

## MASAKWA DRY SEASON CROPPING IN THE CHAD BASIN

Barbara Zach, Holger Kirscht, Doris Löhr,  
Katharina Neumann and Editha Platte

### Introduction

*Sorghum bicolor* is the fifth most important cereal crop in the world (FAO 1994). Sorghum is grown in the subtropics and tropics, and in Africa it is cultivated from the southern edge of the Sahara down to the savanna regions of South Africa, only excluding the rain forest area. We know that sorghum was first domesticated in Africa (HARLAN 1971). However, the process of the domestication of basic crops for sedentary agriculture still remains unknown.

In the inundation area - the basin of the former larger Lake Chad - a special type of sorghum is grown on the clay soils (*firgi*). This dry-season *guinea corn* is also called dwarf sorghum or *masakwa*. In Kanuri, the dominant language in the region, sorghum is called *ngawuli*. The dry-season types are called *ngawuli firgibe* (lit. translated: sorghum of the *firgi*). During the dry season when the natural vegetation becomes dry and yellow, *masakwa* fields appear in prominent green covering large areas of the clay plains. The most important natural factor for this specialized dry season cropping is the presence of soils with a high clay content.

Furthermore, *masakwa* cultivation is based on the following preconditions:

1. knowledge of a water management system using walls and ditches
2. knowledge of the soil characteristics
3. knowledge and breeding of appropriate sorghum races

For a better understanding of *masakwa* and its related issues, a multidisciplinary sub-project (G1) has been established within the SFB 268 (Joint Research Project: History of Culture and Language in the Natural Environment of the West-African Savannah). This project in which all disciplines participate is entitled: "Natural basis for *masakwa* cultivation and its meaning for the settlement history of the clay plains (*firgi*) in the Chad basin".

### Soil

The *firgi* is a distinctive clay plain of black cotton soil. This name is used for the plain as well as for the soil itself. Several subtypes are distinguished by the

local population (KIRSCHT & SKORUPINSKI this volume, BRAUKÄMPER, KIRSCHT, PLATTE & THIEMEYER 1993). These fertile vertisols are flooded in the rainy season and retain moisture during the dry, cool period from September to January. Earth dikes 20 to 40 cm high are often built across the gradient of the gently sloping land to trap rain or flood water. This is done to further enhance the water retention capacity of the vertisols.

### Botanical aspects

Several authors have discussed the systematics, origin and evolution of the crop *Sorghum bicolor* (L.) Moench. This taxonomic name includes cultivated sorghums as well as their closest spontaneous relatives (DAHLBERG 1995, DOGGETT 1988, DE WET AND HARLAN 1971, DE WET AND HUCKABAY, 1967, SNOWDEN J.D. 1936) but a special taxon which is only used under dry season cultivation is not described. The question arose: is *masakwa* a special variety or race which can be distinguished from the sorghum grown in the rainy season? Are there any differences in the grain morphology? 15 types of rainy season and dry season sorghum were sampled for this purpose in the area of Ngala and Musene.

As a first result it was found out that *masakwa* is not a uniform type. Even on the same field there is a great variability in general habit and colour. People grow fields with different types mixed together as well as of only one type. Several of our samples could be attributed to at least the races *durra*, *caudatum* and *kafir* (pers. comm. JEFF DAHLBERG of the Tropical Agriculture Research Station of the United States Department of Agriculture in Mayagüez, Puerto Rico). It seems that there is no significant morphological difference between the sorghum varieties grown on sandy soils in the rainy season and those grown on clay soils in the dry season. This would also mean that distinct races grown in different ecological habitats cannot be distinguished by their grain morphology.

### Cultivation and processing

During the rainy season when the fields are still inundated, sorghum is sown in small seedbeds on sandy soils in the vicinity of the villages. After some weeks when the seedlings have reached a height of 30 to 40 cm, they are transferred to the clay fields which by that time have to be cleared from any other plant growth.

The distance between the sandy soils for the seedbeds and the final fields should not be too far. The natural environment of the *firgi* offers favourable conditions: sandy soils appropriate for seed beds as well as clay soils suitable for larger fields are usually found in the direct vicinity of the settlement (see KIRSCHT & SKORUPINSKI this volume).

On the fields, holes are prepared with a special digging stick (*sharawa*), two handful of water are added and the seedlings are transplanted to them. No further irrigation or fertilization is necessary. During the ripening of the plants, the field is weeded only once or twice with a hoe.

When the grains are ripe, the culms are cut near the base and left for drying on the fields. After some days the heads are cut off the culms and threshed on a hard surface. Only some of the complete heads will be retained to use them as seeds in the next growing season.

The bulk of the threshed grains is then kept in earth granaries dug into the *firgi* soil outside the villages. The remaining grain is stored in the village (PLATTE & THIEMEYER 1995). Further processing only takes place when smaller quantities are needed for daily consumption.

The first step in processing sorghum is to separate the grains from the chaff in a wooden mortar. During the pounding water is constantly added. Then the grains are dried in the sun and winnowed with a flat bowl or basket. Afterwards pounding and winnowing have to be repeated a second time before the naked grains can be taken to the mill and ground to flour.

### Historical evidence for cropping of *masakwa*

Modern agriculture in the clay plain area around Marte and Musune depends to a large extent on sorghum cultivation. In the last few years, *masakwa* became even more important since the South Chad Irrigation Project has collapsed and led to a resurgence in indigenous soil and water conservation practices, accompanied by dramatic shifts in cultivated crops (KOLAWOLE, ADEWUMI et al. 1995).

Considering the development of the specialized *masakwa* technique from the anthropological and linguistic point of view, it seems obvious that this kind of dry-season cultivation is a relatively young phenomenon because there is no oral tradition, story, proverb or riddle concerning this technique. People know little about the origin of the cereal. Expressions like "the first settlers found it here" or "we know it since our grandmother's time" are common. Only a vague idea about the origin is given; "it comes from the east".

Comparing the Chadic languages which are spoken in this area it can be shown that the word *masakwa* originates in this language family. The combination of -kw- is untypical for the Kanuri - a Nilosaharian language - but quite usual for the Chadic languages, for example:

Gamergu

*masákwa*

Glavda	<i>masogwa</i>
Kotoko	<i>masagwa</i>
Logone	<i>masakwa</i>
Mafa	<i>mosukwaray</i>

Focusing on the use of *masakwa* in a ritual context it can be stated that other plants like millet and okra are more important. For the sacrifices in the course of a wedding, it is not *masakwa*, but a liquid made out of okra and water which is used in certain places. If *guinea corn* plays a role, it is mainly as part of the gifts being exchanged during the complex performance of wedding ceremonies.

Following the hypothesis that the period of usage of plants by a people is reflected in their affection to rituals, one has to conclude that *masakwa* was introduced into the cultural setting only recently.

Our present understanding, based on patterns of archaeobotanical evidence, seems to confirm the above mentioned results. During the excavation of the settlement mound of Mege (see GRONENBORN ET AL. this volume), sorghum grains could only be found in the upper layers dated into the last 300 to 500 years. The grains are badly preserved and therefore can not be attributed to a special race. In the lower layers rice and wild grasses, mainly small wild millets, are abundant, but sorghum is completely lacking.

The excavation of Daima showed sorghum remains in several spits (CONNAH 1975). From the carbonised grains found in the archaeological layers which were identified by G. JACKSON and J.R. HARLAN, CONNAH deduces, that "it seems, that sorghum was grown at Daima from very roughly AD 800" (CONNAH 1975).

## Summary

The results of our studies on the development of *masakwa* cropping in the southwest of the Chad basin lead us to the hypothesis that settlement of the flat inundation area took place with an economy based on edible wild grasses but without growing domesticated *guinea-corn*. From this evidence we conclude that *masakwa* cultivation is a "recent" phenomenon in the Lake Chad area and did not begin before historical times. This can be confirmed by linguistic and ethnologic investigations.

For local people the term *masakwa* or *ngawuli firgibe* does not only stand for certain types of *guinea corn* which share the common feature of growing on heavy clay soils during the dry season, but also for the specialized technique of dry season cultivation. Botanical investigations show that the types can be distinguished taxonomically. In the vicinity of Ngala an Musune

sorghum *bicolor* is grown in at least three different races: *durra*, *caudatum* and *kafir*.

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