NAMIBIAN AGRONOMIC BOARD

UNAM UNIVERSITY OF NAMIBIA

NAB-UNAM SEED PROJECT

RESEARCH REPORT

SCREENING SESAME VARIETIES FOR HIGH YIELD UNDER IRRIGATED CONDITIONS IN NAMIBIA

2023/2024 CROPPING SEASON

PLANTING SEASON: 2024

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1. INTRODUCTION

The sesame seed crop is one of the oldest oilseed crops that was domesticated over 3000 years ago. The sesame crop is now widely cultivated, found in most of the tropical, subtropical, and southern temperate areas of the world, and is successfully grown in Africa. Sesame (*Sesamum indicum L.)* is one of the most drought-tolerant crops; it thrives in arid and tropical climates and can tolerate extreme heat up to 50°C. Its seed is rich in protein, vitamins, minerals, and antioxidants. The seed has numerous health and industrial benefits and is widely used for baking, medicine, cosmetics, and animal feeds (Eskandari et al., 2015; Pathak et al., 2014). Sesame is among the most imported crop commodities into the Namibian market. Over 5 years, from 2018 to 2022, Namibia imported an average of 24 tons of sesame valued at N$546,400 (ITC, 2025).

The Namibian Agronomic Board (NAB), in partnership with the University of Namibia (UNAM), as part of their 5-year MOU on Seed Research and Seed Production of selected agronomic and horticulture crops project, has been evaluating various sesame varieties. Four (4) improved sesame varieties for rainfed production (Foundation seeds) were acquired by UNAM/NAB from the National Cereals Research Institute (NCRI), Nigeria, in 2021 and planted in January 2022 and harvested in May/June 2022. The overall aim is to introduce sesame seeds of suitable varieties (high-yielding and adapted to the local climatic and field conditions) that will be considered for recommendation and commercialisation for local production.

Upon harvesting in 2022, and to ensure data reliability, the project wanted to plant the same varieties for the second season in 2023, but procurement challenges from the seed supplier made it impossible. The project, therefore, opted to plant the few foundation seeds procured in 2021 for seed multiplication and retention. This report thus highlights the outcomes of the sesame seed multiplication.

2. OBJECTIVES

The specific objectives of the sesame trial are to:

- ✓ assess the adaptability of sesame crops under an irrigation cropping system in the Namibian climatic and soil conditions;
- ✓ assess the yield performance of selected sesame seed varieties under the irrigation system;
- ✓ plant various and improved sesame seed varieties for seed multiplication; and
- ✓ test the domestic market for locally produced sesame.

3. MATERIALS AND METHODS

Three (3) 250g of different sesame seed varieties were planted at Ogongo (two varieties) and Mashare (one variety) during 2024. Table 1 below illustrates the planting details for each site.

Table 1: *Sesame seed variety planting information at each site*

Production zone	Site	Planting date	Variety	Area planted	Irrigation system
Kavango	Mashare Irrigation (Pty) Ltd	07/03/2024	E8	176.4 m2	Sprinkler
North Central	UNAM Ogongo	07/03/2024	YANDEV 55	148.2 m2	Sprinkler
			NCRIBEN 04E	159.14 m2	

4. DATA COLLECTION AND ANALYSIS

Since the seeds planted were strictly for seed multiplication, no other growth parameters were collected from the planted varieties apart from grain yield upon harvesting. After maturity, sesame was harvested, and manual threshing was done, after which the harvested grains were weighed. Data analysis on grain yield is presented in the results section below as recorded after harvesting.

5. RESULTS

There were several challenges, such as late planting, low pressure for the irrigation water, limited rainfall, with high heat waves and frost damage, which significantly affected the yield obtained in the 2024 cropping season, hence the big variation in yield compared to the 2022 cropping season. In comparison to the 2022 planting season, the 2024 season was negatively affected as the yield was way below what was obtained in the 2022 season, probably because of the crop management practices applied in 2022, and the weather conditions were better than in 2024. It should also be noted that the first season of sesame was planted at completely different sites than those of 2024, and the 2022 trial season was conducted under rainfed conditions, whilst the 2024 trials were under irrigation (sprinkler). Detailed grain yield results are presented below.

Table 2: Sesame seed variety planting information at each site

Site	Variety	Yield obtained in 2024	Yield in kg/ha in 2024	Yield obtained in 2022 (kg/ha)	Potential yield in Nigeria, the country of origin (Kg/ha)
Mashare Irrigation (Pty) Ltd	E8	3.1 kg	177.75	100.88 – Ombanje Karst 456.50 – Hochfeld farm	1,000
UNAM Ogongo	YANDEV 55	1.56 kg	105.26	166.63 – Ombanje Karst 437.00 – Hochfeld farm	600
	NCRIBEN 04E	0.4 kg	25.14	156.50 – Ombanje karst 601.25 – Hochfeld farm	1,300

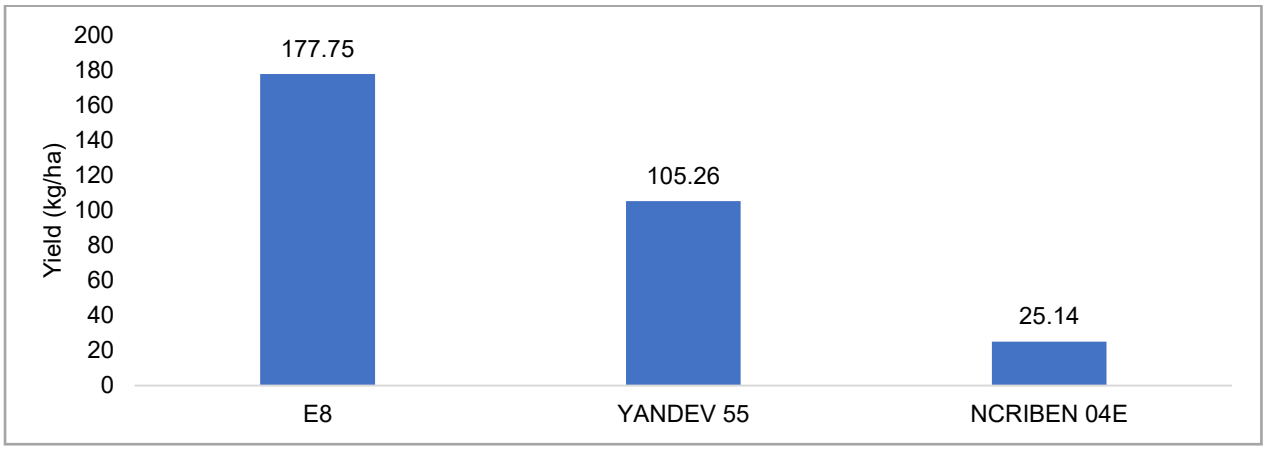

Figure 1: Sesame grain yield per variety for 2024

As presented in Table 2 and Figure 1 above, variety E8 planted at Mashare gave the highest yield of 177.75 kg/ha, followed by YANDEV 55 with 105.26 kg/ha, and lastly NCRIBEN 04E with 25.14 kg/ha, which were planted at Ogongo, respectively. These yield results are, however, way below the potential highest yield that can be obtained from these varieties as per the potential yield from the supplier, which are 1000 kg/ha for E8, 600 kg/ha for YANDEV 55, and 1,300 kg/ha for NCRIBEN 04E. This indicates that the issue of crop management practices needs to be attended to, especially the planting date, for the varieties to perform at their optimum levels under the Namibian climatic conditions.

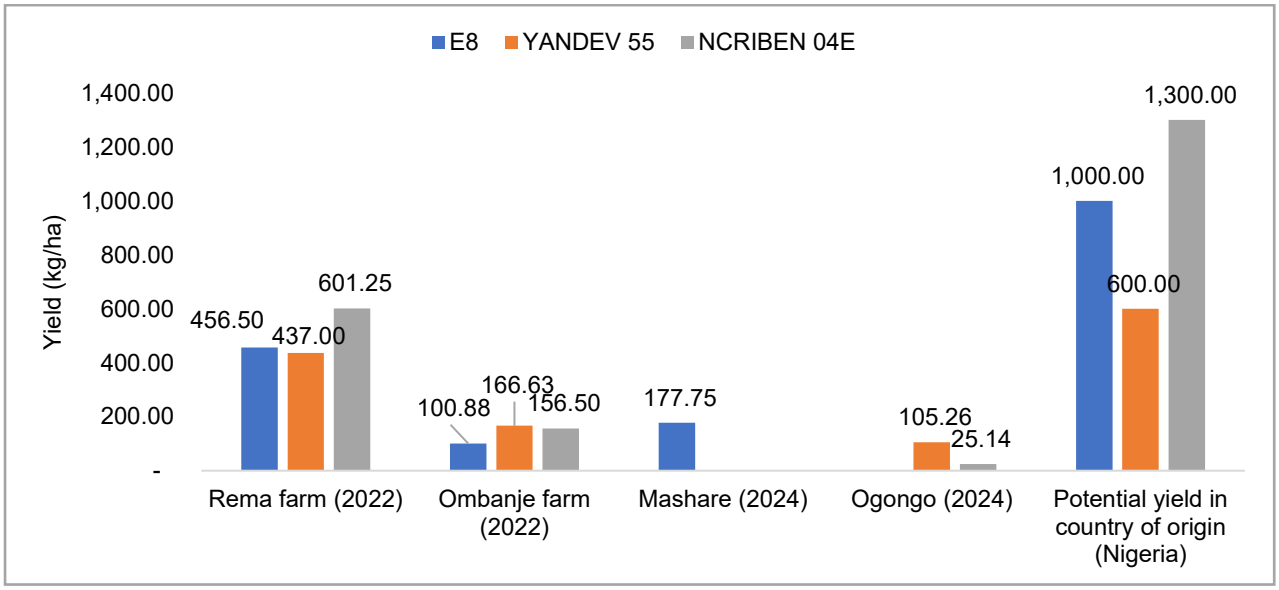

Figure 2: Sesame grain yield comparison for 2022 vs 2024 across sites

Although the sesame varieties planted in 2024 were planted at two completely different sites from where they were planted in 2022, crop performance in terms of yield was very poor in comparison to the two seasons. Figure 2 indicates that variety E8 recorded a yield of 456.5 kg/ha in 2022 (planted at Rema farm), and its grain yield for 2024 dropped to 177.75 kg/ha (planted at Mashare), although it has a potential yield of 1,000 kg/ha according to the source country. YANDEV 55 and NCRIBEN 04E have a potential yield of 1,000 kg/ha and 1,300 kg/ha; however, their yields plummeted from 437 kg/ha (Rema 2022) to as low as 105.26 kg/ha (Ogongo 2024) for YANDEV 55 and from 601.25 kg/ha (Rema 2022) to 25.14 kg/ha (Ogongo 2024), respectively.

6. CONCLUSION

The data presented in this report indicates a huge variability in terms of grain yield of sesame varieties planted in 2024 in comparison to 2022, with all the varieties performing way below their potential yield as per the country of origin (Nigeria). Although the trials planted in 2022 were under rainfed production, the yield obtained that year was far better than the yield obtained in 2024 when the trials were under irrigation. Besides the challenges of poor rainfall and water challenges experienced at the trials, one can conclude that the planting date had the greatest or significant impact on the crop performance of the 2024 trials, as the crops were severely hit by frost. The trials in 2022 were planted at the end of January and early February, and this (late planting) also affected crop performance during that season. The 2024 trials were even later as planting was done in the first week of March, risking the crop to extreme frost in June and affecting yield as the crops were not mature yet. Further research strategies, therefore, need to be considered to improve the yields and assess the variety performances within the appropriate conditions.

7. RECOMMENDATIONS

Although the purpose of this planting season was for seed multiplication, the results above indicate a poor yield due to several environmental factors coupled with unconducive crop management practices, such as late planting. The recommendations below can be considered.

a) Time of planting is very important for any crop growth; therefore, planting should always be done as early as possible, preferably at the onset of the first rains in December or January to ensure full crop development and avoid issues such as frost, etc.
b) Provision for irrigation water should always be prioritised to water the crops during periods of dry spells.
c) For seed multiplication purposes, avoid planting different varieties at the same site or too close to each other on the same field to avoid cross-pollination. The seeds harvested at Ogongo may not be considered pure, as cross-pollination may have occurred, thereby contaminating the varieties.
d) It is recommended that the results from the 2024 be disregarded and the trial be repeated, in consideration of all the correct requirements and procedures, to ensure a reliable research experiment.

8. REFERENCES

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