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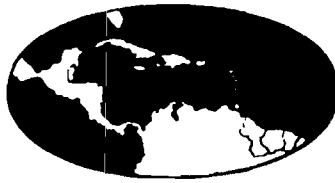
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PROCEEDINGS
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VOLUME III

THE GROWTH CYCLE OF PINEAPPLE IN THE CARIBBEAN

Claude Py et Barbier 1/

A precise knowledge of the natural growth of the plant is essential for the successful management of a plantation. When we grow pineapple for canning, fruit production should be as uniform as possible and for this reason it is not advisable to use flower inducing chemicals. They reduce yield by shortening the life cycle of the plant, as a consequence of forcing. If planting is carried out in view of exporting fresh fruit, we must know very accurately the flowering time at different locations, so that we can intervene efficiently with chemicals.

It is now admitted beyond any doubt that differences in flowering time is related to day length. At the appropriate latitude, well developed pineapple plants are favorably affected by short illumination periods, while the flowering process is slowed by this same factor when plants are underdeveloped or relatively young. In regions near the Equator, such as Guayana, where the day length varies little during the year, the differentiation of the inflorescence takes place only at the end of the short day period irrespective of the state of development of the plant; this accounts for delay in blooming as compared with places such as Martinique and Guadeloupe.

It seems that the effect of temperature is not negligible. The farther we move from the equator (or from a same locality, the higher we go) the more pronounced becomes the influence of the age of the plants on flower time. The older the plants the slower this latter process. Late flowering favors the formation of clusters of flowers.

In Martinique and in Guadeloupe a second period of uneven flowering takes place in May and June on well developed plants; but were plants are not sufficiently developed, it takes place in November to December to allow any differentiation in their flowering time. This accounts for the few fruits available at the end of the year.

The time necessary for a pineapple to grow strong enough to resist outside influences on the environment, the original reserves in the propagating material, and its genetic make up. In Guayana differences in flowering time are rather slight. When they occur in spring they are due to changes in the moisture content of the soil. In general, suckers respond earlier to environmental stimuli than slips, and slips earlier than crowns.

There is also ample proof that we can obtain a fruit set that is well grouped together at the average elevation of 200 to 300 meters which is considered optimal in Martinique and Guadeloupe

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Presented by J. Le Bourdelles.

under average conditions without resorting to the new technique of cultivation on banks under polyethylene film and without the use of flower-inducing substances. We plant small suckers at the end of the year from September to January, medium size suckers at the beginning of the year from January to March, and large size suckers from April to July. All of them reached a sufficient stage of development during the next short day period. In fact, from December to January we may use quite a large range of planting material. Crowns may behave like small suckers but they are affected more slowly by external factors that induce uneven flowering. They may follow the same growth cycle as the suckers if planted few months earlier in June. The cycle lasts for 24 months. Slips may be considered like small size suckers; they must be planted a little later than the crowns.

Results of fields experiments are shown in figure 1 evaluating planting time against weight of planted material. We see the different weights to use in order to obtain a uniform harvest. This represent the pineapple cycle for one particular region. If planted materials are thicker than indicated in the diagram the use of the flowering induce chemicals is essential at the end of June at the latest. If we use material thinner than that indicated in figure 1 we may have a partial differentiation of the inflorescence, the smaller the size of the fruits.

When flowering is gradual, due to ecological conditions the growth cycle increases as it happens in Guyana. In such a case the use of flowering inducing substances are a necessity.

In figure 1, is the results of a trial conducted in Guadeloupe. It was planted at four different months: October, January, April and July, and sampled every two months, from the fourth month after planting using 23 "D" leaved for each individual plot. The quantity of leaves, emitted by the plant between every leaf sampling was counted. Total leaf weight was calculated by multiplying the average weight of the D leaves by the quantity of new leaves found during the previous sampling. An arrow on the figure indicates the period of the maximum lowers production.

Figure 2 corresponding to a plantation of January of three types of suckers (300, 500, 700 grams \pm 100 grams) are indicated by the percentage of cumulated blooming. Observations of the appearance of inflorescences were made every week. This figure corresponding to the January plantation shows conclusively the importance of the blooming at the beginning of the year with 95 and 80 of which came out in January and February.

SUMMARY

Exact knowledge of the growth cycle is important in the growing of pineapple when the production is to be used for canning and also when it is destined for fresh consumption export. For canning we like to have the production come in all at one time and we like to avoid the use of flower inducing chemicals since they tend to reduce

FIGURE 1

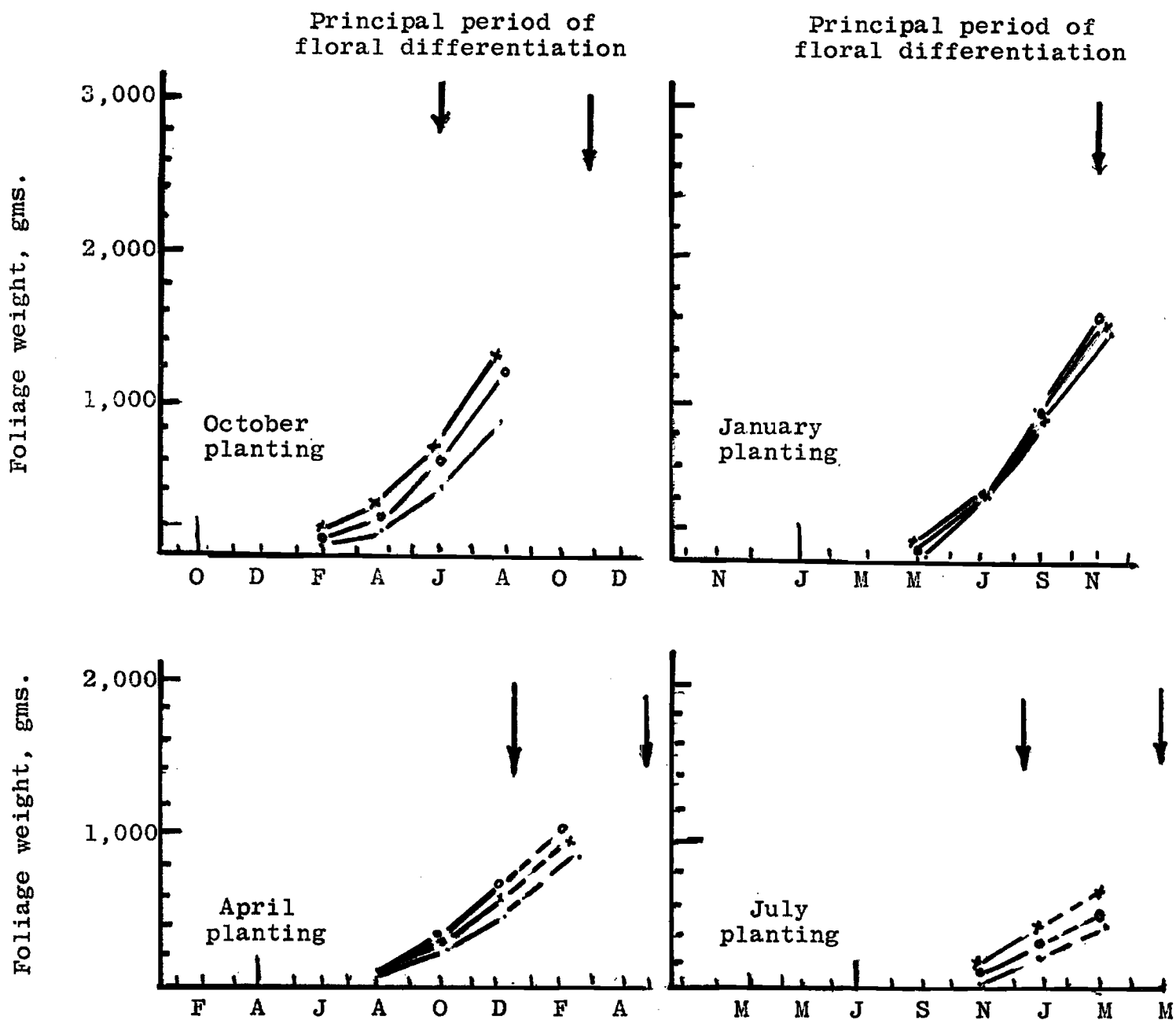


Fig. 1. - Influence of time of planting and weight of planted material on floral differentiation in pineapple for Guadeloupe.

- x—x Suckers, 300 g. ± 100 gms.
- o—o Suckers, 500 g. ± 100 gms.
- .— . Suckers, 700 g. ± 100 gms.

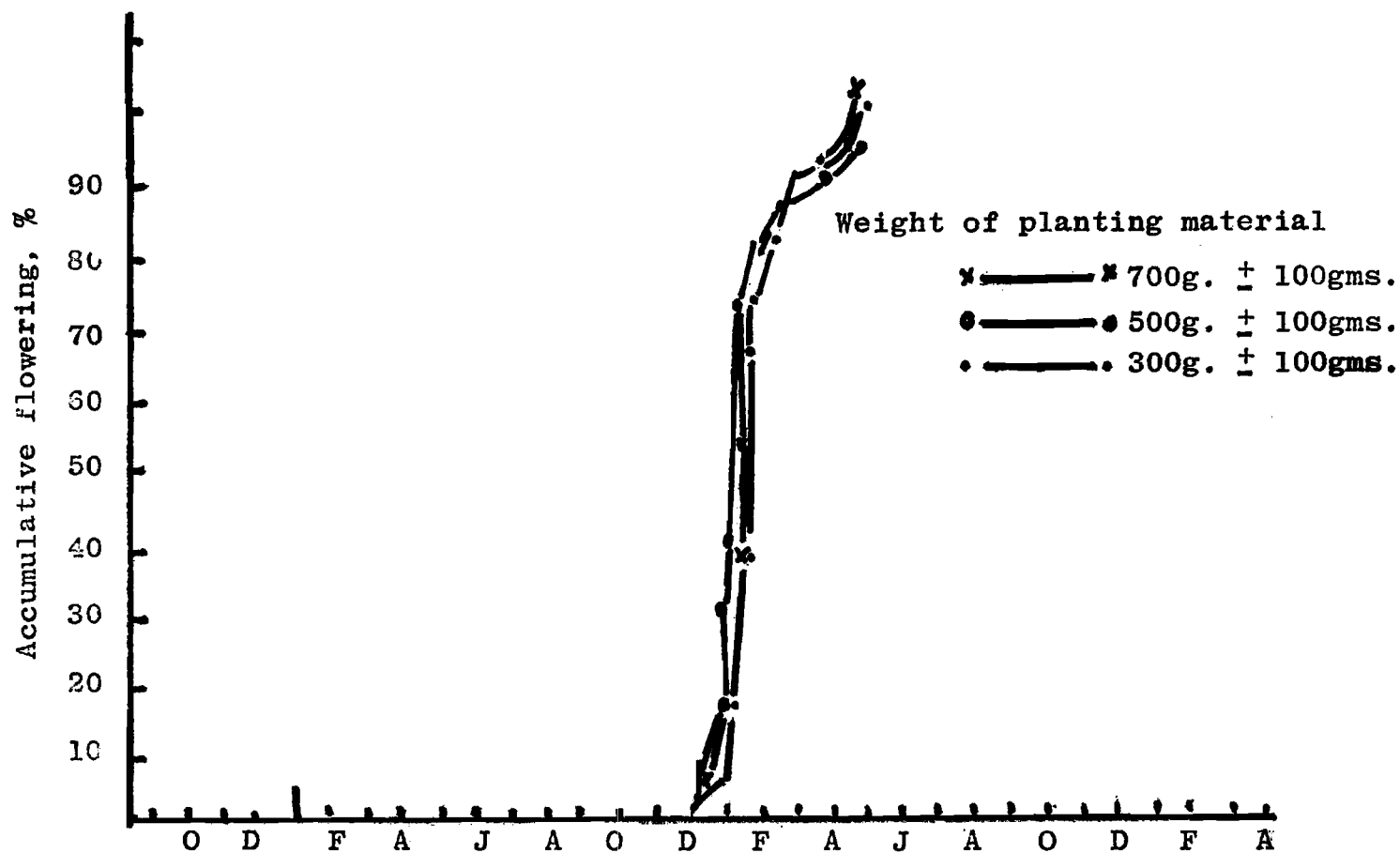


Fig. 2. - The influence of the weight of the plant material on the accumulated blooming percentage of pineapple for a January planting.

production. For fresh consumption we like to know when is the correct time to intervene with chemicals so that the harvesting coincides with the desired time of export.

A number of experiments were initiated by the "Institut Francais de Recherches Fruitières Outre Mer", on the islands of Guadeloupe and Martinique and in Guayana. The variables considered were: the use of different parts of the pineapple plant as propagating material, elevation, weight of seed pieces, time of planting and the use of chemicals or special cultivation methods to induce flowering.

It is concluded that the differentiation of the inflorescences is definitely influenced by the length of day.

At the appropriate latitude the differentiation occurs progressively "earlier" (at the beginning of the period with short days) when the plants are little developed. It occurs "late" (at the end of the period with short days) when the plants are little developed or relatively well developed but young (planted with large seed pieces).

In tropical regions close to the equator, such as Guayana, where the daylength varies little during the year, the differentiation of the inflorescences takes place only at the end of the short day period irrespective of the state of development of the plant. The temperature seems to have a similar effect because the farther one gets away from the equator, and if one stays at the same latitude, the developed for them to flower.

In general, suckers respond earlier to environmental stimuli than slips, and slips earlier than crowns.

Also, evidence indicates that it is possible to obtain a fruit set that is well grouped together, as the average elevation of 200-300 meters, which is considered optimal in Martinique and Guadeloupe, under average conditions without resorting to the new technique of cultivation on banks under polyethylene film and without the use of flower inducing substances. This was observed when small suckers were planted from September to January, medium size suckers from January to March and when large size suckers were planted from April to July.