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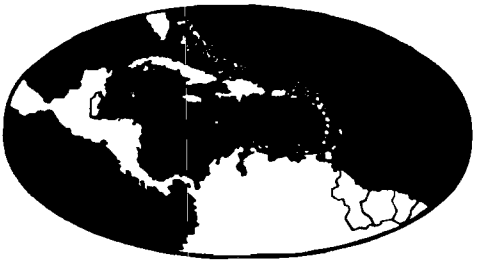

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STUDIES FOR SEEDS CONSERVATION OF PIGEON PEA (*C. CAJAN*) AND COWPEA (*V. UNGUICULATA*)

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SUMMARY

In ordinary conditions, seeds of Pigeon pea (*C. cajan*) and Cowpea (*V. unguiculata*) lost their germination ability within one year. From the 4th month after harvest this ability falls quickly. The utilisation of a domestic air conditioner or a cold room permits the disposal of good seeds over one year. The cold room at 6-12°C seems able to increase the period of viability by one additional year.

INTRODUCTION

Pigeon pea and Cowpea were specially studied by M. Derieux (1969 a, 1969 b, 1971 a, 1971 b) as part of a general investigation of the leguminous plants that can be used in Guadeloupe.

The need for collecting and storing such varieties necessitated studies on the duration of the viability of the seeds.

Little information on this is available though Roberts (1972) mentions for *V. unguiculata* the effects of alternate soaking and drying on germination. We have found nothing in the literature of this area in spite of the increasing interest shown to Pigeon pea from Gooding's restatement (1960, 1962) to the recent prospects called up by Cropper and Arzu (1974) for instance.

MATERIAL AND METHODS

The experimental design was recommended by D. Lor. It was set for the variety "GI 54.3.2" of Pigeon Pea and the "Dixielee" variety of cowpea. "GI 54.3.2" is a determined semi-dwarf type developed from a well known selection of the Faculty of Agriculture of the University of the West Indies (Trinidad). "Dixielee" is a north American variety widely distrubuted and selected in a Mississippi Station.

In both cases, the harvested seeds previously tested for moisture and % germination were put in plastic flasks of 50 cc sealed by an adhesive strip. In this way, three conditions of conservation could be evaluated at Duclos.

	Temperature (°C)	% Relative humidity
A/ Ordinary Laboratory room	24-29	75-95
B/ Room with a domestic air conditioner	18-20	80
C/ Cold room (furnished with an electric dehumidifier)	6-12	75-85

For the Pigeon pea, the Experimental Station of St.-Francois in a comparatively dry part of Guadeloupe permitted a variation of the ordinary laboratory conditions being slightly warmer (25 - 30°C) and less humid (70 to 85%).

Every month, a flask of each treatment was opened and 5 x 10 seeds were set for germination at the rate of 10 seeds per Petri-dish. The numbering of the seeds which put out their primary root was done after 4 days. The estimates expressed as percentage is shown on a graph.

RESULTS

I. Pigeon pea

The seeds resulted from a harvest done on the 24-3-72 at St. Francois and had 12.5 percent of humidity at the outset. The essential data drawn from the curves (graph 1) are as follows:

1% Under normal laboratory conditions 0 germination falls from the beginning in a nearly rectilinear way (save on fluctuations) to 50% after 5 or 6 months and reaches zero after 10 - 11 months.

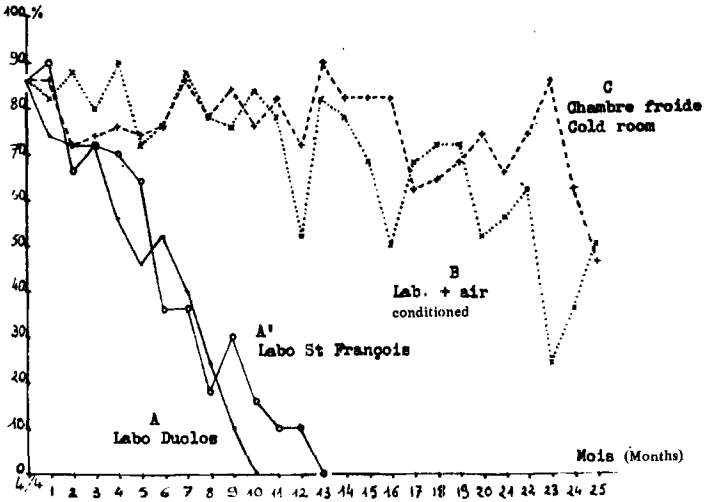
2% In a controlled atmosphere (B and C) the 0 germination remains approximately constant until about the 12 month.

3% From the 12th month, the medium C (the coldest) is superior over the medium B, but not statistically significant.

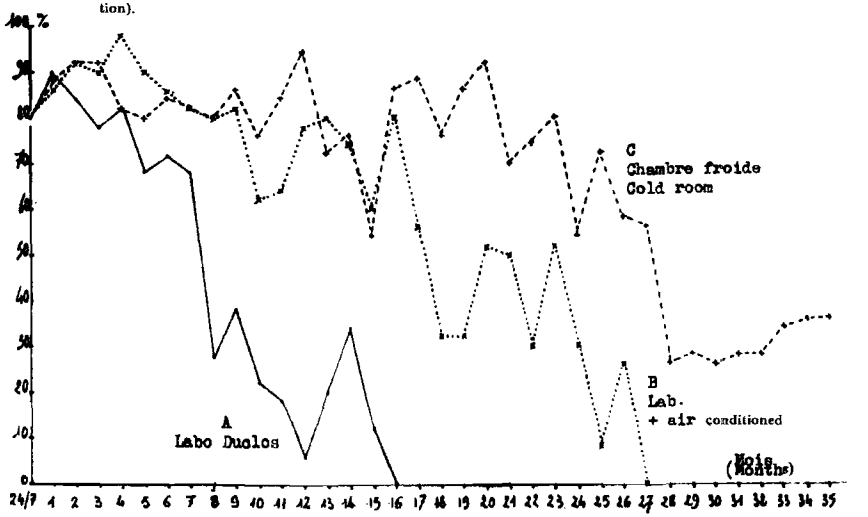
It is observed in both cases that the duration of viability of Pigeon pea seeds has been nearly increased threefold.

II. Cowpea

The seeds were harvested at Domaine Duclos on the 3-6-71 and had 14% of humidity. The important fluctuations of the values of each series are nearly unimportant, considering the very great differences of evolution of the three series of measure (graph 2).



Gr. 1. Germination du Pois d'Angole suivant la duree et les conditions de conservation (Pigeon pea germination according to duration and condition of conservation).



Gr. 2. Germination de *Vigna ungiculata* suivant la duree et les conditions de conservation (*V. ungiculata* germination according to duration and condition of conservation).

action with the surrounding parasitic flora (fungus, bacteria) the development of which could alter some results, would have been measured. In fact, these preliminary studies were done in a voluntary simple methodology for the feasibility of the execution, the rapid obtainment of practical results, and as a guide to more extensive studies.

A thorough study could consist in regular sowings in the field throughout year parallel with disease free germination in controlled microclimatic conditions with a scale of varieties of each of the species. The initial rate of germination and its evolution can be, indeed, varietal characters, as have been seen in *Panicum maximum* (Degras, Felicite and Mathurin, 1971).

RESUMEN

ESTUDIOS PARA LA CONSERVACION DE SEMILLAS DEL GANDUL (*Cajanus cajan*) Y DEL CHICHARO DE VACA (*Vigna ungiculata;*

En condiciones comunes, las semillas de gandul (*C. cajan*) y de chicharo de vaca (*V. ungiculata*) pierden totalmente su facultad germinativa al cabo de un ano. Desde el cuarto mes despues de la cosecha, este poder diminuye rapidamente. El empleo de un condicionador (domestico) de aire o de una camara fria permite de tener semillas satisfactorias todovia al cabo de un ano. La camara fria a 6-12°C parece capaz de doblar esta duracion de conservacion.

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1% In ordinary condition, the viability of the seeds decreases for the first few months until it crosses the threshold of the 50% from the 8th month and becomes nil toward the 16th month.

2% Before this 16th month, the two other conditions of storage are roughly equivalent and are plainly higher than 50% germination.

3% From the 16th month, the superiority of the storage in a cold room is obvious. It is only after the 26th month that the germination becomes below 50% in these conditions while at the end of the same time, the viability becomes nil for the seeds kept in an air-conditioned laboratory.

It was observed that at the end of the experiment the seeds kept in the cold room shows 30% germination. Therefore, the conservation of the seeds of this variety of *V. unguiculata* can be extended to 2 years.

DISCUSSION

These studies show the extreme precariousness of the seeds value in natural conditions for *C. cajan* and *V. unguiculata*. Beyond 3 or 4 months after the harvest, their viability can be considered as low and nil beyond a year. The sowing of these two species, one year out of two, which is very desirable for an economy in storage structures (air conditioned).

For the Pigeon pea, a low frequency of the sowing of a collection is desirable for a further reason:- the often high rate of cross-fertilization (Derieux, 1971 b) gives way quickly to a damage of the varietal character. With *Vigna ungiculata,* the short duration of the production cycle of numerous variety (about 3 months) already makes hazardous the practice of unique yearly sowing without a special condition of storage, the interval between the harvest and the new sowing leading then to a viability very inferior to 50%.

For both species the seed conservation in a controlled air conditioned atmosphere (controlled temperature and moisture) keeps the % germination about 50% for at least one year. Due to the method used it is difficult to make meaningful comparisons between the air conditioned storage and cold room storage especially for *Cajanus cajan*. With *Vigna ungiculata*, however, cold room storage definitely gives longer storage life (i.e. seeds remain viable for longer periods).

The experimentation would have been more valuable with a careful disinfection of seeds after harvest and the sterilization of the material of germination. The evaluation of the viability without inter-

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