RIPENING BANANAS QUICKLY

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INTRODUCTION

Many institutions, such as corrective service institutions and boarding schools are growing eating bananas to supply part of their fruit needs (see the article by Bourke, 1978). At these institutions, it is important that there are enough bananas to give all of the students, patients or prisoners at least one banana each at a meal. This means that a lot of bananas have to be ripened at once.

It can be a big problem for the institution to have ripe bananas available in large quantities at the same time. This is because natural ripening of the fruit is not uniform.

We have been doing some experiments at Aiyura to look at ways of ripening bananas quickly. This article looks at ways of ripening large quantities of banana fruit quickly and at the same time. It gives information on the use of two chemicals to ripen bananas quickly.

HOW BANANAS RIPEN

Ethylene gas is a natural ripening stimulant. It is produced by bananas during maturation and ripening. The concentration of ethylene gas increases with maturity in banana fruit. The ripening process starts when the ethylene gas reaches a certain concentration. The mainly green colour of the fruit begins to change and some yellow appears. The mature fruit start to ripen first.

There are certain factors that affect ripening of fruit. These factors are temperature, humidity and ventilation in the storage shed.

The ideal temperature to obtain fruit with good colour and flavour is between 14 and 21°C. Fruit ripened below 14°C and above 21°C have poor colour, flavour and texture. The relative humidity should be 85-90% until the first sign of ripening is observed. Otherwise the fruit lose weight and are dull in colour.

To obtain the best results, the relative humidity should be reduced to 70-75%, once the first trace of yellow colour is noticed. This should be done by ventilation if possible or the bananas should be removed to a less humid area.

If the relative humidity is allowed to remain too high during ripening, the skins of the bananas will split. The individual banana fingers will then drop off from the bunch.

The room must have some ventilation. The harvested fruit gives off a lot of carbon dioxide, which reduces the level of oxygen available for respiration (breathing). This will

slow down the rate of respiration.

As a result production of ethylene by the bananas will be slowed down. Air movement helps to spread the carbon dioxide. It will also help to lower the temperature to within an acceptable range and to reduce humidity once ripening starts.

RIPENING TECHNIQUES

There are at least two traditional ways of ripening banana fruit in Papua New Guinea. These are:

(a) Burying the bunch in a hole in the ground.

(b) People split the stalk and place a hot stone in the split. The bunch is then hung in a house to ripen.

There are other traditional ways to ripen bananas. However these may be difficult to use handling a large volume of fruit. Little work has been done on traditional techniques, so we do not have much information on them.

USING ETHREL

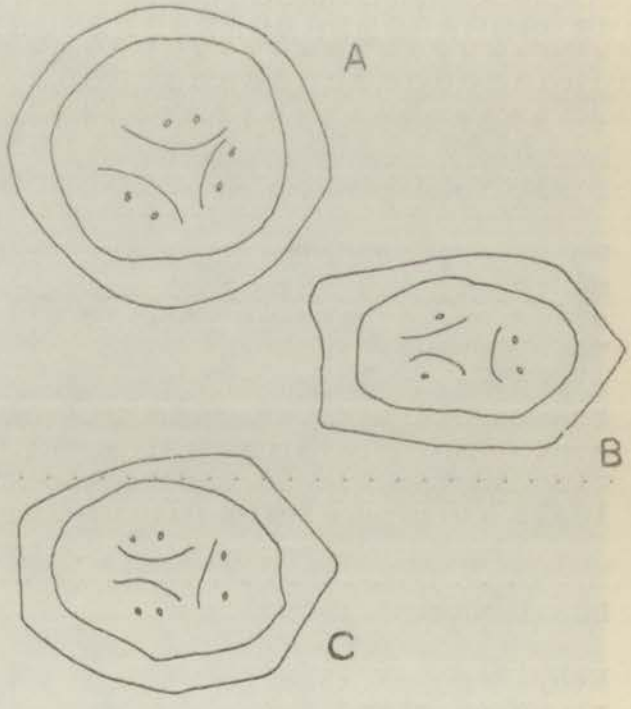
Ethrel is a chemical that has a high concentration of ethylene. A solution is made in which harvested banana fruit can be dipped before storage. The solution can be made by mixing 200 ml of ethrel in 100 litres of water.

A 200 litre (44 gallon) drum can be half filled with water and the ethrel added to this. The solution can be kept in a safe place and used to dip bananas many times.

For smaller quantities of fruits, a bucket can be used. For a 9 litre bucket, you need to mix 14 ml of ethrel in with 7 litres of water. A bucket is a convenient sized container for an individual household where a continuous supply of ripe bananas is needed.

Banana bunches should be picked when most fruit are mature (i.e. fully grown), but still green. At this stage the fruit on the top two hands of the bunch appear full and well-rounded, and they have lost their angular look. If the individual fingers are cut across they look like diagram A below, and not like diagram B.

However, if the fruit is not growing close to where it is to be used, but has to be transported some distance, it is better to pick the bunches a little earlier. The fruit will still have some angular appearance, and if fingers are cut across they look like diagram C.



Cross sections of bananas at different stages of maturity (taken from the top two hands of the bunch). A. The bunch is ready for picking. B. The bunch is not ready yet. C. The bunch should be picked at this stage if it has to be transported far.

The banana bunches should be washed in clean water before they are dipped in the solution. This is to keep the solution clean. The bunches should be dipped in the solution for 5 minutes. It is important that the bananas are completely submerged in the solution. The whole bunch can be submerged or the individual hands can be cut off first and then submerged.

The treated bunches or hands can be hung in a house or a shed. The shed must have some air movement. The ripening time depends on the temperature. In the highlands, the bunches will be fully ripe in 5 days. Fruit will ripen in 3 days in the warmer lowlands, and may take up to 8 days to ripen at higher altitudes. When the bananas start to take much longer than these times to ripen, it means that the solution is losing its effectiveness. A new solution should be made up.

A hand of green bananas is dipped in an ethrel solution to ripen the fruit. For a bucket this size, you need to mix about 14 millilitres of ethrel in 7 litres of water. The fruit should be dipped in the solution for 5 minutes. They will be ready to eat 5 days after dipping.

Ethrel solutions can be re-used to ripen bananas. However, it is very important to keep the solution as clean as possible, and free of rubbish. How long it lasts will depend on how clean the solution is kept, how often bananas are dipped, and how many bananas are dipped at a time.

USING CALCIUM CARBIDE

Calcium carbide is a rock and is available as pebbles. When this rock is soaked in water it gives off acetylene gas. Acetylene gas has a similar effect to ethylene on ripening bananas, but it is not so effective. Acetylene gas is highly inflammable so great care must be taken in using it. A cigarette or match can be very dangerous when used near calcium carbide.

To use calcium carbide to ripen bananas, place a bunch of bananas in a shed. Then 5-8 calcium carbide pebbles are wrapped in a wet cloth and placed on the floor to release acetylene gas. The gas will ripen the bananas. Banana fruit ripen between 10 and 20 days after exposure to the gas. In an experiment at Aiyura, it took over 20 days for fruit to ripen naturally.

THE NEED FOR FUNGICIDES

Harvested bananas are sometimes damaged during handling. Fungi can enter the fruit through the damaged parts and start rotting the fruit. Fungicides can be used to prevent entry of the fungi. This treatment is only helpful if it is applied within 6-12 hours after harvest. Various general purpose fungicides can be used.

Benomyl is a common one available in this country. It is sold under the trade name

Benlate. It should be used at the rate of 40-50 g Benlate/100 litres of water. When using ethrel, the fungicide can be placed in the ethrel solution. When using calcium carbide the bunches can be dipped in a fungicide solution before hanging them up.

COSTS

Ethrel can be obtained in Papua New Guinea from ICI in Lae and Shell in Port Moresby. Ethrel costs about 30 kina for a 500 ml bottle. Therefore a bucketful of solution as described above will cost around 84 toea.

Calcium carbide can be obtained from ICI in Lae. It costs about K1 per kilogram. However it can only be obtained in large drums.

CONCLUSION

There are two methods available that allow people to ripen large quantities of bananas at the same time. These are expecially useful for institutions as they need to make available many banana fruit for everyone to get a share.

It is important to keep in mind the following factors when storing treated bananas:

(a) Temperature. The room should be warm.

(b) Air movement in the room must be allowed.

(c) The room must be not very dry.

It is not necessary to go to a lot of trouble to control these factors. However things should be changed if possible so that these conditions are met.

Ethrel is easier to buy and to use. It also works faster than calcium carbide. For these reasons, we recommend ethrel rather than calcium carbide to ripen bananas quickly.

FURTHER READING

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