



Smallholder Farming Practices in Orange-Fleshed Sweet Potato (*Ipomoea batatas* Lam.) Farms in Two Agroecological Zones of Burkina Faso

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Authors' contributions

This work was carried out in collaboration among all authors. Authors GKMV and CPJA designed the study, performed the statistical analysis, wrote the protocol, and wrote the first draft of the manuscript. Authors OL and SM managed the analyses of the study. Authors BJ and HE managed the literature searches. All authors read and approved the final manuscript.

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Abstract

Orange-fleshed sweet potato (OFSP) is cultivated by smallholder farmers in Burkina Faso, but production practices and constraints differ across agroecological settings. This study described smallholder OFSP production systems in the northern and southern Sudanian zones, with emphasis on crop management, fertiliser use and farmer-reported constraints. The study was conducted in 2024 and 2025 in the northern and southern Sudanese areas of Burkina Faso. Individual surveys and focus groups were carried out

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with 240 farm managers exactly in 11 villages across 3 provinces in the southern Sudanian zone and 10 villages in 2 provinces in the northern Sudanian zone. These surveys revealed agricultural practices in both zones, including monoculture, intercropping, and crop rotation. Crop rotation was dominant (80% of farmers) and alternates with other food crops and sometimes cash crops. The use of local varieties was predominant, but the use of inputs remained limited : 89.2% of farmers applied less than 10 t/ha of organic fertilizer (compost, manure, poultry droppings, household waste, biochar) and 60.8% used less than 100 kg/ha of mineral fertilizers (NPK, urea). Furthermore, significant constraints hampered production: poor soil quality (25.8%), lack of funds to purchase fertilizers (29.46%), and low rainfall (19.10%). Thus, to increase the production of orange-fleshed sweet potatoes in Burkina, it would be beneficial to improve soil fertility management, access to inputs and climate-adapted support strategies.

Keywords: *Orange-fleshed sweet potato; Ipomoea batatas; smallholder farming; Sudanian zones; crop rotation; intercropping; organic fertilisation; mineral fertilisers; farmer perceptions; production constraints.*

1. Introduction

Agriculture employs more than 80% of the workforce in Burkina Faso and accounted for approximately 18% of gross domestic product in 2022 (International Monetary Fund, 2024). However, the sector struggles to meet the food needs of a rapidly growing population. Food insecurity remains a concern, compounded by low agricultural productivity and rising input costs (International Monetary Fund, 2024). This situation is partly due to unpredictable climatic conditions (rainfall and temperature) and partly due to unsuitable agricultural practices, leading to the continuous degradation of the productive capacity of the land (Thiombiano, 2000). In response to these challenges, several national and international programmes, in collaboration with agricultural research, have promoted crops with high nutritional value that are adapted to local conditions. Among these crops, the orange-fleshed sweet potato (OFSP) has emerged as a strategic option to support food and nutrition security across all regions of Burkina Faso. Sweet potato can offer relatively reliable yields under varied growing conditions, although productivity depends on appropriate crop management (Carey *et al.*, 2018). Genetic diversity in sweet potato germplasm from Burkina Faso has also been documented (Koussao *et al.*, 2014). OFSP may also support smallholder livelihoods, as sweet potato production can contribute to household food security under conditions where other crops face constraints (Carey *et al.*, 2018). In addition, its high beta-carotene content makes it an important crop for combating malnutrition and vitamin A deficiency (Somé *et al.*, 2015). Its multiple uses for household consumption, sale, and processing also give it strong economic potential for smallholder farmers (Ouédraogo *et al.*, 2020). Despite these advantages, OFSP production remains constrained by several factors, including limited access to quality inputs, limited mechanisation of farming operations, and challenges related to diseases and pests. THESE constraints affect yields, which vary depending on practices and resources. Although this crop has gradually become integrated into family farming systems, information remains limited on the diversity of production practices and the constraints faced by farmers in the different agroecological zones of Burkina Faso. Understanding these smallholder production systems is therefore essential for identifying the technical and socio-economic factors that influence productivity and for defining appropriate improvement strategies. Evidence from Côte d'Ivoire indicates that sweet potato cultivation practices and farmer-reported production constraints vary across localities (Kouassi *et al.*, 2024). A review of sweet potato improvement in sub-Saharan Africa identifies drought and poor soil fertility among the challenges affecting production (Makhubu *et al.*, 2024). A field study in Nigeria examined organic fertiliser treatments for sweet potato grown on nutrient-depleted soil, although the treatment differences in growth and yield were not statistically significant (Akata *et al.*, 2026). An investigation in southern Ethiopia also reported lower sweet potato weevil infestation under selected legume intercrops than under sole cropping (Fufa & Kifle, 2025). The findings are expected to support recommendations adapted to local realities, with a view to promoting sustainable and efficient production of orange-fleshed sweet potatoes in family farms. Nevertheless, comparative evidence on OFSP cropping operations, fertiliser use and farmer-reported production constraints across the northern and southern Sudanian zones of Burkina Faso remains limited. This gap makes it difficult to describe how smallholder practices differ between the two zones and to identify priorities for locally appropriate support.

This work aims to analyse smallholder production techniques for OFSP in the northern and southern Sudanian zones of Burkina Faso. Specifically, it seeks to: (i) study the socio-demographic characteristics of the farmers; (ii) identify the different crop operations practised by farmers in OFSP cultivation; (iii) assess the different types of fertilizers applied; and (iv) determine the main strengths and constraints associated with OFSP production on family farms.

2. Material And Methods

2.1 Study Area

The surveys were conducted in four regions of Burkina Faso, belonging to two agroecological zones (Table 1). These are the South Sudanian zone, situated south of the 11°30' N parallel, with an average annual rainfall of 900 to 1,200 mm during a six-month rainy season, and the North Sudanian zone, between the 11°30' and 14°00' N parallels, with 600 to 900 mm distributed over four to five months.

The maximum and minimum temperatures follow a similar annual pattern in both agroecological zones, ranging from 28 to 48 °C and 16 to 27 °C, respectively (SP/CONAGESE, 2001). A review of the literature, including agricultural statistics from the supervising ministry and previous studies on OFSP cultivation in Burkina Faso, enabled the identification of five provinces and about twenty villages.

2.2 Methodology

The surveys were conducted using semi-structured questionnaires prepared using Sphinx Lexica version 4.6 and subsequently adapted to the study objectives (Appendix 1). The interviews were carried out in French and Mooré in the provinces of Sissili and

Kadiogo, and in French and Dioula in the provinces of Kénédougou, Houet, and Comoé. The farmers surveyed were mainly farm managers, selected with the support of the decentralised services of the Ministry of Agriculture and local village resource persons. The selection criteria included, among other things, a minimum of five years of experience in PDCO production as well as active involvement in this crop. In total, 240 farms were surveyed, with 60 producers per province.

Table 1. List of survey areas

Agroecological zones Survey	Regions	Provinces	Cities/Villages
South Sudanian	Hauts-Bassins	Houet, Kénédougou	Bama, Dieri, Sian, Koutoudéni, Orodara, Bobo dioulasso
	Cascades	Comoe	Banfora, Nafona, Bounouna, Karfiguéla, Beregadougou
North Sudanian	Centre	Kadiogo	Tanghin d'assouri, Bassinko, Laye, Komsilga, Loumbila, Roumtenga
	Centre-Ouest	Sissili	Mouna, Sanga, Leo, Fido

The information collected focused on:

- ✓ The identity and characteristics of the farmers (name, age group, gender, education level, cultivated areas, varieties used: local/improved, field accessibility);
 - ✓ Farming techniques: organic fertilisation (type, dose), mineral fertilizers (type, dose, application date), crop rotation, and crop association.
 - ✓ The production constraints encountered.
- The interviews were conducted in French and Mooré (Sissili and Kadiogo provinces), or in French and Dioula (Kénédougou, Houet, and Comoé provinces).

2.2.1 Data Processing

The collected data were processed using a predefined and consolidated grid. They were then entered into the Excel 2013 spreadsheet, exported to Stata version 17 for descriptive data analysis, and subjected to Pearson's chi-square (χ^2) test to assess correlations between key criteria associated with the use of organic fertilisation in rural areas. The adjusted coefficient of determination (R^2) and the significance test ($p < 0.05$) made it possible to assess the strength and significance of these correlations.

2.2.2 Ethical Consideration

This study was conducted in accordance with ethical principles applicable to research involving human participants. Before each interview, the producers were informed about the study's objectives, the nature of the information sought, the scientific use of the data collected, and the voluntary nature of their participation.

Participants were free to refuse to answer any question or to end the interview at any time, without any consequences.

To preserve confidentiality, no information that could individually identify participants was associated with the analyzed data or presented in the manuscript.

3. Results

3.1 Socio-Demographic Characteristics of the Surveyed People

Table 2 summarises the socio-demographic characteristics of the surveyed people. Men predominated in OFSP farming in all provinces, except in Kadiogo, where the gender distribution was more balanced. The predominant age group (36-64 years) was predominant in all provinces. The majority of producers in Kadiogo, Comoe, and Kénédougou were illiterate, while in Houet and Sissili, producers had attained primary and secondary education, respectively.

3.2 Characteristics and Farming Operations of Fields

The characteristics and farming operations of the fields are presented in Table 3. The results showed that the largest areas (1-2 ha) were most common in Comoé (90%), Kénédougou (30%), and Sissili (70%), while in Kadiogo, all farmers owned plots smaller than 0.5 ha. Local varieties dominated, except in Kadiogo and Sissili, where improved varieties were preferred. Crop rotation was almost universal: 100% in Houet and Kénédougou (with cereals, legumes, or cassava), and up to five years in Sissili (with yam or cassava). Monoculture was less common but notable in Kadiogo (40%), and nearly absent elsewhere (13% in Comoé, 6% in Sissili). Few farmers practised crop association: 63% in Comoé, 60% in Houet, and 75% in Sissili did not intercrop. By contrast, 95% in Kénédougou cultivated OFSP under mango or orange orchards, and 60% in Kadiogo intercropped peanuts and okra.

3.3 Key Criteria Promoting the Use of Organic Fertilizer in Rural Areas

Organic fertilisation (OF) in rural areas mainly depended on livestock farming and the presence of manure pits. Fig. 1 shows that most farmers raised livestock in the North and South Sudanian zones. All farmers in Houet and 80% in Sissili combined OFSP

cultivation with livestock farming. The lowest rates were observed in Kénédougou and Comoé. No manure pits were recorded in Kénédougou. In contrast, in Sissili Province, more than 80% of farmers had constructed them to produce their own compost.

Table 2. Socio-demographic characteristics of the people surveyed

Features	Comoé <i>n</i> =60	Houet <i>n</i> =20	Kénédougou <i>n</i> =40	Total <i>n</i> =120	Kadiogo <i>n</i> =60	Sissili <i>n</i> =60	Total <i>n</i> =120
Gender							
Female	18(30%)	6(30%)	13(32.5%)	37(30.8%)	34(56.6%)	12(20%)	46(38.3%)
Male	42(70%)	14(70%)	27(67.5%)	83(69.2)	26(43.3%)	48(80%)	74(61.7%)
Age code							
[20-35]	13(21.7%)	0(0%)	10(25%)	23(19.2)	9(15%)	22(36.7%)	31(25.8%)
[36-64]	47(78.3%)	20(100%)	30(75%)	97(80.8%)	27(45%)	34(56.7%)	61(50.9%)
[65+]	0(0%)	0(0%)	0(0%)		24(40%)	4(6.6%)	28(23.3%)
Education level							
None	32(53.3%)	0(0%)	10(25%)	42(35%)	30(50%)	20(33.4%)	62(51.7%)
Koranic	0(0%)	5(25%)	0(0%)	5(4.2%)	18(30%)	0(0%)	18(15%)
Primary	23(38.3%)	11(55%)	16(40%)	50(41.7)	12(20%)	16(26.6%)	28(23.3%)
Secondary	5(8.3%)	2(10%)	14(35%)	21(17.5)	0(0%)	24(40%)	12(10%)
University	0(0%)	2(10%)	0(0%)	2(1.6)	0(0%)	0(0%)	0(0%)

Pearson χ^2 statistical tests:

Gender: $\chi^2 = 40.00$ (df=4, $p < 0.001$)

Age code: $\chi^2 = 339.68$ (df=8, $p < 0.001$)

Education level: $\chi^2 = 134.00$ (df=16, $p < 0.001$)

Table 3. Field characteristics and farming operations in the surveyed areas

Features		Provinces									
		Comoé		Houet		Kadiogo		Kénédougou		Sissili	
		Nb	%	Nb	%	Nb	%	Nb	%	Nb	%
Field area	[0-0.5 ha]	3	10	5	50	30	100	4	20	6	20
	[0.6 - 1 ha]	0	0	5	50	0	0	10	50	3	10
	[1-2 ha]	27	90	0	0	0	0	6	30	21	70
Varieties	Improved	14	46	2	20	30	100	6	30	21	70
	Local	16	53	8	80	0	0	14	70	9	30
CR	R0	4	13	0	0	12	40	0	0	6	20
	R1	3	10	4	40	6	20	8	40	0	0
	R2	18	60	6	60	9	30	7	35	0	0
	R3	5	16	0	0	3	10	5	25	21	70
	R5	0	0	0	0	0	0	0	0	3	10
CA	CA0	19	63	6	60	12	40	1	5	22	73
	CA1	11	36	4	40	12	40	19	95	8	26
	CA2	0	0	0	0	6	20	0	0	0	0

Legend: CR: crop rotation; CA: crop association; R0: no rotation; R1: rotation every year; R2: rotation every two years; R3: rotation every three years; R5: rotation every 5 years; CA0: no crop association; CA1: crop association with one crop; CA2: crop association with two crops

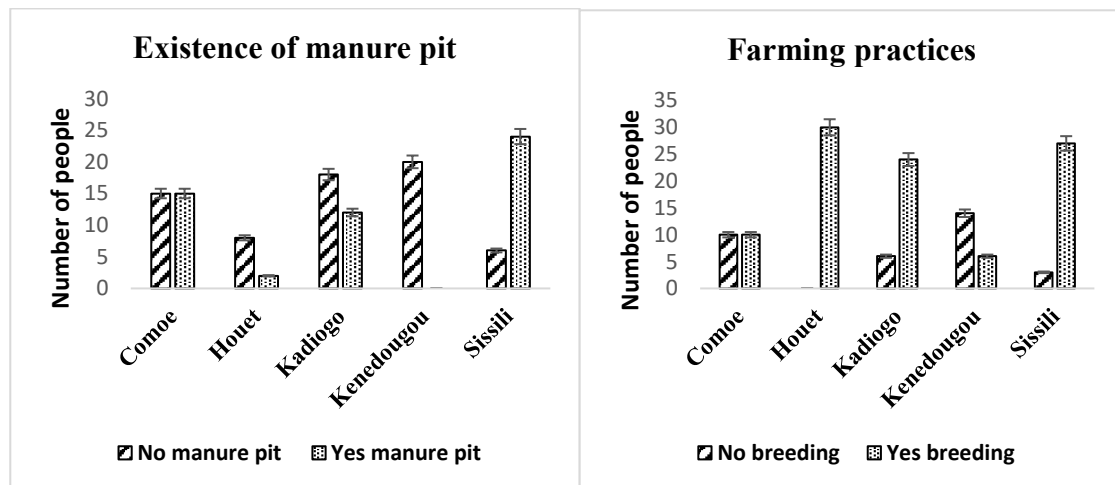


Fig. 1. Activities carried out on small farms

Table 4 shows the relationships between livestock farming, the presence of manure pits, and the use of organic fertilisation (OF) in OFSP production. The results revealed a strong correlation between the use of OF and livestock farming: farmers in the surveyed areas applied the highest amounts of OF. No correlation was observed between OF use and the presence of manure pits.

Table 4. Correlation between the use of manure with livestock farming practices and the existence of manure pits

	Manure pit	Livestock	Organic fertilizer
Manure pit	1	0.548**	0.049
	.	0	0.592
Livestock	0.548**	1	0.222*
Organic fertilizer	0	.	0.015
	0.049	0.222*	1
	0.592**	0.015	.

Legend: **: The correlation is significant at the 0.01 level; *: The correlation is significant at the 0.05 level

3.4 Fertilization in Rural Area

Table 5 shows the use of organic (OF) and mineral (MF) fertilisers in the surveyed areas. Most farmers used both OF and MF to fertilise their fields with the aim of increasing yields. The highest rates of OF use were observed in Kadiogo (95%) and Houet (90%), compared with Comoé (73%), Kénédougou (70%), and Sissili (70%), where the proportions of users were slightly lower.

For MF, the use rate was 100% in Sissili and Houet (100%), followed by Comoé (90%). The provinces of Kénédougou (70%) and Kadiogo (60%) showed lower use, with 30% and 40% of producers, respectively, not using chemical fertilizers.

Table 5. Use of fertilisation in rural areas

Features		Comoé n=60	Houet n=20	Kénédougou n=40	Total n=120	Kadiogo n=60	Sissili n=60	Total n=120
OF	No	18(30%)	4(20%)	12(30%)	34(28.3)	4(6%)	18(30%)	22(18.3%)
	Yes	42(70%)	16(80%)	28(70%)	86(71.7)	56(94%)	42(70%)	98(81.7%)
	Chi-Square	10.19						
	DF	4						
	P-Value	0.001						
MF	No	6(10%)	0(0%)	8(20%)	14(11.7%)	24(40%)	0(0%)	24(20%)
	Yes	54(90%)	20(100%)	32(80%)	106(88.3%)	36(60%)	60(100%)	96(80%)
	Chi-Square	12.35						
	DF	3						
	P-Value	0.02						

Legend: *: Number (percentage)/Provinces; n = number of people surveyed; O-M: Organic fertilization; M-F: Mineral fertilization

3.5 Organic Fertilization

OF was applied in a single application before OFSP planting, during ridge or mound formation. The type of OF varied by area, and six main types were identified (Fig. 2):

- ✓ Ruminant manure (from small and large ruminants) dominated in Houet (70%) and Kénédougou (70%);
- ✓ Poultry manure was the second most common type of organic fertiliser, particularly in Kadiogo (50%) and Comoé (40%).
- ✓ Compost was the predominant fertiliser in Sissili (50%) and Comoé (33%);
- ✓ Household waste was notable in Comoé (26.7%), Kénédougou (30%), and Sissili (30%);
- ✓ Biochar was used in Houet (10%);
- ✓ Soumbala residues were a common feature of Kadiogo (20%).

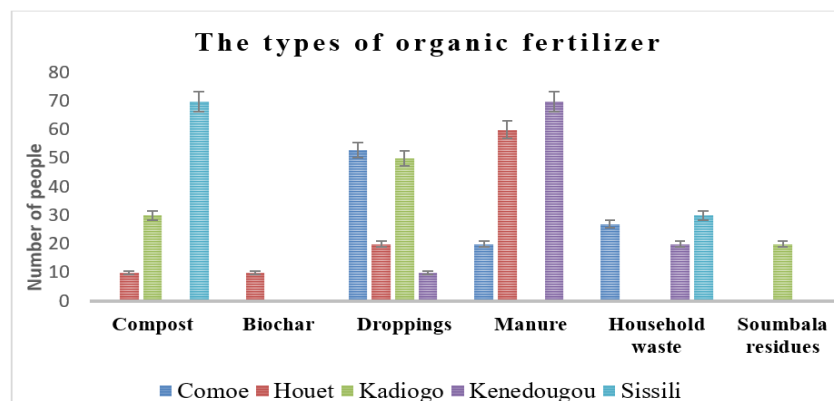


Fig. 2. The different types of organic fertiliser

Table 6. Types of mineral fertilizers in the surveyed area

Type of mineral fertilizer	Provinces	Comoe		Houet		Kadiogo		Kénédougou		Sissili		Total	
		Nb	%	Nb	%	Nb	Nb	Nb	%	Nb	%	Nb	%
	14_23_14	1	3.3	0	0	18	60	1	5	6	20	31	25.7
	14_23_14+uree	2	6.7	3	30	0	0	0	0	24	80	34	28.2
	15_15_15	1	3.3	1	10	0	0	8	40	0	0	10	9.3
	15_15_15+uree	1	3.3	6	60	0	0	4	20	0	0	14	11.2
	Uree	22	73.3	0	0	0	0	3	15	0	0	30	24.8
Application of date	1 application	27	90	0	0	25	80	14	60	1	3	67	55.83
	2 applications	3	10	10	100	5	20	6	40	29	96.7	53	44.16

Legend: Nbr= number of farmers; %=percent

Table 7. Amounts of fertilisers used

Amount of fertilizer	fertilizer doses	Provinces											
		Comoe		Houet		Kadiogo		Kénédougou		Sissili		Total	
		Nb	%	Nb	%	Nb	%	Nb	%	Nb	%	Nb	%
Organic fertilizers	0-10 t	28	93.3	9	90	21	70	20	100	29	96.7	107	89.2
	11 - 20 t	2	6.7	1	10	3	10	0	0	1	3.3	7	5.8
	21 - 30 t	0	0	0	0	3	10	0	0	0	0	3	2.5
	31 - 40 t	0	0	0	0	2	6.7	0	0	0	0	2	1.7
	+ de 40 t	0	0	0	0	1	3.3	0	0	0	0	1	0.8
Mineral fertilizers	0-100 kg	19	63	2	20	18	60	8	40	26	86.7	73	60.8
	101-200 kg	10	33	7	70	0	0	12	60	4	13.3	33	27.5
	201-300 kg	1	3.3	0	0	0	0	0	0	0	0	1	0.8
	301 400 kg	0	0	0	0	6	20	0	0	0	0	6	5
	+ 400 kg	0	0	1	10	6	20	0	0	0	0	7	5.8

Legend: kg= kilogram; t=tonnes

3.6 Mineral Fertilization

Table 6 shows that most farmers applied fertiliser in a single dose, especially in Comoé (90%), Kadiogo (80%), and Kénédougou (60%). This single application was generally carried out 30 days after transplanting (DAT) sweet potato cuttings, up to 50 DAT for some farmers. In Houet (100%) and Sissili (96.7%), mineral fertilizers were applied in two applications: the first application was made at 15 or 30 DAT, and the second between 45 and 50 DAT, at the beginning of sweet potato flowering. Among the mineral fertilizers used, NPK 14-23-14 and urea were the most common, especially in Sissili (80%). In Comoé (73.3%), only urea was used; in Kadiogo (60%), only NPK 14-23-14 was used. The 15-15-15 formulation (alone or with urea) was used least frequently.

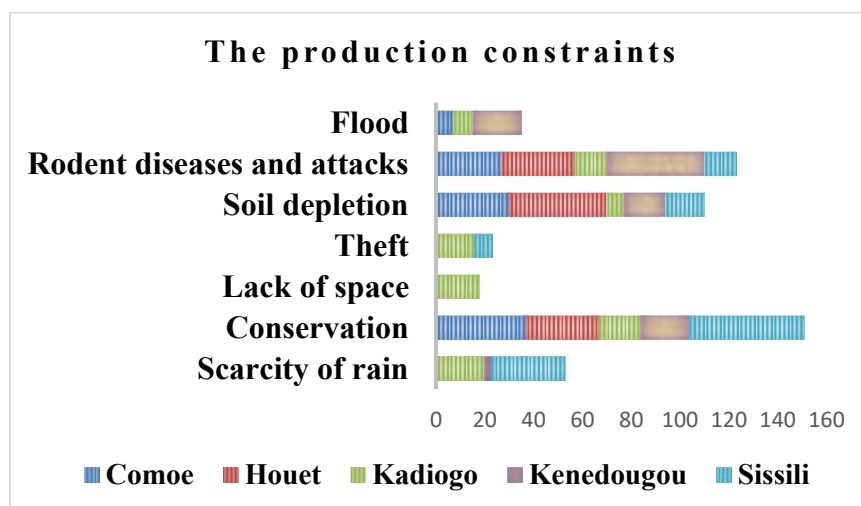


Fig. 3. The production constraints of OFSP

3.7 Fertilizer Amounts Used

Organic fertiliser (OF) application rates varied considerably among farmers and regions, as shown in Table 7. Most farmers (89.2%) applied less than 10 t/ha; Kénédougou (100%) and Sissili (96.7%) recorded the lowest amounts. Doses above 40 t/ha were mainly found in Kadiogo, followed by Comoé and Sissili (10 to 20 t/ha). For mineral fertilisation, the amounts remained very low in almost all provinces (more than 60% of farmers used less than 100 kg/ha). In Sissili (86.7%) and Comoé (63%), 50-100 kg/ha of NPK was used. In Houet and Kénédougou, the doses reached three and four bags per hectare but remained well below the recommended 6 bags/ha. The maximum doses (300 to 400 kg/ha) were concentrated in Kadiogo and Houet.

3.8 Peasant Perception on OFSP Production in Burkina Faso

Fig. 3 presents the main constraints hindering OFSP production in Burkina Faso, as reported by respondents. Tuber preservation was the most frequently cited constraint (36.7%), followed by the lack of financial resources to purchase mineral fertilisers (29.46%, especially in Kadiogo, Sissili, and Kénédougou). Soil depletion, reported by 25.8%, was particularly concerning in Comoé and Houet, with rates ranging from 60 to 70%. Rainfall scarcity mainly affected the North Sudanian zone (Kadiogo: 40%; Sissili: 33%). Flooding remained relatively uncommon (3.34%), limited to Comoé (16.7%), Kadiogo (10%), and Kénédougou (30%). Theft (2.66%) was reported mainly in the North Sudanian zone, in Kadiogo and Sissili provinces, where 16% and 7% of farmers, respectively were affected. The lack of space (2.04%) to grow OFSP only affected Kadiogo province, which faced a rapidly growing population.

4. Discussion

The results indicate that OFSP (orange-fleshed sweet potato) cultivation is carried out on small plots mainly managed by adult men aged 36 to 64 years. The smallest areas (< 0.5 ha) predominated in Kadiogo, due to strong land pressure linked to population growth, limiting land expansion. A survey of sweet potato farmers in Bama, western Burkina Faso, also documented relatively small cultivated plots (Ouédraogo *et al.*, 2020). In contrast, larger plots (up to 2 ha) were recorded in Comoé, Sissili, and Kénédougou. Earlier research also identified Sissili and Kénédougou among major sweet potato-producing provinces (Koussoubé *et al.*, 2018). Regarding cultivation practices, farmers combined monoculture with rotations involving cereals or cash crops; earlier surveys also documented diverse cropping practices among sweet potato growers in Burkina Faso (Koussoubé *et al.*, 2018). In Kadiogo Province, Burkina Faso, farmers commonly intercrop orange-fleshed sweet potato (OFSP) with maize, groundnuts, cowpea, or okra. These practices may reflect a strategy to maximize land-use efficiency under land constraints. Similar motivations for intercropping have been reported among smallholder farmers in Malawi (Longwe *et al.*, 2023). The proportion of farmers using organic fertiliser was very high in the surveyed areas, but the amounts applied remain very low: about 89% of producers used less than 10 t/ha. Research among sweet potato growers near Bongor, Chad, also documented fertiliser use as part of local cultivation practices (Djinet *et al.*, 2019). These small doses varied by location and soil type. Differences in organic fertiliser application may reflect variation in soils and resource availability; the organic-matter status of soils in the southern Sudanian zone has been documented by

Pallo *et al.* (2008). Soil organic-matter conditions have also been investigated in the northern Sudanian zone (Pallo *et al.*, 2009), while the present survey found that some farmers in Kadiogo applied more than 40 t/ha. Research in Burkina Faso has also documented changes in soil chemical and microbial properties under fallow management (Bilgo *et al.*, 2007). Producers also tended to prioritise high-quality organic fertilisers, consistent with work by Daadi and Latacz-Lohmann (2022), with poultry manure compost favoured in Sissili. These differences should be considered alongside the documented variation in soil organic matter across Sudanian agroecological zones (Pallo *et al.*, 2008, 2009). As for the use of mineral fertilizers, most farmers (86%) used them, but only 11.6% followed the recommended doses recommended by INERA (300 kg/ha): 40% in Kadiogo, 10% in Houet, and 3.3% in Comoé. Other farmers (74.4%, especially in Kénédougou and Sissili) limited themselves to 50-100 kg/ha, held back by the high cost of fertilisers and low incomes. Broader evidence from Burkina Faso also identifies rising fertiliser costs as a constraint affecting agricultural production (International Monetary Fund, 2024). The study revealed that in Burkina Faso, farmers wanted to intensify OFSP production; however, they face major constraints on their farms. These constraints included a lack of financial resources (29.46% of those surveyed), affecting the purchase of mineral fertilisers, access to and production of organic manure (OM). In addition, soil degradation affected 25.8% of farmers, leading to a decrease in soil fertility. Indeed, the amounts of manure produced by farmers were insufficient to compensate for losses through mineralization (Blanchard *et al.*, 2014). To address this, crop–livestock integration has been recommended by authors such as Dongmo (2009). This is consistent with our findings, which show a positive correlation between the use of organic fertilisers and livestock farming. Animal manure is a recognised source of organic amendments in West African farming systems, although its composition and quality vary (Blanchard *et al.*, 2014). However, the farmers surveyed were small-scale livestock owners (<10 heads per species), limiting the available volumes. A potential alternative is to incorporate crop residues to increase locally produced organic fertilizer. Research on West African farm manures indicates opportunities to improve the quality and use of locally produced organic fertilisers (Blanchard *et al.*, 2014). Increasing this proportion could reduce input costs and support more sustainable production.

5. Conclusion

This study characterised smallholder orange-fleshed sweet potato (OFSP) cultivation in the northern and southern Sudanian zones of Burkina Faso, documenting differences in cropping practices, fertiliser use and production constraints across the surveyed provinces. Farmers practised crop rotation, monoculture and intercropping, while the use of local and improved varieties varied by location. Organic fertilisers were obtained from several sources, including livestock manure, compost and other locally available materials. Mineral fertiliser use also varied in formulation, timing and reported quantity. Although fertiliser application was common in several surveyed areas, the reported amounts were generally low. The observed positive association between livestock farming and organic fertiliser use highlights the relevance of crop–livestock activities to existing nutrient-management practices, without establishing a causal relationship. Farmers also reported constraints involving tuber preservation, fertiliser affordability, soil depletion and rainfall scarcity. These findings indicate that recommendations for OFSP cultivation should account for differences in local practices and resource availability. Further evaluation of soil fertility management and input-access strategies would help determine which options are most appropriate for the surveyed production settings.

6. Limitations

This study surveyed 240 farm managers in selected villages across five provinces of Burkina Faso during 2024–2025. Participant selection, supported by agricultural services and local resource persons, may limit sample representativeness. Data on farming practices, fertiliser use and production constraints were collected through interviews and focus groups and may be subject to recall and reporting biases. The observational design limits causal interpretation, while differences in soil conditions and farm management may influence the findings. Future studies should incorporate broader sampling, direct measurements of soil properties, fertiliser application and crop yields, and longer-term assessments to strengthen the generalisability of the findings.

Consent

Participant's written informed consent was obtained before the interview began. Given the low literacy level of some participants, consent was obtained orally after explanation, in a language understood by the participant.

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Declaration of AI Use

This manuscript was prepared through the intellectual contributions of the author(s) to the study design, data analysis, interpretation of results, and scholarly content. Grammarly and ChatGPT were used solely to assist with grammatical refinement and reference formatting during manuscript revision. The author(s) accept full responsibility for the accuracy, integrity, and final content of the manuscript.

Competing Interests

Authors have declared that no competing interests exist.

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