

FIELD BEHAVIOUR OF YAM (*DIOSCOREA ALATA* L.) FROM
IN VITRO CULTURE, IN STAGGERED PLANTINGS

(*Comportement au champ d'igname (D. alata L.) issu de
culture in vitro en plantations échelonnées*)

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SUMMARY

Tissue culture of *D. alata* cv Lupias, supplies in all seasons plantlets of which morphology and development patterns present some similarities with seedlings of closely related species.

Plantings, irrigated and staggered between september and april show that later behaviour of those plantlets depends on planting season. Two effects are observed :

On one hand a reduction of maximum development attained by aerial and underground parts after planting under short or decreasing days ; on the other hand a certain regrouping of dieback dates of aerial parts for all plantings and a regrouping still more drastic of sprouting dates.

The first effect brings about a yield reduction as compared to april planting, sensitive since september and very severe from october to december plantings. The second effect annihilated since next year the initial temporal shift induced by out of season planting. The results are very close of those obtained generally with staggered plantings from yam tubers of *D. alata* presenting signs more or less accused of ageing. As they cannot be here attributed to the mother tuber, we conclude that the difficulty of out of season cultivation of that species is due to a great sensitiveness to environmental factors, (thermo-photo-periodism).

RESUME

La culture *in vitro* de *D. alata* cv. "Lupias" fournit en toute saison des jeunes plantes dont la morphologie et le mode de développement initial sont proches des caractéristiques des jeunes semis d'espèces voisines. Des plantations irriguées échelonnées entre septembre et avril montrent que le comportement ultérieur de ces vitroplants dépend de la saison de plantation. On observe deux effets : d'une part une réduction des développements maximaux atteints par la partie aérienne et la partie souterraine après plantation en conditions de jours courts ou décroissants (la partie souterraine étant relativement moins affectée que la partie aérienne) ; d'autre part un certain regroupement des dates de fanaison de la partie aérienne de toutes les plantations, et un regroupement encore plus net des dates de germination. Le premier effet occasionne une diminution du rendement par rapport à la plantation d'avril, sensible dès la plantation de septembre et très sévère pour les plantations d'octobre à décembre. Le deuxième effet annule dès l'année suivante le décalage temporel initial conféré par la plantation hors saison. Ces résultats sont très voisins de ceux généralement obtenus avec des plantations échelonnées de tubercules de *D. alata* présentant des signes plus ou moins nets de vieillissement. Comme ils ne peuvent, ici, être attribués au tubercule-mère, on en conclut que la difficulté de cultiver cette espèce hors-saison provient principalement d'une grande sensibilité aux facteurs du milieu (thermo-photopériode).

INTRODUCTION

In respect of out-of-season production, *Dioscorea alata* has been the most studied species among cultivated yams. Using chemicals, CAMPBELL et al (1962) shortened the tuber rest period and could plant sets from January to June in Trinidad : neither yield nor growing period were altered. On the other hand, all the experiments of delayed planting revealed that sets planted from July to November had lesser yield and reduced growing period, irrespective of the means used to store the planting material : chemicals (GOODING and HOAD, 1967), disbudding (CLAIRON and ZINSOU, 1980), cooled storage (ARNOLIN, 1981). The subsequent rest period may (CLAIRON and ZINSOU, 1980), or may not (ARNOLIN, 1981), also be shortened so that sprouting occurs at the normal date the following year. When planted in December or January (storage time > 1 year), the sets have "anarchic" (ARNOLIN, 1981) vegetative durations. At last, planting later than January (storage time - 1 year) leads to vigorous plants with normal vegetative cycles (ARNOLIN, 1981 ; MATHURIN, 1982).

From all those reports the behaviour of *D. alata* appears very dependent on the planting date. However it must be pointed out that they are all derived from the use of aged tubers as planting material, so that those results may have two different origins : an internal factor (the ageing of the tuber) and an environmental factor.