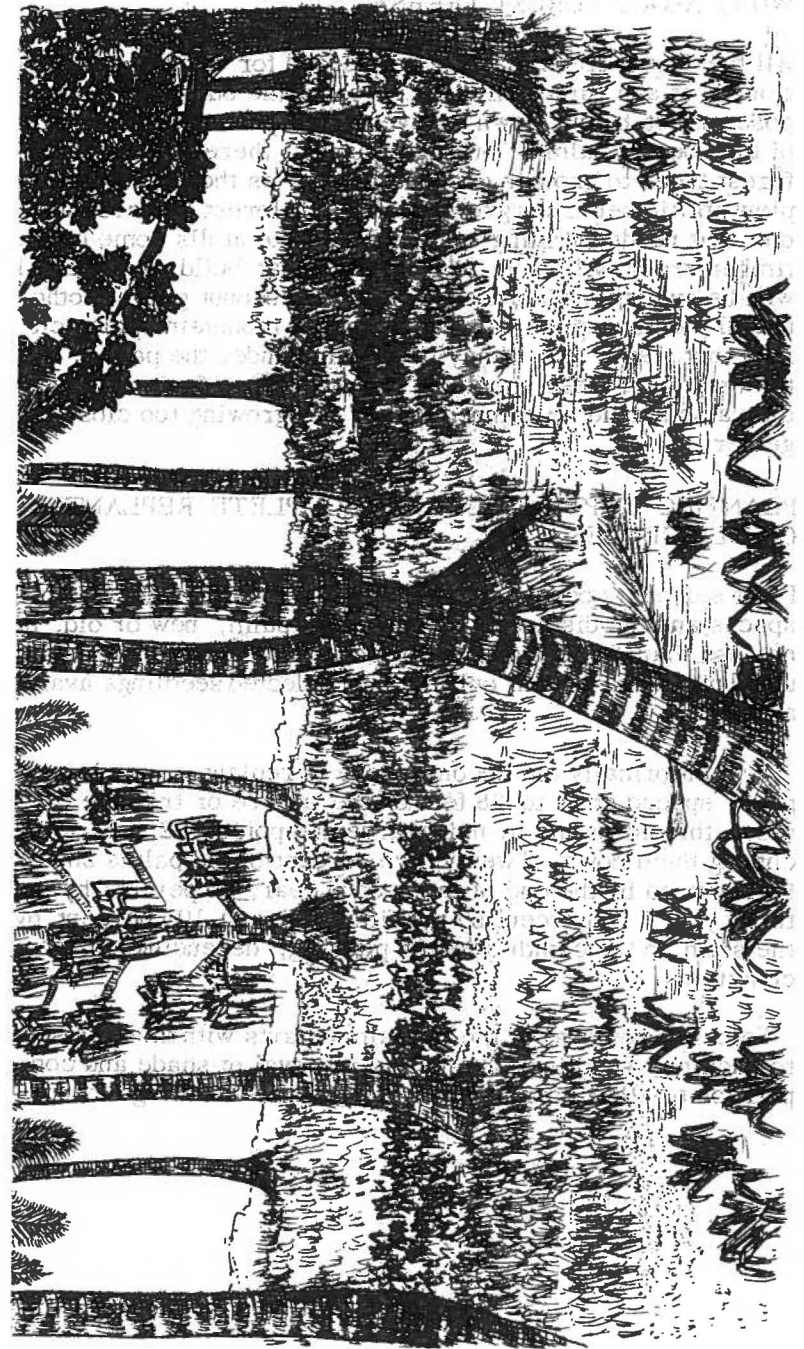
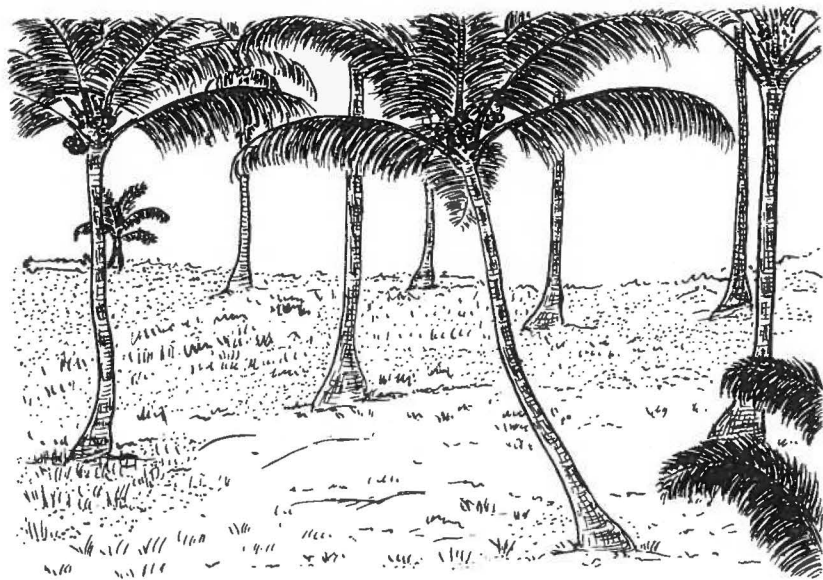
## WHAT TO DO ABOUT BREADFRUIT AND PANDANUS TREES

There are three solutions to the problem of what to do about breadfruit and pandanus trees.

1. Breadfruit can be left to grow in fairly solid stands in certain areas of the land, especially in the interior of atolls, but nearly all of it can then be removed from the balance of the coconut grove.
2. Breadfruit (or pandanus) can be intercropped throughout the coconut groves with each tree being selected and retained because of the need for fruit, timber, thatch, and weaving materials. Unnecessary trees and poor producers of fruit or timber should be cut down to give more space to coconut palms.
3. Pandanus can be grown mostly in the village area, or along the strand (beach area).



COCONUT GROVE BEFORE THINNING



COCONUT GROVE INTERCROPPED WITH BREADFRUIT AND PANDANUS WITH PLENTY OF SPACE

## WHAT ABOUT FOREST TREES?

All the forest trees that are not needed for house construction, boat and canoe building, or for some other useful purpose, must be cut down to give more space for the growth of the coconut palms. On high islands, there is no need for forest trees to grow in coconut groves, as there are usually plenty of timber trees growing on public forest lands for anyone that needs building material. On the atolls some of the timber trees will have to be left so that building material will be available when needed. In some coconut groves, other useful plants such as bananas, papaya, mountain apple, citrus, nut trees, etc., may be growing under the palms; for the most part these should be left to produce fruit, although they also should be thinned if they are growing too close together.

## PLANTING EMPTY SPACES OR COMPLETE REPLANTING OF OLD GROVES

Plant selected coconut seedlings only where there are empty spaces and the distances between each palm, new or old, is no less than 24 feet apart. Prepare the planting hole in the usual manner and plant only the best selected seedlings available.

If a uniformly old coconut grove is replanted, and is properly spaced at 24 to 28 feet on the square or triangle, remove the old palms by using arsenite poison, 2,4-D or by cutting them down. Twenty-five percent of old palms should be removed by the end of the second year, 50 percent by the third year, 75 percent by the fifth year and 100 percent by the sixth to the eighth year of planting, depending on local conditions.

Selective removal of the old palms starts with those closest to each new seedling, the idea is removal of shade and competition to allow normal growth of the new seedling.

## *Agricultural Extension Circulars - Coconut Series*

### *Coconut Series No. 1*

*The Coconut in Micronesia (Ag. Ext. Circ. No.3)*

### *Coconut Series No. 2*

*Coconut Varieties in Micronesia (Ag. Ext. Circ. No.4)*

### *Coconut Series No. 3*

*How to Thin Coconut Groves (Ag. Ext. Circ. No.6)*