matter content of the tubers and to enhance their storage.

## Results and discussion

The analysis of variance performed on the data showed that variety and mulch effects were significant ($P<.05$) for the traits measured while there was no variety by mulch interaction.

**Table 1: Mean establishment and fresh tuber yield (kg) of two varieties of yam**

| Variety | No. of plants established | Fresh tuber weight (kg) |
|---|---|---|
| TDr 179 | 36.8a | 12.5a |
| TDr 747 | 34.2b | 14.6b |
| LSD $_{(0.05)}$ | 2.2 | 1.2 |

TDr 179 exhibited better plant establishment than TDr 747 but tuber yield was still higher in the latter (Table 1).

The plant establishment of the two varieties was significantly higher under palm fronds than under plastic mulch (Table 2). This was possible since it was noticed that some yam shoots had problems coming through the perforations on the plastic mulch. Rather, such shoots grew under the plastic and must have died after some time. In addition, the rains were not very frequent just after transplanting and the heat generated by the plastic mulch particularly in the hot afternoons may have caused some young shoots to die off. Table 2 shows no significant difference between the two mulches with respect to fresh tuber yield. Considering the poorer establishment on plastic mulch this suggests a higher tuber yield per stand using that mulch. However, the absence of a significant difference in overall yield is a good indication that palm fronds and perhaps maize, sorghum and grass straws could serve as suitable alternatives to plastic mulch in the production of seedyams.

**Table 2: Mean establishment and fresh tuber yield (kg) under two types of mulch**

| Mulch | No. of plants established | Fresh tuber weight (kg) |
|---|---|---|
| Plastic mulch | 33.3a | 13.7a |
| Palm frond | 37.7b | 13.4a |
| LSD $_{(0.05)}$ | 2.7 | 1.4 |

**Note: Means with common letter within a column are not significantly different**

These findings promise a useful alternative mulch and will be retested in a larger experiment involving other locally available materials.

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## Hybridization of yams: a mini-review


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Yams (*Dioscorea* spp.) are an important food crop in West and Central Africa, the Carribean and parts of Asia and Latin America. The traditional constraints to yam production include high cost of labor input for mounding/ridging and staking, shortage and high cost of planting materials, diseases (e.g. viruses, anthracnose) and pests (e.g. nematodes, beetles and mealybugs). In their efforts at improving on the situation the few yam breeding programs reported in the literature have relied on selections from landraces and hybridization of genotypes within and between species (Sadik and Okereke 1975, Akoroda 1985a, Doku 1985, Abraham et al. 1986). The principal obstacles encountered in sexual hybridization of yams have included the paucity of flowering, rarity of females, poor synchronization of male and female flowering phases and lack of efficient pollination mechanisms (Abraham et al. 1987).

### Flower biology

There is a range from nonflowering to profuse flowering among genotypes of the commonly cultivated species of yams. Flowering genotypes of species like *D. alata*, *D. bulbifera*, *D. cayenensis* and *D. rotundata* are generally dioecious but Sadik and Okereke (1975) reported occurrence of complete flowers on *D. rotundata*. Monoecious genotypes have been recorded in *D. rotundata* at IITA over the

### Fifth ISTRC-AB Symposium in Uganda

The International Society for Tropical Root Crops—Africa Branch (ISTRC-AB) will hold its fifth triennial symposium in Kampala, Uganda, from 22 to 28 November 1992. The theme of the symposium will be " Root Crops for Food Security in Africa". A second announcement has been sent out to those who have indicated their intention to attend the meeting. Abstracts and full papers should reach the Acting Secretary by 15 September and 15 October 1992, respectively.

years. Akoroda (1985) reported inferiority of pollen from bisexual flowers on monoecious plants compared to pollen from unisexual flowers from dioecious plants of this species. Female flowers tend to be more limited than male especially for *D. alata* and *D. cayenensis* (Martin 1976) and sterility is quite common. Akoroda (1985a) reported a range of in vitro pollen germination from 0.3% to 85% for *D. rotundata*. Vijaya Bai and Jos (1986) reported pollen fertility range of 20% to 98% for some genotypes of *D. alata*.

In Nigeria, flowering occurs between June and September. Flowering intensity, fruit set and seed set are influenced by shoot vigor which in turn depends on factors like initial tuber set size, plant health status, and leafiness (Akoroda 1983a, 1985b ) in interaction with edaphoclimatic factors. The effects of soil moisture, atmospheric humidity, and soil fertility on the initiation, intensity and duration of flowering were noted by Vijaya Bai and Jos (1986).

Nair et al. (1987) reported anthesis from 9.30 to 11.30h for males and 9.00 to 12.00h for females of *D. rotundata* at Trivandrum in India. Anther dehiscence occurred either at anthesis or an hour before. At the same location Vijaya Bai and Jos (1986) recorded anthesis of both males and females from about 14.00h for *D. alata*. The male flowers remained open till about 17.00h. The peak time of male flower opening in three clones of *D. cayenensis* in Nigeria was shortly before noon and declined to 13.00h (Akoroda 1984).

## Hybridization

Establishment of nurseries using seeds collected from the wild and/or farmers fields has been a regular activity of many breeding programs (Doku 1985). Crossing blocks are also set up for clones with desired characteristics and reasonable regularity and intensity of flowering. If some natural hybridization is desired then, close proximity of the desired male and female parents is critical as the major pollinating insects (thrips) are quite inefficient (Akoroda 1983, 1985a; Vijaya Bai and Jos 1986). Akoroda (1983) reported three times greater fruit set from hand pollination compared to insect pollination.

A series of planting dates of the parental clones is recommended to ensure synchronization of flowering of males and females unless their flowering behavior in the particular environment is well known. However, storage of pollen from *D. rotundata* in viable condition at 0% relative humidity and -5°C up to one year has been demonstrated (Akoroda 1984). This has the potential to resolve the nonoverlapping of male and female flowering phases.

Artificial pollination involves the excision of tiny anthers from small male flowers using the fine point of a lead pencil (Nair et al. 1985), pin or splinter (Akoroda 1985a) and their deposition on a stigma with a gentle rub. Akoroda (1983) recommended pollination of mature female flowers within a week after bagging using pollen from open male flowers collected around 14.00h. Abraham et al. (1986) reported fruit set of 65.9% and 70.9%, and seed set of 45.0% and 54.0%, respectively from crosses between *D. alata* clones Da 140 and Da 164 (females) and Da 60 (male). It should be noted, however, that failure of fruit set is quite a common occurrence. Pollinations early in the flowering season have been found to be most successful (Akoroda 1985a) and the use of pollen from diverse genotypes has been recommended as a means of overcoming variability in pollen viability among genotypes.

## Looking ahead

There are efforts in progress in advanced laboratories aimed at somatic embryogenesis, somatic hybridization and genetic transformation of yams. The emerging close collaboration between such programs and the conventional improvement programs certainly sets the stage for greater achievements in the near future and beyond.

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