SECTION V

Economics & Post-Harvest

A study on the adoption of improved maize technologies in northern Ghana

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Abstract

Résumé

Introduction

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2020 (1995)
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500 000 (1998)
(2001; ,
1992; . 1990).

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Materials and Methods

Sources of data

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Data analysis

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(1964,

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Results and Discussion

Socioeconomic characteristics of the sampled households

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21 69 , 43 . 65%

41 .

(1).

5% .

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Table 1. Main characteristics of sampled households.

		% .
%		
(%)	248	95
(%)	13	5
( )	43.4	9.7
(.)	13.1	8.4
(%)	174	66.7
(%)	25	9.6
(%)	62	23.8
/ ( )	4.4	3.6
- (%)		
-	128	49.0
-	133	51.0
-		
-	207	79.5
- -	54	20.5
(%)		
	63	24.1
	6	2.2
	172	73.6

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(81%) 13%

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5.2 (1).
0.6 .

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(1).

Maize cropping system in northern Ghana.

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Table 2. Gender responsibility and household task division in maize production (%).

	89.7	0.4	10.0
	12.6	31.1	36.3
	77.0	2.3	20.7
	36.4	3.4	20.7
	5.0	9.0	85.8
	24.5	6.5	69.0
	14.9	13.4	71.6

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27%

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(3).

Table 3. Farming practices in northern Ghana as indicated by farmers in the survey.

	68	26.8
	144	55.2
	69	18.6
( )	200	76.6
	61	23.4
	223	85.4
	48	14.6
( )		
	85	38.1
	108	48.4
	14	6.3
	16	7.2
( ) +	200	89.7
+	23	10.3
	0	0.0
	64	24.4
	61	23.4
3	6	2.3
	86	33.0
	44	16.9

, 79%

. (51%)

.

(, 1982/83; , 1983/84; , 1984/85; , 1985/86; , 1988; , 1989; . 1992). -

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, 38%

, 7% 48% ,

(3).

( )

. (58%)

, .
(28%) 4% .

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(3).

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. ,
. 17%
(3).

Adoption of improved varieties[1]

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, ,
.
(4).

Table 4. Major maize cultivars grown in Northern Ghana (%)*.

	16.0	14.2
	17.6	11.1
	20.0	13.0
	21.4	8.4
	10.7	6.4
	11.9	7.7
	3.4	0.0
	1.5	0.0
	12.4	0.0
	62.4	25.0

* .

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[2]
, , .

[1] : (1)
, (2)
. (. 1999).

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[2]
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, 75% .

(11.3%),
(21.5%), (23.7%),

(9.6%).

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( ), ( ),
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20% 1988 75%
1999.
,
, 39% 1999.
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Table 5. The Rates of adoption of improved varieties of maize in northern Ghana.

	-	-		-	-	-	
1988	3.4	4.2	8.4	0.0	0.0	4.6	19.6
1989	3.1	5.0	8.8	0.0	0.0	6.1	23.4
1990	4.6	5.7	10.3	0.0	0.	8.8	27.9
1991	7.3	9.2	10.3	0.0	3.1	9.6	34.7
1992	9.6	9.2	11.1	0.8	4.2	10.7	36.2
1993	11.9	12.3	12.3	0.8	5.4	11.9	44.2
1994	14.2	13.8	11.9	0.8	9.2	14.2	48.7
1995	17.2	15.3	14.9	0.8	11.9	14.2	60.4
1996	19.9	16.9	16.1	1.1	14.2	20.3	69.4
1997	20.3	18.4	16.1	1.5	16.1	22.6	73.2
1998	20.3	18.4	15.4	1.1	17.3	22.2	76.2
1999	22.2	17.6	15.3	1.5	17.6	19.9	75.4

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1.
" - "
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1999.

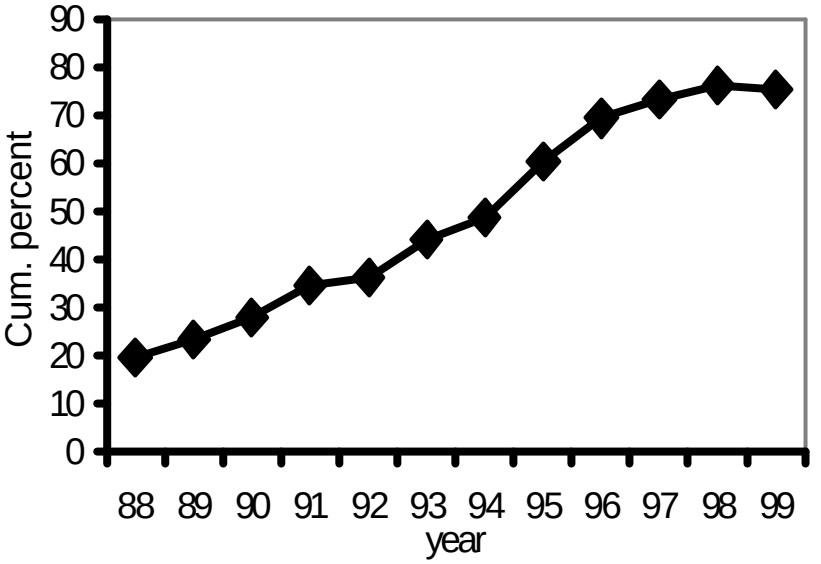

Fig.1. Cumulative adoption curve for improved maize varieties in northern Ghana.

Adoption decision model

Choice of variables and hypotheses

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Empirical results

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1993). ,
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4.3

Table 6. Descriptive statistics of variables used in the empirical model.

	( )	43.4	21	69
.	(.)	13.1	1	57
	( )	4.4	0.2	5
		2.8	0	10
.		12.3	1	41
	: 1	.81	0	1
	,			
	: 1	0.45	0	1
	,			
	: 1	0.50	0	1
	,			
	: 1	0.56	0	1
	,			
	: 1	0.62	0	1
	,			
	: 1	0.65	0	1
	,			
	: 1	0.55	0	1
	,			
	: 1	0.9	0	1
	,			

(1996; 1985; 1984; 1980)[4].

, (
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[4] ( )
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Table 7. Tobit model estimate for the intensity of adoption of improved maize varieties in Northern Ghana.

			-
	-0.983	0.573	-1.715*
	0.024	0.012	1.961**
	-0.061	0.014	-4.252***
	0.828	0.031	26.565***
	0.025	0.042	0.605
	-0.051	0.013	-3.972***
	0.671	0.417	1.691*
	0.724	0.253	2.857***
	0.054	0.279	0.192
.	-0.079	0.228	-0.349
	0.251	0.340	0.739
	0.222	0.122	1.823*
	0.104	0.267	0.388
	0.538	0.254	2.116**
	1.672	0.077	21.701

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* 10%, - , ** 5%, - , *** 1%, - .

= 87.

= -490.71

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44

6 (99% ,

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4

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- (. 1999, 2000; . 2000; 1993; 1993; . 1990; 1975; 1970).

Conclusion

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( ), . ,

20% 1988, 76% 1999. ,

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References

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: .
American Journal of Agricultural Economics 66: 405 415.

, . ., . . . 1985.
.
Journal of Agricultural Economics 36(3).

Appendix A: Empirical model??

(1985),
:

* = ? + ? + ? ..1

= (*) ..2
= * * > 0
= 0,

Y* **X** (
) .
Y* . , ,
(**Y* >0**) (**Y* =0**).
Y ( ) , **X**
, ?, ? ?

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(*) = *. (*/?) + ?. (*/? ..3

(*)= ( )
? = (7)
*/? =
(*/?)= ,

(*/?) = = (*/?).

Appendix B

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6
(7) 1,
= 4.039 ? /? = 2.415
,
:
(/?) = (2,415) = 0.9922

:
(*) = *. (*/?) + ?. (*/?)
* = 4.039, (*/ ?) = 0.9922, ? = 1.672 (7),
(*/?) = 0.0216

? (*) = 4.0387(0.9922) + 1.672(0.0216) = 4.043 .
QED.

?? (1985.)

Pattern of spread of extra-early maize varieties in the Sudan savanna ecology of Nigeria

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Abstract

Résumé

Introduction

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1997

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Methodology

Study area

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1997, , 97.5
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95 - 1 ( ) 65 61
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0.5 6 , 3 $_2$0$_5$
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. 1999.
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1997 2000
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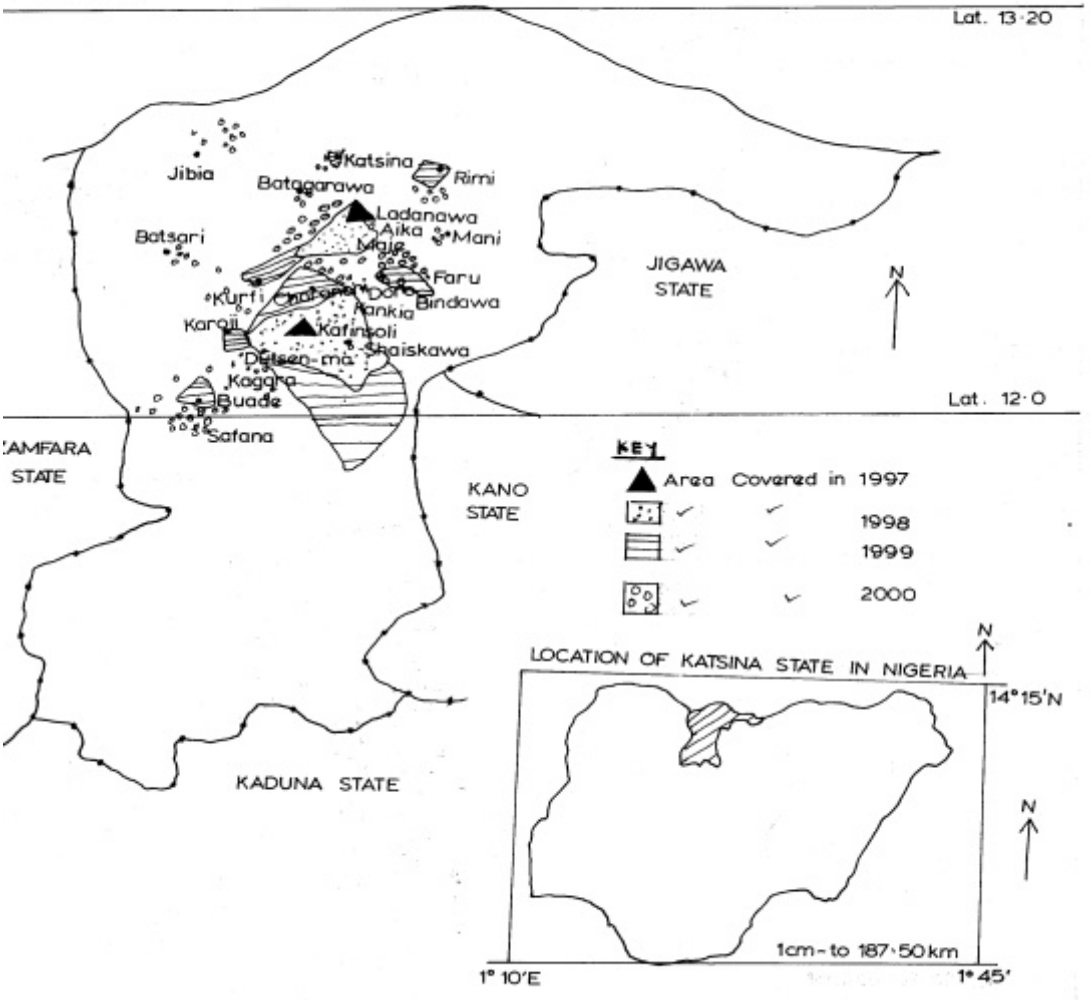
Figure 1: Map of Katsina state showing the pattern of spread of Extra-early maize cultivation between 1997 to 2000.



1999 ,

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3360 95 - 1, 3430 95 - 1.

=45 =75/ ($1 = =90)

2000

=22 =30/ =16 24/ .

Survey

(2000),

20

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(1).

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Table 1. Categories of extra-early maize farmers identified and used in the analysis.

	( )			
*	1997	1998	1999	2000
	58	-	-	-
	-	51	-	-
	-	-	183	-
	-	-	-	172
				464

**First generation-* 1997 .
Second generation- 1998
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Third generation- 1999
/ .
Fourth generation- 2000 ,
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( ), ( ), , , , , , . ( ) -

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Data analysis

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. (1998)

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- ; :

$$Y = ?_o + ?_1 Sex + ?_2 Age + ?_3 Edu + ?_4 FS + ?_5 KepLiv + ?_6 V_1 loca + ?_7 S Seed + ?_8 Plt Patn + ?_9 Yr Cont Crop. + ?_{10} Priss + ?_{11} Qharv 00 + ?_{12} Q sold 00, + ?_{13} AdopC. + ?_{14} Pest Prob + ?_{15} Var + ?_{16} Trend + ?_{17} Fert Prob + ?_{18} Exten Supt + ?_{19} Mkt Priz + ?_{20} Negat + ?$$

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2000

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. (1999) . (1998).

- , ( ), , , (,) (2).

Results and Discussion

Sources of seed of extra-early maize to farmers

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Table 2. List of explanatory variables used in stepwise multiple regression analysis.

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00 / 2000

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Table 3. Sources of seed of extra-early varieties (95 TZEE-W1 and 95 TZEE-Y1) available to farmers in the Sudan savanna of Katsina State, 1997–2000 cropping seasons.

	%			
	1997(=58)	1998(=51)	1999(=183)	2000(=172)
	100 (58)**	-	25 (46)	9 (16)
	-	43 (22)	54 (98)	72 (123)
	-	20 (10)	15(28)	13 (23)
	-	35 (18)	6 (11)	2 (3)
*	-	2 (1)	-	4 (7)

***Figures in parenthesis are the actual number of respondents.*
**Others– Those who obtained the seeds during field days.*

9%
(2000). ,
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43%
1998 54% 1999 72% 2000.
20, 15 13%
1998, 1999, 2000, .

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( )

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(—45 75/)

(=22 000 30 000/)

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Farmers assessment of extra-early maize

Negative attributes of the varieties. 82 172
2000

.

(55%)

- (4).

Table 4. Farmers' assessment of the negative attributes of two extra-early maize varieties in the Sudan and Sahel savanna of Katsina State, Nigeria in 2000.

	%		
	95 - 1 (=36)	95 - 1 (=46)	(=82)
	56 (20)*	54 (25)	55
( )	11 (4)	13 (6)	12
	28 (10)	26 (12)	27
Striga	0	7 (3)	4
	6 (2)	0	2

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Striga

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. *Striga*

(. 1994).

Striga

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(. 1998).

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Positive attributes of the varieties.

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(5).

Table 5. Farmers' assessment of the positive attributes of two extra-early maize varieties in the Sudan and Sahel savanna of Katsina State, Nigeria in 2000.

	%		
	95 - 1 (= 36)	95 - 1 (= 46)	(= 82)
*	58 (21)	54 (25)	56
	19 (7)	13 (6)	16
	6 (2)	11 (5)	9
	6 (2)	7 (3)	6
	11 (4)	15 (7)	13

**Relative to traditional staple crops such as sorghum and millet.*

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Cropping system

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6).

Table 6. Planting pattern of involving extra–early maize varieties use by the respondents.

	%	
	1999 (=183)	2000 (=172)
*	12	14
	33	28
	7	5
	27	34
	18	17
	3	2

*

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(1998).

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Area cropped to extra-early maize

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2.9 1997 155 2000 (7).
95 - 1 95
2 - 1. (2.5-
2.9 /) 2.2-2.5 / 95 -
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(,).
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. 1999 2000 0.67
0.90 / , .
2 5 .
1000%.
(41%),
(34%) (14%).
11%.

Table 7. Estimated area cropped to extra-early maize varieties by respondents between 1997 to 2000.

	1997	1998	1999**	2000**
95 - 1 ( )	1.5	11	49	68
95 - 1 ( )	1.4	1.5	74	87
( )	2.9	26	123	155
	58	51	183	172
( )	0.05	0.51	0.67	0.90

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Spread

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1999
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Determinants of area expansion
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58% .
(00),
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( ) 5%
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- 00 (8).

Table 8. Statistically significant parameter estimates from the stepwise multiple regression of land area cultivated to extra-early maize on several variables in the Sudan and Sahel savanna zones of Katsina State, Nigeria.

		-	^{2}
00	0.493	4.268**	0.563
.	0.389	3.466**	0.553
00	0.413	2.394*	0.439
	0.331	3.273**	0.531
	-0.403	-3.16**	0.522
			0.581

*,** 0.05 0.01 , .

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Conclusion

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- 1 95 - 1)
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References

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1998.

243 252 .
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(.) ***Towards sustainable farming systems in sub-Saharan Africa***.
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, . ., . . , . . , . . , . . .
, . . . 1996.
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, .

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111 .

, . . ., . . , . , . . . , .
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, . , . . 1994. *Striga*
, - *Striga*
Striga
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50 97 *in* . , . . . , . , . .
(.) ***Towards an integrated control of Striga in Africa***. 1 -
Striga ( ), 11 14 1990,
, .

, . ., . . , . , . . 1998.
151 161 *in* . , . ,
. . , . . , . (.)
Towards sustainable farming systems in sub-Saharan Africa.
- , ,
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, ... 1998. -
. 143 150 *in* .
, . , . . , . . , .
(.) ***Towards sustainable farming systems in sub-Saharan Africa***.
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, . ., . . , . . , ...
1999.
. 383 393 *in* . - , . . .
, . , . . (.) ***Impact, challenges and prospects of maize research and development in West and Central Africa***.
, 4 7 , 1999, - ,
. / .

Potential impact of input policy on maize supply in Ghana

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Abstract

Résumé

Introduction

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Model specification and estimation procedure

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, Q, , $W_i (i=1,\ldots,n)$
$lnC=f(lnW_1, \ldots, lnW_n; lnQ)$, lnC
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:

$$\ln C = \beta_0 + \sum_{i=1}^{n} \beta_i \ln W_i + \beta_q \ln Q + \frac{1}{2}\sum_{i}\sum_{j} \beta_{ij}(\ln W_i)(\ln W_j) + \frac{1}{2}\beta_{qq}(\ln Q)^2 + \sum_{i=1}^{n} \beta_{qi}(\ln Q)(\ln W_i) \quad (1)$$

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1978; . 1994).

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$(?_{FL} ? ?_{LF})$:

[5]
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$$\ln C = \alpha_0 + \alpha_F \ln W_F + \alpha_L \ln W_L + \alpha_K \ln W_K + \alpha_Q \ln Q + 0.5\gamma_{QQ}(\ln Q)^2 + \alpha_T T + 0.5\gamma_{KK}(\ln W_K)^2 + \gamma_{QF} \ln Q \ln W_F + \gamma_{QL} \ln Q \ln W_L + \gamma_{QK} \ln Q \ln W_K + \alpha_{FT} \ln W_F T + \alpha_{LT} \ln W_L T + \alpha_{KT} \ln W_K T + \gamma_{QT} LnQT + \alpha_{TT} T \quad (2.1)$$

$$S_F = \alpha_F + \gamma_{FF} \ln W_F + \gamma_{FL} \ln W_L + \gamma_{FK} \ln W_K + \alpha_F \ln Q + \alpha_{FT} T \quad (2.2)$$

$$S_L = \alpha_L + \gamma_{FL} \ln W_F + \gamma_{LL} \ln W_L + \gamma_{LK} \ln W_K + \alpha_L \ln Q + \alpha_{LT} T \quad (2.3)$$

$$R_Q = \alpha_Q + \gamma_{QF} \ln W_F + \gamma_{QL} \ln W_L + \gamma_{QK} \ln W_K + \gamma_{QQ} \ln Q + \alpha_{QT} T \quad (2.4)$$

W_F, W_L W_K ,
, ; S_F S_L
( ); R_Q
( )
. - .
-

(. 1994):

$$\sigma_{ii}^A = \frac{\gamma_{ii} + S_i(S_i - 1)}{S_i^2} > 0. \quad (3)$$

( )

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:

$$MC = \{\alpha_Q + \gamma_{QQ} \ln Q + \sum_i \gamma_{Qi} \ln W_i\} AC \quad (4)$$

W_i i .

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1% ,

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$$\varepsilon_{MC}^{P_F} = \frac{\partial MC}{\partial W_F} \cdot \frac{W_F}{MC} = \frac{AC.\alpha_{QF}}{MC} \quad (5)$$

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:

$$Q = \frac{C}{P} = \alpha_Q + \alpha_{QF} \ln W_F + \alpha_{QL} \ln W_L + \alpha_{QK} \ln W_K + \alpha_{QQ} \ln Q \quad (6)$$

$$F = \frac{C}{W_F} = \alpha_F + \alpha_{FF} \ln W_F + \alpha_{FL} \ln W_L + \alpha_{FK} \ln W_K + \alpha_{QF} \ln Q \quad (7)$$

,

- :

$$\varepsilon_F^{W_F} = \frac{\partial F}{\partial W_F} \cdot \frac{W_F}{F} \Bigg|_{\partial Q = 0} = \left(\frac{\alpha_{FF}}{S_F} \right) S_F = 1 \quad (8)$$

- , ,

(, 1987). ( ) ( ), ( ) , , ( ) :

(1998, 1998; 1985).

:

$$\frac{\partial F}{\partial W_F} \Bigg|_{\partial Q = 0} = \frac{F}{W_F} . S_F = \frac{C}{W_F^2} . \alpha_{FF} = \frac{C}{W_F^2} . S_F \quad (9)$$

( )

( ) , , ( )

:

$$\frac{\partial F}{\partial W_F} \Bigg|_{\partial Q = 0} = \frac{MC . S_F}{W_F} . = \frac{AC . \alpha_{QF}}{W_F^2} . \frac{\partial Q}{\partial W_F} \quad (10)$$

, W_F,

, F,

:

$$\varepsilon_F^{W_F} = \frac{\partial F}{\partial W_F} \cdot \frac{W_F}{F} \Bigg|_{\partial Q = 0} = \frac{\partial F}{\partial W_F} \cdot \frac{W_F}{F} \Bigg|_{\partial Q = 0} = \varepsilon_F^{P_F} = \frac{\varepsilon_S^{W_F}}{\varepsilon_S^F} \quad (11)$$

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, (
1994).

Cost function estimation results

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Table 1. Descriptive statistics of variables used in estimation of elasticities.

(1,000)	554.61	264.68	140.80	1034.20
(1,000)	34.66	16.54	8.80	64.64
(1,000)	17.33	8.27	4.40	32.32
(1,000)	67.02	36.37	15.38	164.72
(1,000 /)	100.49	196.16	0.12	845.67
(1,000 /)	126.56	223.54	0.31	780.00
(1,000 /)	137.48	268.64	0.23	860.00
(1,000 /)	0.43	0.66	0.01	2.05

Note: =29*Sources*: , 1998-2000; , 1998, 1999; , 1998.
= .

Elasticity estimates

3 4 ,
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- (1988;
. 1994; 1986) 5 %
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(3, 4).

$(S_i ? ?_i ? 0)$.

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(. ., $?_Q$? 0),

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Table 2. Maize cost of production estimation results for Ghana using seemingly unrelated regression, 1970–98.

$?_F$	0.726*** (0.117)	$?_{QF}$	0.110 (0.119)
$?_L$	0.002 (0.010)	$?_{QL}$	0.052*** (0.012)
$?_K$	0.272** (0.115)	$?_{QK}$	-0.162 (0.126)
$?_Q$	-0.077 (0.209)	$?_{FT}$	-0.001 (0.004)
$?_T$	-0.015** (0.007)	$?_{LT}$	0.000 (0.000)
$?_{FF}$	0.125* (0.062)	$?_{KT}$	0.001 (0.004)
$?_{FL}$	-0.024*** (0.005)	$?_{QQ}$	0.984 (0.722)
$?_{FK}$	-0.101 (0.061)	$?_{QT}$	0.006 (0.032)
$?_{LL}$	0.050*** (0.002)	$?_{TT}$	-0.002*** (0.001)
$?_{LK}$	-0.026*** (0.006)		2.203*** (0.116)
$?_{KK}$	0.128** (0.061)		

: ; = 29.

,**,** 0.10, 0.05, 0.01 , .

Table 3. Input demand, marginal cost, and supply elasticities for output price and fertilizer prices and quantities under the base case scenario.

	0.398	2.740	0.749
	0.554	0.067	0.379
	0.220	0.184	0.284
	0.725	0.278	0.666
	0.569	0.074	0.357
	0.855	0.793	0.935
	0.137	0.127	0.150
	0.069	0.012	0.057
			0.16
(1,000/)			9.68
(1,000/)			68.89

Table 4. Input demand, marginal cost, and supply elasticities for output price and fertilizer prices and quantities.

-	10%	10%	10%	10%	10%	10%
	0.344	0.516	2.847	2.538	0.798	0.644
	0.579	0.503	0.063	0.075	0.358	0.420
	0.199	0.260	0.179	0.192	0.286	0.272
	0.727	0.717	0.266	0.300	0.645	0.697
	0.594	0.520	0.069	0.085	0.337	0.396
	0.860	0.844	0.799	0.779	0.937	0.931
	0.132	0.147	0.123	0.136	0.144	0.162
	0.070	0.067	0.011	0.015	0.052	0.069
					0.154	0.174
		(1,000/)			10.32	8.60
		(1,000/)			76.07	56.68

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- (. . $?_{QQ}$? 0).

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(1988)[6].

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[6] , - , - . (- - , -). - . - .

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Potential implications of imposing a tax or a subsidy on fertilizer

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10% 1.13 , 60%
(676.9)
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15%. 85% (580.23)
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1.04
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Table 5. Partial analysis of the incidence of a tax or a subsidy on fertilizer on the maize subsector[1].

					[2]
		%		%	
	( )				
(000)					
	34.66	-15.4 (90.7)	29.46	22.4 (40.6)	42.29
[3]	17.33	-15.4 (-90.7)	14.73	22.4 (40.6)	21.14
	554.61	-23.5 (-81.2)	421.50	27.0 (88.5)	704.35
	( )				
	6,769.10		5,802.34		8,258.30
	5,538.35		4,747.37		6,756.79
[4]	0.00		580.23		825.83
[5]	43,425.31		31,807.18		56,591.34
		[6]	-11,618.13		13,166.04

: [1] .

[2] ,
10%.

[3] .

[4] .

[5] .

[6] (11.6) (13.2)
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24%
11.62 .
10
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, 10%

22%,

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22% (1.5)

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825.8

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17%.

27% ( ),

(1990)

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30% (13.2)

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Concluding comments

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10%

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10%
15%,
24%.

. , 10%
17%, 22.4%
27%.
30% .
6%
.
/
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References

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Public Budgeting and Finance 19: 76 89.

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Recent advances in the development and promotion of quality protein maize in Ghana

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Abstract

Résumé

Introduction

(*Zea mays* .)

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50%

(, 1997).

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Kwashiorkor.

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Institutional role in QPM development and promotion

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Historical background of QPM development in Ghana

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1970
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(. 1993). -2
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Recent advances in QPM variety development in Ghana

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1989.
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8363- , (105 110
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1991 1992.
(1), 8363-

. , 8363-
5.5 /
( )
3.5 / (. 1997 ;
- . 1992). ,
3.2 / 3.0 /
, 3.0 / (
). ,

- . 8363- *Obatanpa*
Good Nursing Mother
1992.

Table 1. Essential amino acid contents of quality protein maize (QPM) and normal maize varieties in Ghana and amino acid requirements for children and adults.

		-		1-	-
	---------- /100			----------	
	3.50	2.47	2.78	4.3	2.5
+	4.21	3.70	5.02	4.2	2.5
	4.93	3.39	5.25	5.5	3.5
	3.08	2.36	3.42	4.6	3.5
	9.05	7.92	11.43	9.3	6.5
+	7.40	6.59	5.61	7.2	6.5
	3.60	2.26	3.66	2.6	-
	3.70	2.36	3.10	6.6	5.0
	1.03	0.62	0.61	1.7	1.0
/	2.93	3.35	3.34		
(%)	9.73	9.86	9.87		

/ (1991) .
(1991) .

- ,

1991, 62 63
.
-
1995 1997 (- . 1997). ,
, -
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20 , ,
1995 1996 (- .
1997). -
. *Dadaba*
( ), *Mamaba* ( ) *CIDA-ba* (
) 6.8, 7.3 6.3 / , .

1997 (- . 1997).

Current programs and achievements

Development of extra-early and early QPM

- (75 80) (90 95)

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(. 1997)

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- 10
2000.
- 5.1 /
4.5 / ,
(2). -
, 99-90 - ,
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Development of yellow QPM varieties

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Table 2. Grain yield and agronomic traits of early and extra-early maturing maize varieties evaluated at 6 locations during the 2000 major season.

-					
/					%
9190	5805	48	190	2.0	27
	5767	53	214	2.2	36
-2	5545	49	199	2.3	31
90	5507	47	201	2.2	25
	5237	49	195	2.2	22
90	5227	48	191	2.2	24
9980 -	5220	45	187	2.7	31
9980 -	4987	45	188	2.5	40
16	4752	47	184	2.6	29
	4502	46	191	2.5	39
	4071	59	221	2.8	30
-	3747	47	193	3.1	33
	5031	49	196	2.4	31
(0.05)	349.1	0.8	7.9	0.3	6.9
(%)	3.3	2.8	7.1	18.9	39.0

8766 6,
, ,
; 454 474 .
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1999
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, 9866- 66- .
2000, 9866-
4.85 / 6.24 / (3).
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Table 3. Grain yield and agronomic traits of medium-late maturing maize varieties evaluated at 6 locations during the 2000 major season.

-

	/				%
(3 1368) 5012	6907	54	221	2.5	19
132-28	6435	55	216	2.3	28
	6313	57	223	2.4	19
	6244	53	227	2.3	28
8321-18	6155	55	213	2.3	34
2328-88	6123	52	201	2.3	20
(28 1368) 5012	6076	55	215	2.6	30
110-28	6036	53	205	2.3	32
	6000	58	246	2.2	26
110-5	5874	52	189	2.5	47
	5305	54	195	2.3	23
	5081	54	251	2.4	30
9866	4853	52	208	2.5	31
474	4831	54	205	2.7	19
454	4771	54	196	2.8	26
	3949	57	238	2.7	26
	5685	55	215	2.4	27
(0.05)	504	1.0	9.9	0.3	7.0
(%)	15.6	3.3	8.1	19.5	45.1

Hybrid development

Line development in GH 9163 SR and in EV 8762 SR populations. 62 63
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- , -
. ,
,
. 1997
.
5 9163 6 8762 ,
. , 10
3 9163
9963- 10
8762 9962- . ,
3 8762 9962 -
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Conversion of popular normal maize inbreds to QPM.
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Striga
. 1997
. 20, 22, 24,
1368, 10-1, 4058, 301 9071.
5
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Improvement of released QPM lines.
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, 5, 6, 24, 27, 70, 88, 23,
28 - ,
- 1997. ,
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. 1998
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Promotion of QPM

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On-farm demonstrations. -

2000, - , .

Sensory evaluations.
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, , ,
, 2000.

(. 1995; 1999).

Infant feeding studies.

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(. 1994; . 1994 , 1994 , 1994).
( )

, ( )

, ( )
13.9 16
5.9
, ( ) 29.4%
18.0, 12.6, 12.8% , ,
, ,
(. 1994; .
1994 , 1994 , 1994).

Production of breeder's seed.

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Distribution of Fact Sheets.

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Demonstrations of nutritive value. ( )
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( ) , ( )

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Impact of QPM technology in Ghana

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Adoption of improved maize varieties.
, 90%
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,
90% . , 1000 1400
1996
1998. ,

. 1997, 21%
650 000 (. 1999).

Seed industry development.
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Increased job opportunity.

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Increased utilization of maize.

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1992, 703 600
1998 (,
1999).
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Increased production and consumption of maize.

55 / / .
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Utilization of maize by industries. -
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2000/2001

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Impact of Ghana's QPM in other countries

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Plans for future QPM research and extension

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Conclusion

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References

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- , . . , . . . 1994 .

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31 36.

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1994 . . ***Proc. Ghana Anim. Sci. Symp***. 22: 45 49.

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. . , . . , . - , . . .
1992. ***Development and release of Obatanpa, an intermediate maturing quality protein maize variety in Ghana***. , . . 19 .

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Development and release of three quality protein maize hybrid varieties, Dadaba, Mamaba and CIDA-ba in Ghana. , . . 31 .

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, . . , . , . . , . .
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Factors affecting maize grain quality and fumonisin content in some villages of the western highlands of Cameroon

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Abstract

Résumé

Introduction

(*Zea mays*),
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800,000 (-
1996). (
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(*et al.*, 1997; , 1999).

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(1994).

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Fusarium moniliforme
. (1971)
F. moniliforme
. . (1995) *F. proliferatum*
( ) (34%) *F. moniliforme* (54%),
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F. moniliforme ,
(. 1988; 1996; 1996).

(1996).

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1994; . 1992; . 1990; . 1988;
1995, 1996, 1997; . 1988; .
1992; . 1993; . 1992, 1995;
. 1990; . 1991; 1993; , 1980; .
1992).

Apergillus flavus : .
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(1997) (1998).

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Methods

Sample collection

36
(, ,)
1997.

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800 2500
(1996). 1100

2600 . 1000 1500
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18^0 30^0 .
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Fumonisin analysis

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Data analysis

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Results

Fumonisin contamination

36 , 32
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500 / .

Farming practices

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64%
. 24%

(1).
. 33%

. 3 %
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(*Musa accuminata*)
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Table 1. Farmers' agricultural practices in three villages of the western highlands of Cameroon, 1997 (n = 12 per location).

Harvest period				
	6.9	17.6	8.8	11.1
	13.6	56.5	10.7	23.6
	77.5	25.6	78.6	63.9
	2.0	0.3	1.9	1.4
Cleaning stores				
	90.1	88.9	78.9	85.9
/	9.9	11.1	21.1	14.1
Harvesting				
	80.4	85.6	90.7	85.6
	3.2	1.4	3.0	2.5
	16.4	13.0	6.3	11.9
Sorting				
	21.3	18.2	10.6	16.7
/	78.7	81.8	89.4	83.3
/	21.5	30.6	26.1	26.1
/	18.9	18.4	13.4	16.9
	35.2	14.1	4.6	17.9
	24.4	36.9	55.9	39.1
Storing				
	42.1	54.0	51.9	49.3
	33.5	18.0	7.0	19.3
	14.4	4.8	11.1	10.1
/	7.5	12.9	9.4	9.9
	2.5	10.3	20.6	11.4
Period of drying				
1	67.9	80.0	50.1	66.0
2	20.2	15.3	33.5	23.0
>2	11.9	4.7	16.4	11.0
Use of bad maize				
	34.2	30.7	35.0	33.3
	19.0	23.0	18.0	20.0
	11.4	9.9	8.7	10.0
	35.4	35.4	38.3	36.7

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(77.8 %) ;

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17% .

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, , 33.3%
. 20% .
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10% .
(36.6%)
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(1);
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(19.4%);
. (16.7%);
. - -
, (33.3%);
. (18.1%).

(66%) (23%)
; 11%
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(88.9%)

. 50%
(-),
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(*Cypressus* .).

/ .

(1). (70.6%)
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18.0 % . 20%

, 31.0%
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(9.7%) (9.7%).
; 79.2%
, 12.5%
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16.7%
, 80.6%
. 50%
, 8% , 41% ( ).

(
). (27.4 %),
(44.4%),
(13.9%) 11.1%

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Analysis of factors affecting fumonisin contamination in WHL

2.

Table 2. Parameters from a stepwise multiple regression analysis (backward selection) of crop management factors affecting fumonisin contamination of maize in the Western Highlands of Cameroon in 1997.

		-	-	>
		-170.5	3.54	0.001
		-264.5	2.31	0.006
Sitophilus zeamais		81.9	0.66	0.012
		-672.5	0.81	0.033
		-130.4	0.44	0.041
		-81.9	0.45	0.052
		249.8	0.31	0.149
		-470.1	-1.33	0.192
		938.7	-1.14	0.259
		-329.5	0.10	0.359
		56.2	0.61	0.530
		23.2	0.80	0.701
	= 145.0			
2	= 0.75			
>	= 0.05			

(= 0.001) (= 0.006)

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Sitophilus zeamais (:

), (= 0.0012)

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(= 0.033).

(= 0.041)

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(= 0.052).

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1997
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Table 3. Summary of potential factors affecting fumonisin contamination of maize from rural areas of the Western Highlands of Cameroon, 1997.

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Discussion

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Mussidia nigrivenella (:)
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(1992) *Busseola fusca* (:
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moniliforme. , *S. zeamais* *B. fusca*

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. (1994), (1997) (1998)

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, *A. flavus*
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, *A. flavus*
A. parasiticus
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Aspergillus spp. a
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1997
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20 25⁰
70%. ,
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1997.

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Fusarium .

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Rheeder . (1992).
, 51%
(1994). , ,
F. moniliforme .

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. (1998)
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Aspergillus flavus
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F. moniliforme
A. flavus
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(1994)
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Khaya senegalensis
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(1981)

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Recommendations

To the Institute of Agricultural Research for Development (IRAD)

To the extension services and farmers

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Acknowledgements

99/131/ . .
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16.

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Mussidia nigrivenella (:), *Aspergillus flavus* (:)
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1995. 14 - 1
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. . , . . . 1990.
Fusarium
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Ph.D Thesis: , .

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Qualité comparée des grains de maïs béninois issus des écotypes locaux et des cultivars améliorés : mise au point de tests rapides de sélection

C. Mestres[1], M. Nago[2], J. Hounhouigan[2], et N. Akissoë[2]

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[2]*UNB/FSA, DAVRIEUX Fabrice, CIRAD-CP*

Résumé

Abstract

Introduction

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; , , 10 %
(1992).

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1993).
(1989 ;
1991).

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Aptitude des maïs aux différents modes de transformation utilisés au Bénin ; intérêt du test de friabilité

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(1990):
- , ,
50 % ,
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, 35 % ,
- , ,
15 % .

La production de lifin

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21 1993
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(16)

150 42 %,
51 %
(5) :

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(1) :

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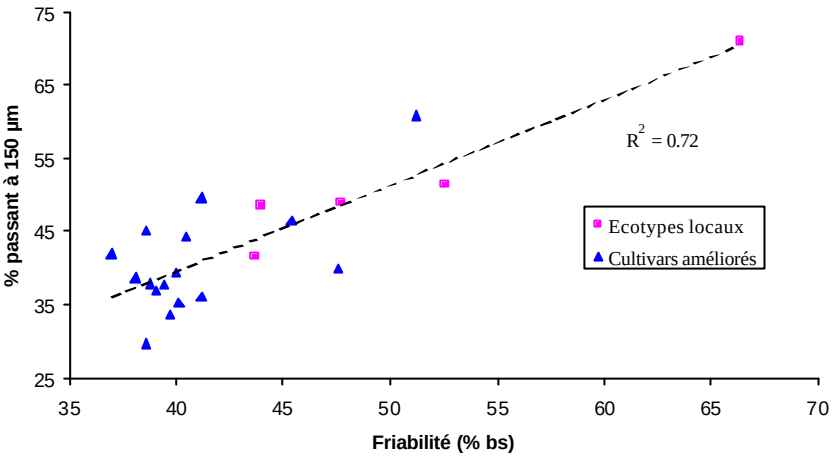

Figure 1. Relation entre friabilité et finesse des farines de maïs (lifin).

La production d'ogui

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(2) (2). (.
2) ,
, (65 %
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La production de mawè et de gritz

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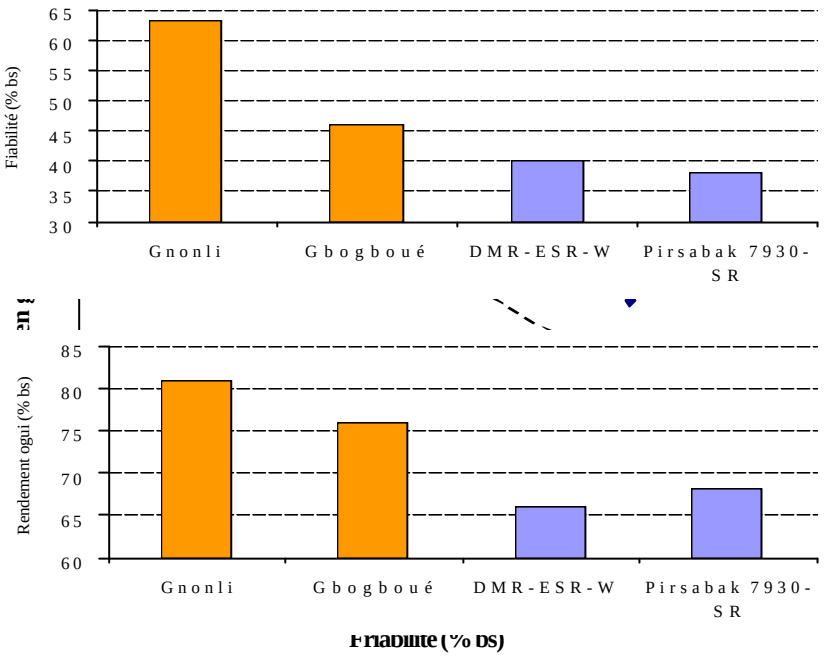

Figure 2. Friabilité et rendement en ogui de quelques cultivars béninois.

Figure 3. Relation entre friabilité et rendement en grits.

La friabilité comme test de sélection

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Un outil très rapide : la Spectrométrie dans le Proche InfraRouge (SPIR)

Principe et mise au point et développement d'une calibration.

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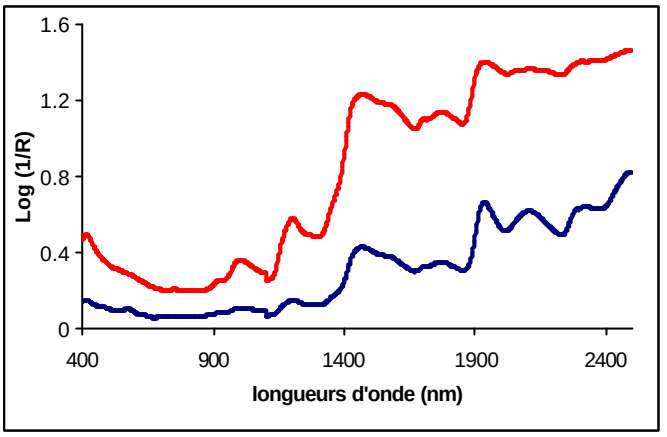

Fig. 4. Exemple de SPIR de grains de maïs

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(4).

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. 200

300 .

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Application au maïs

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(50)

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Tableau 1. Calibration SPIR sur maïs.

	200	0,9	1,3
	209	0,7	0,8
	340	0,3	0,5
	355	0,1	0,3
	213	2,0	2,8

200

355 .

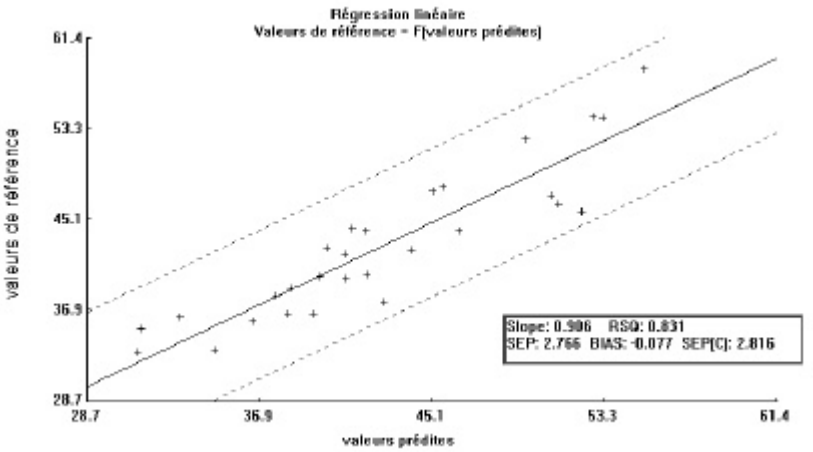

Figure 5. Corrélations entre friabilité prédite et mesurée pour les 30 échantillons de validation.

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(5).

Les potentialités de la SPIR comme outil de sélection

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. 347 357
Le progrès génétique passe-t-il par le repérage et l'inventaire des gènes ? - : ( )

Utilisation du maïs en patisserie au Mali

B.A. Bengaly

Laboratoire de Technologie Alimentaire
IER, BP 2058, Bamako, Mali

Résumé

Abstract

Introduction

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27100 1994 1995 38600
1995 1996 (( ).
1992
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1500 .

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Materiels et Méthodes

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15, 30, 50%.
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(180
200). , ,
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Resultats

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50%

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Tableau 1. Paramètres statistiques de l'évaluation sensorielle du moka à 100% blé.

						-
	3	2	3	4	3	4
	9	9	9	9	9	9
	6.07	6.91	6.18	7.15	5.73	5.16
	1.01	0.97	1.67	1.54	1.32	1.13
	0.78	0.56	0.83	0.67	0.61	0.78

Tableau 2. Paramètres statistiques de l'évaluation sensorielle du moka à 15% de maïs.

						-
	2	2	3	5	6	6
	9	9	9	9	9	9
	6.48	6.69	6.6	7.21	6.73	6.56
	1.71	1.43	1.45	1.34	1.20	1.76
	1.12	0.87	0.23	1	1.1	1.3

9= , 8= , 7 =
6= , 5= , 4= ,
3= , 2= , 1=

Tableau 3. Paramètres statistiques de l'évaluation du moka à 30% de maïs.

						-
	2	4	4	4	5	5
	9	9	7	9	8	8
	7.13	6.45	7.46	7.18	6.92	6.82
	1.67	0.98	0.76	0.78	0.34	1.18
	1	2	5.18	1.45	1.98	0.78

Tableau 4. Paramètres statistiques de l'évaluation du moka à 50% de maïs.

	-					
	4	5	7	5	7	6
	9	9	9	9	9	9
	8.02	7.58	7.87	7.56	7.92	8.32
	1.67	0.98	0.76	0.78	0.34	1.18
	0.89	0.77	1.78	2.10	1.03	0.55

50%

.

(15%, 30%, 50%).

Analyse de marché

9.

Tableau 5. Paramètres statistiques de l'évaluation du croissant de blé pur.

	-					
	4	4	4	5	6	6
	9	8	8	8	9	9
	6.85	5.89	6.76	5.56	7.13	7.67
	1.23	1.65	1.85	1.98	1.47	1.24
	1.12	1.45	4.61	1.54	1.71	2.32

30%

;

50%

.

Tableau 6. Paramètres statistiques de l'évaluation du croissant à 15% maïs.

						-
	5	4	4	5	5	6
	9	9	8	9	9	9
	6.13	5.17	6.12	5.32	7.06	6.77
	1.04	2.42	1.66	1.76	1.33	1.17
	2.15	2.13	1.45	1.19	1.71	0.97

Tableau 7. Paramètres statistiques de l'évaluation du croissant à 15% maïs.

						-
	4	4	4	6	6	6
	9	9	8	9	9	9
	6.23	5.34	6.55	5.12	6.65	6.45
	1.8	1.95	1.78	1.73	1.86	1.26
	2.34	1.65	0.97	0.89	0.89	1.12

Tableau 8. Paramètres statistiques de l'évaluation du croissant à 30% maïs.

						-
	3	4	3	4	5	5
	9	9	8	7	7	8
	5.98	5.12	6.15	5	6.62	6.39
	1.23	1.62	1.55	1.44	1.34	1.11
	1.56	1.17	0.75	1.13	0.55	1.12

Tableau 9. Paramètres statistiques de l'évaluation du croissant à 50% maïs.

	3	4	3	4	3	4
	8	8	8	7	7	8
	5.77	5.07	6.03	5.01	6.22	6.11
	1.09	1.31	1.42	1.14	1.12	1.02
	1.66	2.31	0.99	1.05	1.89	2.57

Évaluation du coût des différents produits

Table 10. Coût- bénéfice de la préparation des pâtisseries de farine composée et de blépure.

Patisseries	100% BLE			Farine composee		
	Gâteaux	Croissants	Moka	Gâteaux	Croissants	Moka
Quantité de blé(g)	50	50	50	40	40	40
Quantité de la farine de mais (g)	0	0	0	10	10	10
Coût de la farine de blé(FCFA)	15 000	15 000	15 000	12000	12000	12000
Coût de la farine de sorgho(FCFA)	0	0	0	2000	2000	2000
Coût des ingrédients (CFA)	2200	2275	8813	2000	2275	8813
Total coût (x)(CFA)	17 200	17 275	23 813	14 000	14 275	22813
Nom bre de produits	3000	2500	1002	3000	2500	1002
Revenue provenant des produits (y)(CFA)	60 000	50 000	40080	60 000	50 000	40080
Bénéfice net (CFA)	42 800	32725	16 267	46 000	35 725	17 267

Conclusion

,

50 % .

.

Bibliographie

, ., . , . . , . . , . .
. 1998.

. ***African Crop Science Journal*** 6(1):1 7.

Mechanization of maize degerming for mawè production

D.J. Hounhouigan[1], H.G. Sekpe[1] A.P. Kayodé[1], C. Mestres[2], and C.M. Nago[1],

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[2]*CIRAD-CA,BP 5035, 34032 Montpellier cedex 1*

Abstract

Résumé

Introduction

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Materials and Methods

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13%

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13%
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Dehulling and Degerming: 2
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Mawè production.
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Performance measurements

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= - / 100, = ( ),
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105 .

Chemical analysis

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(1984).

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Physical analysis

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90, 250 355 .

Results and Discussion

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(39.6%)
(74%) (70%).

Table 1. Effect of residence time and sample size on fine grit yields of three maize varieties produced from the Maquina degermer compared with the traditional processing method.

		(%)		
	( )	13	15	
-	6	56.2 ( )	53.6 ( )	
	7	60.3 ( )	58.8 ( )	64.9
	6	59.9	61.5	
	7	59.1	61.5	66.7
	6	39.6	42.8	
	7	-		-

Table 2. Effect of residence time and sample size on total grit yields of three maize varieties produced from the Maquina degermer compared with the traditional processing method.

		(%)		
	( )	13	15	
-	6	73.1 ( )	74.1 ( )	
	7	67.7 ( )	68.7 ( )	64.9
	6	65.6 ( )	70.2 ( )	
	7	63.0 ( )	66.2 ( )	66.7
	6	39.6 ( )	42.8 ( )	
	7	-	-	

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(*et al*., 1997 ; . 1999).

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15 /6

(15 /6) 70 74%.

(66%)

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(. 1999).

1%,

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15 /7 13 /7

(3).

Table 3. Efficiency of the Maguina d'Andrea degermer under the best operating conditions.

Type of mawè	Energy consumption (kWh/kg)	Grit yield (%w/w)	Fat (%)	Degerming rate (%)	Dehulling rate (%)	Unbroken grit (%w/w)
15 /7	0.05	66.2	0.9	78.7	89.3	4.7
13 /7	0.05	67.7	0.8	82.2	86.8	7.4

66.2% 67.7%
0.5 .
0.9%
0.8% .
1% (. 1993).

15 /7

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(4)
(15 . 4 .)

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Table 4. Particle size distribution of traditional mawè and maquina mawè at different soaking duration.

( )	> 355	250 ?	< 355	90 ?	< 250	< 90
Mawè 4hrs (Traditional)	**5,5**		**4,4**		**19,7**	**70,4**
6	15,3		3,8		20,5	60,4
8	14,4		8,6		20,4	56.6
10	14,0		8,6		18,6	58,8
12	12,2		4,6		20,4	62,8
Mawè 15 hrs	**5,6**		**5,4**		**18,9**	**70,1**
24	3,5		4,12		21,6	70,7
48	3,9		4,6		19,1	72,4

5.
* ( ), * ? (
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,
(. 1993).

Table 5. Comparison of colour parameters of traditional and maquina-mawè.

			-	-
*	80.6?0.0	89.8?0.4	83.9?0.1	90.6?0.1
*	2.7?0.1	2.6?0.0	2.1?0.05	1.7?0.0
*	12.6?0.5	10.2?0.2	8.3?0.0	5.1?0.1
?	26.5?0.0	18.6?0.1	21.3?0.1	14.1?0.1

(6). (- 95)

(- 95)
.

Table 6. Comparative study of pasting characteristics of traditional and maquina-mawè.

			- -	
	76.1?0.3	87.9?2.0	54.5?0.7	62.5?2.0
95	57.1?0.0	68.6?1.3	45.4?0.5	53.6?1.6
	91.6?0.0	109.4?2.2	78.0?1.2	93.5?2.2
- 95	1 9	19.3	9.1	8.9
- 95	39.9	40.8	32.6	39.9

= , 95 = 15
95 , = 50 , - 95 =
, - 95 = .

(. 1987).
(.
1997). ,
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et al. (1998)
(1992) .

(7).
3.4.
3.6 4.2
(. 1993).
(3.5 4.5) (1972; 1970).
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(7).

. 4.7% ,
1% 0.9
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Conclusion

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13%,
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Table 7. Proximate composition of corn, traditional and maquina-mawè.

			- -			
	3.4?0.0	3.3?0.0	3.4?0.0	3.3?0.0	-	-
	2.1?0.01	2.3?0.02	2.1?0.02	2.3?0.02		
(%)	9.4?0.04	9.1?0.14	9.8?0.1	9.6?0.11	10.8?0.0	10.6?0.0
(%)	1.2?0.01	0.9?0.0	1.1?0.03	0.8?0.0	4.7?0.0	4.5?0.0
(%)	0.7?0.02	0.5?0.01	0.8?0.02	0.6?0.02	1.1?0.0	2.0?0.0
(%)	0.32?0.00	0.33?0.02	0.36?0.02	0.34?0.01	1.5?0.0	0.5?0.0
(%)	88.4	89.2	87.9	88.6	81.9	82.4

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Aknowledgement

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Méthode de base pour l'évaluation sensorielle des aliments. , ., . 57 68.

Effect of synthetic and botanical products on seed viability and seedling vigor of maize from two agro-ecological zones of Cameroon

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Abstract

Résumé

Introduction

( ) (*Zea mays*)
,
, .
(1995)
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2.0 / (1998).
750 000 , ; 30 000
(. 1999).

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(. 1987; . 1981; .
1995). (1993) 5
50%
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(1981) 150 +

. 1994
( )
35 2%
.

. (1995)
10 ,
(*Cymbopogom citratus*)
. *et al.* (1998)
75.8%
Thymus vulgaris.
, (1989)
Cymbopogom citratus

. , *Ocimum*
gratissimum 10 60%.
(1995)

Azadirachta indica .
(1996) *A. indica*

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( ) .
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( ) (, ,

12% .
95% .
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(. .,
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Data analysis. 4- (, , ,
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2.

(120, 150, 180, 210, 240).

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Results and Discussion

Experiment 1

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3- (, ,)
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( ).

. 120 ,
(=90%)
88% 30 .
,
(1).

Table 1. Mean squares from orthogonal contrasts for germination percentage between groups of treatments applied to maize seed harvested from the humid forest zone of Cameroon and stored for different periods in 2000.

	( )				
	120	150	180	210	240
+ + + (+)	0.188**	0.651**	0.743**	0.942**	0.988**
(+) (+ +)	0.445	0.432	0.255	-1.409	0.734
+ + (+)	0.560	4.502**	9.618**	11.468**	11.368**
+(+) +	-0.498	-2.234	-4.279**	-3.412**	-4.468**

*, ** = 0.05 = 0.01
= 50 , = 2% , = 35 , =

,

(1).
0.188 120 0.998 240 .

.

2% (+)
. ,
35 ( )
150- 240-
(1). 35 50 (+
)
.

, 90%
120 44% 240 (2).
120 240 ,
87% 120 28.5% 240
(. 1),
.
(50% 120
80% 240).
.

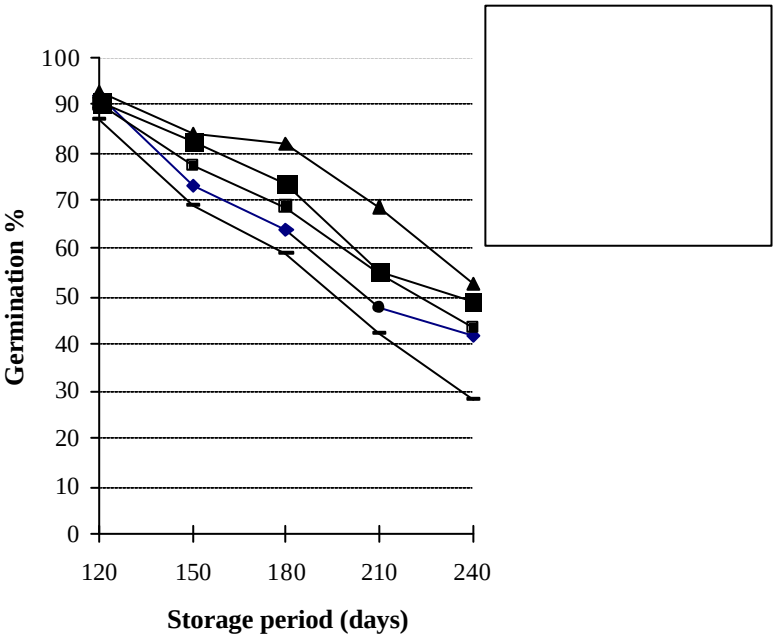

Fig. 1. Germination % of humid forest maize seeds as influenced by seed dressing and length of storage period.

Table 2. Effects of chemical seed treatment, dosage, and length of the storage period on the germination percentage of maize seed harvested from the humid for

Table 3. Effects of chemical seed treatment, dosage, and length of the storage period on the percentage of abnormal seedlings of maize seed harvested from the humid forest of Cameroon in 2000.

			( )			
		120	150	180	210	240
50	1	2.7	2.5	4.7	5.8	7.3
( )	2	3.0	2.3	4.2	3.8	4.0
	3	3.0	2.0	4.3	4.3	5.3
	4	2.3	2.3	3.0	4.0	11.0
2%	1	3.8	3.5	2.8	5.3	7.0
( )	2	3.3	3.7	3.5	3.5	6.3
	3	2.5	3.0	3.3	4.8	9.8
	4	2.3	3.0	4.5	4.0	9.0
35	1	3.3	3.3	5.0	6.3	8.5
( )	2	2.3	2.5	8.5	6.8	8.0
	3	1.8	3.0	4.8	9.5	8.5
	4	1.8	2.3	4.0	2.8	11.0
+	1	2.0	2.5	3.3	2.8	7.8
(+)	2	2.0	3.0	5.0	3.3	7.5
	3	2.0	4.5	4.3	3.8	6.0
	4	1.5	3.0	3.5	4.5	7.5
		3.0	4.5	3.8	2.3	4.3
		2.5	2.8	4.3	4.5	7.5
. .		46.6	30.6	34.7	38.3	30.7
(0.05)						

1= (10 /1 20 200 , 50 100 , 800 100 , 60 100). 2=0.5 1, 3= 2 1, 4=0.03 % . , 0.05 .

Table 4. Effects of chemical seed treatment, dosage, and length of the storage period on the height (cm) of seedlings of maize seed harvested from the humid forest of Cameroon in 2000.

				( )		
		120	150	180	210	240
50	1	5.4	3.8	6.2	6.6	8.6

Table 5. Effects of chemical seed treatment, dosage, and length of the storage period on the radicle length (cm) of seedlings of maize seed harvested from the humid forest of Cameroon in 2000.

		( )				
		120	150	180	210	240
50	1	9.8	9.4	10.2	10.8	10.8

. ,

(6).

, ,
(>90%) 120- (7).

(7). 35 , +
35 , 35 + *T. vulgaris*, 35 + *O. gratissimum*
. 8935 ,

Fig. 2. Effect of seed dressing and storage period on the germination percentage of maize seeds harvested from the savanna zone of Cameroon.

Table 8. Effects of seed treatment and length of the storage period on the percentage of abnormal seedlings of maize seed harvested from the savana zone of Cameroon in 2000.

	( )				
	120	150	180	210	240
	1.0	5.3	7.0	7.8	5.5
	4.0	3.0	7.8	6.5	6.0
25	0.5	2.8	3.0	4.5	3.5
	1.5	3.5	3.5	6.8	5.8
	1.0	5.3	4.8	7.0	6.5
+	1.0	3.5	5.3	2.5	1.8
O. gratissimum	2.5	4.5	4.3	2.5	7.5
T. vulgaris	2.0				

. *A. indica* 73.3
240- ,
.

Table 9. Effects of seed treatment and length of the storage period on the seedling height (cm) of maize seed harvested from the savana zone of Cameroon in 2000.

			( )	
120	150	180	210	240
3.5	4.2			

Conclusion

240 ,
(72 %)
(44.3 %).
,
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,
,
.
180 .
180 ,
.
240 ,

35 , + 35 , 35 +
T. vulgaris, + *O. gratissimum*. 30
35 100 ,
35

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(*Cymbopogom citratus*). ***International Biodeterioration and Biodegradation***: 81 84.

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29 2 1995, , , .

Description of the dehumidified dryer

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Seed storage experiment

, 200
72 - (0.2
, 6 10) - .
,
100 ,
11.0% 200
72 - (0.2
). , 144 ,
, (10? /80% . .)
(21 31? /68 86% . .) 18 .
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1. 8.0% (21 31? /68-86%
. .).

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Matériels et Méthodes
Matériels
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Méthodes

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10%

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Mise au point des produits finis: ***Le « douédé*** .

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250 500
100 50 .

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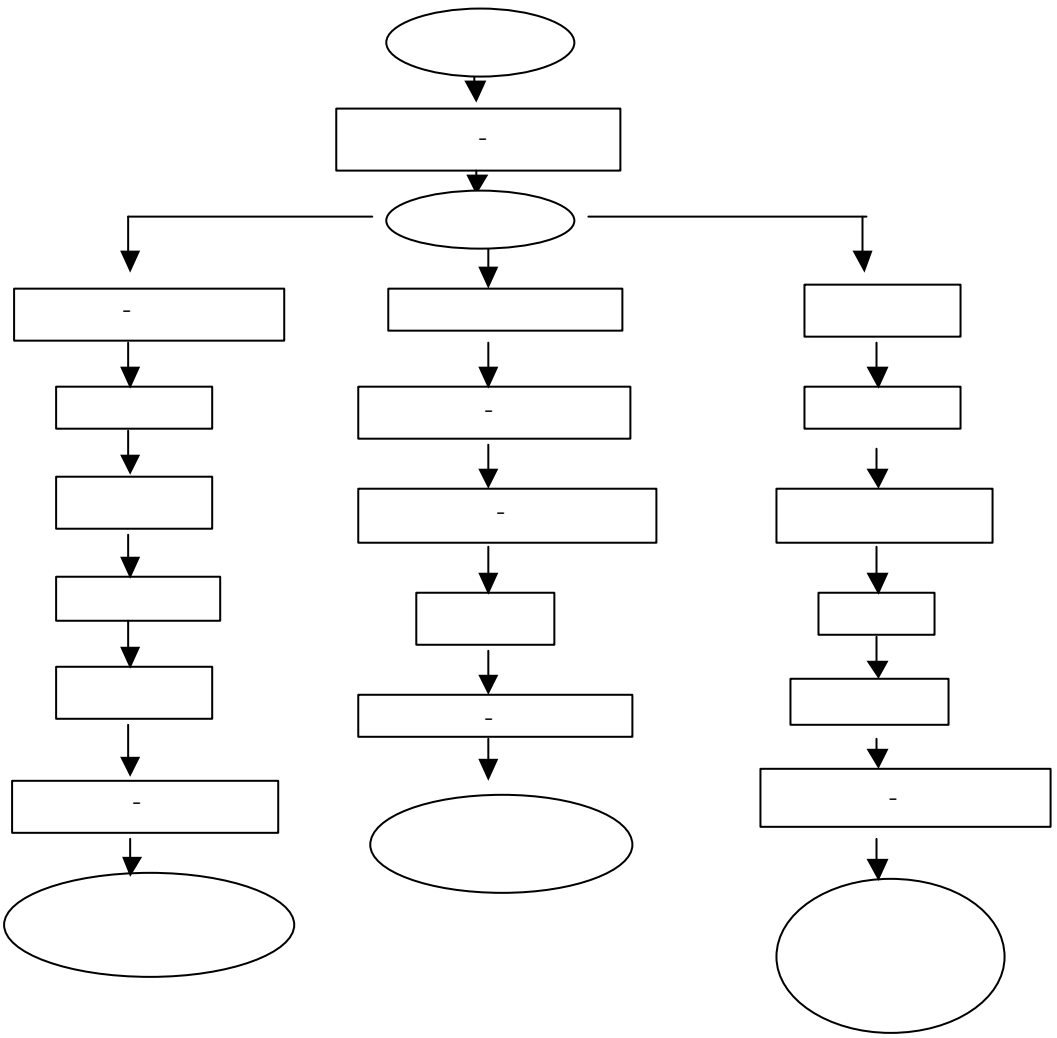
1



30%.
55% (/)
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Le « Soumbiam»

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30 : 50 : 20 .
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250 25 30 .
3 .

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Le « kissar»

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48 ,
.

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28% ,
40 15% (
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9% 12%
5 , 40%
. 27%
5
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9% ,
, 50 .

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20% .

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Le beignet. , ,

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Le biscuit

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(15%) 2 ,
1 , 1
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,
250 25 30 .

Farine infantile.

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,
60 ; 20 ; 12 8%.

Résultats et Discussion

Caractéristiques physico–chimiques et technologiques

Tableau 1. Caractéristiques physico–chimiques des variétés de maïs utilisées.

-

	%	%	%		1000 ( )
84 202	11,18	49,50	75	97	206,24
	10,26	48,70	80	98	164,08
8602	9,69	44,80	85	98	208,07

,
.
3
. ,
24
51,02% .

.

Le « douédé »

, 30% 70%
,
, ,
3 (84 202 : 13,13%; : 12,96%; 8602 : 11,09%) , 10,01%).
,
(2).

Tableau 2. Paramètres Technologiques des «douédés » mixtes par rapport au « douédé » à base de blé pur.

		( )	*	* (%)
84 202	300	165	260,61	13,13
8602	300	165	265,94	12,09
	300	165	261,10	12,93
	300	165	273,92	10,01

* =

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,
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8602
( ),
84 202,
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,
,
8602
(2,9 3,1 3,0).
84 202 (3,5).
(3).
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, 3 ,
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, :
9602,
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Tableau 3. Résultats des tests de cuisson des "douédés mixtes" comparés au témoin.

Variétés	Pl* douédé (g)	Vol eau de cuisson (ml)	PF(**) douédé (g)	PF/Pl	Couleur après cuisson	Aspect eau de cuisson	Comporte -ment
	100	100	288,04	2,88			
84 202	100	100	345,01	3,45			
8602	100	100	307,99	3,08			
	100	100	298,99	3,0			

(*) :
(*) : ( ).

Le « Soumbiam »

3

: 30% ,
50% 20% .

; - -
84 202,
8602.

,
8602
84 202
(4).

, ,
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Tableau 4. Paramètres observés sur les “ soumbiam” de maïs par rapport à ceux de sorgho.

					(%)
84 202	30: 50:20		+		23
	30: 50:20	-	+		27
8602	30: 50:20	-	+		25
	30: 50:20	+			22

(*) - : 30%
- : 50%
- : 20%

Le "kissar” 3

. ,
,
(5)

Tableau 5. Paramètres observés sur les kissars de CMS 8602, Kouri et IB 84 A202.

Variétés	P.T. des composants	Nb. Des PF (**)	P.T des PF	PU des PF	Couleur	Tenue	goût
IB 84 A202	39 27 g	14	1.600 g	114	Blanche	Bonne+	Acceptable ++
Kouri	39 27 g	14	1.686 g	116	Brunâtre	Bonne+	Acceptable ++
CMS 8602	40 77 g	18	2.141 g	119	Jaune	Bonne+	Acceptable ++

(*) .
(**) .

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. 84
202
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8602 0,53 0,42
84 202 0,41.

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84 202,
8602,
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Les beignets. 3
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106,34%.
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Le biscuit.

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8602 84 202. 2

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3
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3
- :

- : 15%
- : 35%
- : 25%
- : 25%
- : , ,
.

Farine infantile.

3 ,
.

3
,
.
:

- : 60%
- : 20%
- 8%
- 12%

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Conclusion

2000
2001 , 8602
84 202 (80 %)
(47,66).

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, 8602
,
.
84 202 8602.

(101)

.

Bibliographie

( ), . 1997. ***Nutrition des jeunes enfants et de leurs mères au Tchad***.

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Effect of dehumidification and storage conditions on the longevity of maize seed

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Crops Research Institute. PO Box 3785, Kumasi, Ghana.
[2]*Crops Research Institute, PO Box 3785, Kumasi, Ghana.*

Abstract

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Résumé

Introduction

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(. 1998).

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(1972). ,

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75% (1998),

Description of the dehumidified dryer

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Seed storage experiment

, 200
72 - (0.2
, 6 10) - .
,
100 ,
11.0% 200
72 - (0.2
). , 144 ,
, (10? /80% . .)
(21 31? /68 86% . .) 18 .
:

1. 8.0% (21 31? /68-86%
. .).

2. 8.0% (10? /80% . .).
3. 11.0% (21 31? /68 86% . .).
4. 11.0% (10? /80% . .).

2 2 (2)
, .
.
18 .

- -
- .
(3, 1368, 9071, 5, 6, 70),
(3 1368 6 70), 3-
(3 1368) 9071 (6 70) 5 ,
( ).

11.0% 8.0%

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3 6
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Germination test

, 100

. , -
(105? 24) ,
(30).

27 32? .
4 5
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(1981).

($38
,),
,

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Results and Discussion

18 ,
8.0% 96.7%
4.1% (

1).

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Table 1. Effects of percent seed moisture content (% MC) and storage conditions on germination of the maize variety, Obatanpa over a period of 18 months.

%		3	6	9	12	15	18
		.	.	.	.	.	.
		----------			, %	----------	
8		96.7	94.4	95.4	94.7	94.6	95.4	93.6
	(21-31^0 /68-86% . .)							
8		96.7	96.3	95.4	94.0	96.2	96.1	96.5
	(10^0 /80% . .)							
11		96.7	95.1	93.4	91.4	75.8	61.7	40.3
	(21-31^0 /68-86% . .)							
11		96.7	96.4	95.1	95.5	96.3	96.6	95.8
	(10^0 /80% . .)							
		96.7	95.6	94.8	93.9	90.7	87.5	81.6
		0.00	0.48	0.48	0.89	4.99	8.59	13.76

,

11.0%

96.7% 40.3%, 56.4

. 11.0%

, ,

95% 18- .

, 4

13 (

2).

13 ,
11.0%
,
. 15 18 ,
8.0%
.
11.0% ,
8.0%
11.0% .

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,
(
1972).
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(3). ,
8.0%
95.0%, 11.0%
.

Table 3. Effects of variety, percent seed moisture content (% MC) and storage period on the seed germination of eleven maize varieties.

	8.0%			11.0%		
		3	6		3	6
	----------			, % ----------		
Inbred lines						
3	97.5	99.5	95.0	96.5	95.5	87.0
1368	95.5	99.0	99.5	99.5	96.0	66.0
9071	99.0	98.0	100	98.0	98.0	92.0
6	96.5	97.5	95.0	96.5	97.5	80.5
7	93.0	96.5	97.5	96.5	92.5	73.0
70	98.0	96.5	95.5	98.0	97.0	83.5
Single-crosses						
3 1368	95.0	100	98.0	98.5	97.5	80.0
6 70	95.5	99.0	97.0	98.5	98.0	84.0
Three-way crosses						
(3 1368) 9071	95.5	99.0	99.0	98.5	98.5	95.0
(6 70) 5	100.0	98.5	97.5	99.5	100	88.0
OPV						
	98.0	98.0	98.0	99.5	97.5	92.5
	96.7	98.3	97.5	98.1	97.4	80.5
	0.61	0.35	0.52	0.36	0.84	4.12

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Summary and Conclusions

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(*Vigna unguiculata*)
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Workable Approach No. 4.
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An approach to rapid deployment of agricultural technologies—Transfer of downy mildew resistant maize to farmers in Ogbomoso, southwest Nigeria

S.O. Ajala, V.M. Manyong, V. Adenle, K.O. Makinde, A. Akintunde, J. Olufowote[1], M. Bolaji[2], and B. Bolaji[2]

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PMB 5320, Ibadan, Nigeria
[1]*World Vision International,*
PO Box 1490, Kaneshie, Accra, Ghana
[2]*Oyo State Agricultural Development Project,*
Zonal Office, Ogbomoso, Oyo State, Nigeria.

Abstract

Résumé

Introduction

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Elements of the new strategy

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Multi-institutional collaboration to put complementary efforts in place

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Identification of a niche for the technology

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Active farmer participation

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Farmer empowerment

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Interaction among farmers

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Case Study

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Choice of area and deployment strategy

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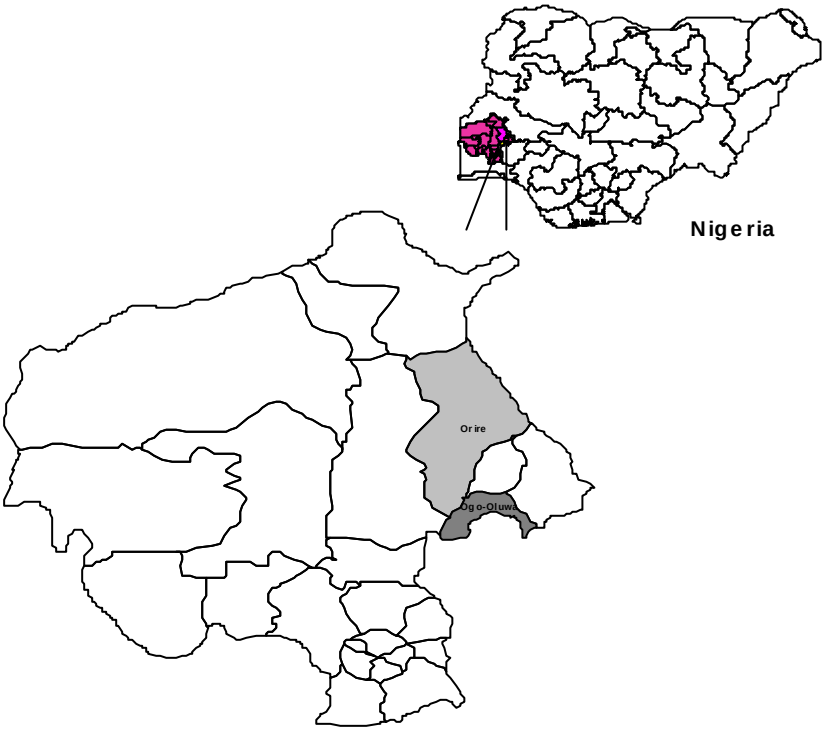

Figure 1. Map of Oyo State of Nigeria showing the study area.

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Results and Discussion

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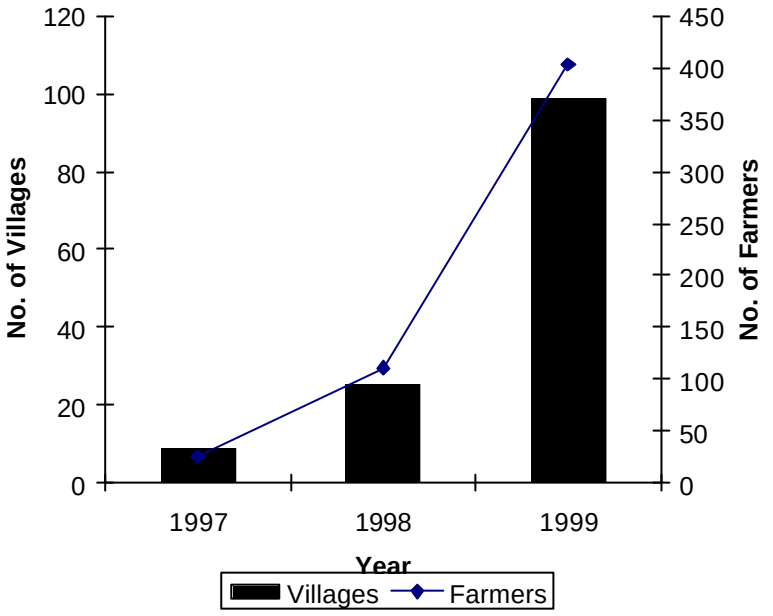

Figure 2. Number of villages and farmers that participated in the dissemination of DMR maize varieties in Ogbomoso, 1997–99.

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1997 1999.

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1999, . ,

3.8 , 95%

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2207 -1 1997 2929

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1999 31% 1997
56% 1998.

Table 1. Grain yield and economic profitability of DMR maize varieties in Ogbomoso, Nigeria, 1997-99. (*All fields at full costs).

	1997 *n=25*	1998 *n=109*	1999 *n=487*
( )	0.71	0.66	0.57
(/)	2207	1847	2887
(—/)	18996	33647	19858
(—/)	40458	23258	32929
(—/)	21462	-10389	13071
	2.13	0.69	1.65
BC ratio (% farmers)			
< 1.00	8.0	80.7	20.3
1.00 < < 2.00	40.0	19.3	46.8
> 2.00	52.0	0.0	32.9

**Cost of family laboiur included.*

Table 2. Grain yield and economic profitability of DMR maize varieties in Ogbomoso, Nigeria, 1997–99 (All fields at cash costs).

	1997 *N = 25*	1998 *N = 109*	1999 *N = 487*
( )	0.71	0.66	0.57
(/)	2207	1847	2887
(—/)	13555	21447	15040
(/)	40458	23258	32929
(—/)	26903	1811	17889
	2.98	1.08	2.19
BC Ratio (% Farmers)			
< 1.00	10.5	45.9	11.5
1.00 < < 2.00	50.8	40.4	35.0
> 2.00	38.9	13.8	53.5

Economic benefits

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Economic benefits over all maize fields

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(—18 996) 1997
1999 (—19 589). 1998, 77%
170% —400 1997
—1080 1998. 1997
(—21 462), 1998 (-—10 389). ,
- ( ) 1998 (0.69),

2.13 1.65
1997 1999, .

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90% 1997
80% 1999 - , 80%
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Economic benefits due to intervention

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1999 3.
33%
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140% - .

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Table 3. Economic profitability of DMR maize varieties in fields with or without intervention at Ogbomoso, Nigeria, 1999.

		intervention
	n=393	*n=94*
( )	0.54	0.71
(/)	2929	2713
(—/)	19649	20736
(—/)	34590	25982
(—/)	14941	5246
	1.76	1.25
< 1.00	17.0	34.0
1.00 < < 2.00	47.8	42.6
> 2.00	35.1	23.4

Effect of project experience on economic benefits

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Table 4. Effects of farmers' experience on the profitability of growing DMR maize varieties in Ogbomoso, Nigeria, 1998–99.

	1998		1999		
		1		1	2
	n=87	*N=22*	*n=420*	*n=47*	*n=20*
( )	0.61	0.86	0.57	0.56	0.65
(/)	1707	2398	2932	2466	2936
(—/)	32748	37199	20117	17656	19615
(—/)	21321	30917	32850	32470	35670
(—/)	-11427	-6282	12733	14814	16055
	0.65	0.83	1.63	1.84	1.82
BC ratio (% farmers)					
< 1.00	48.3	36.4	21.7	10.6	15.0
1.00 < < 2.00	40.2	40.9	46.0	55.3	45.0
> 2.00	11.5	22.7	32.4	34.1	40.0

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Spill-over effects of intervention

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Table 5. Spillover effects of growing DMR maize on fields with and without intervention in Ogbomoso, Nigeria, 1997–99.

	With intervention			Without intervention		
	New	1 Year	2 Years	New	1 Year	2 Years
	n=338	*n=40*	*n=15*	*n=82*	*n=7*	*n=5*
( )	0.53	0.53	0.72	0.73	0.74	0.44
(/)	2988	2381	3046	2699	2955	2607
(—/)	19948	17828	17756	20811	16674	25191
(—/)	34617	33386	37205	25566	27229	31065
(/)	14669	15558	19449	4755	10555	5874
	1.74	1.87	2.10	1.23	1.63	1.23
BC ratio (% farmers)						
< 1.00	18.6	7.5	6.8	34.1	28.6	40.0
1.00 < < 2.00	46.4	60.0	46.6	43.9	28.6	40.0
> 2.00	34.9	32.5	46.6	22.0	42.8	20.0

Farmers perception of benefits

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92%
96% - .

66%
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95%
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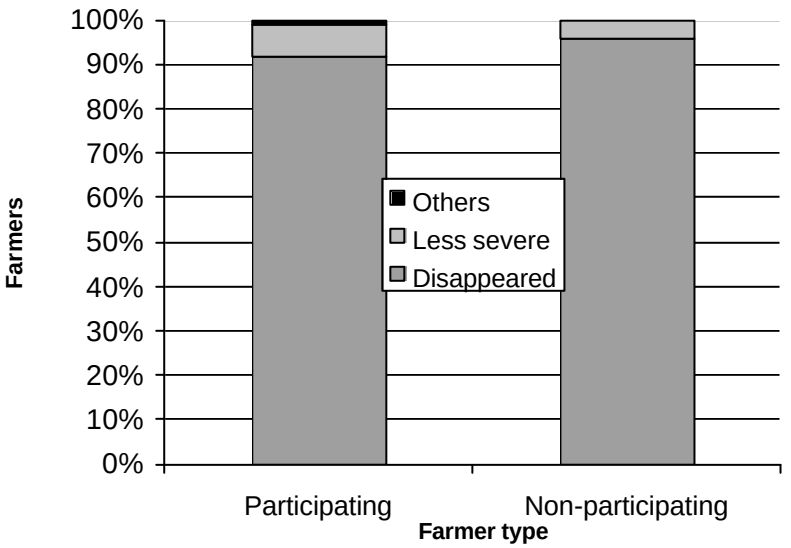

Figure 3. Perception of the current level of downy mildew incidence by participating and non-participating farmers in a DMR maize variety intervention in Ogbomoso, Nigeria, 2000.

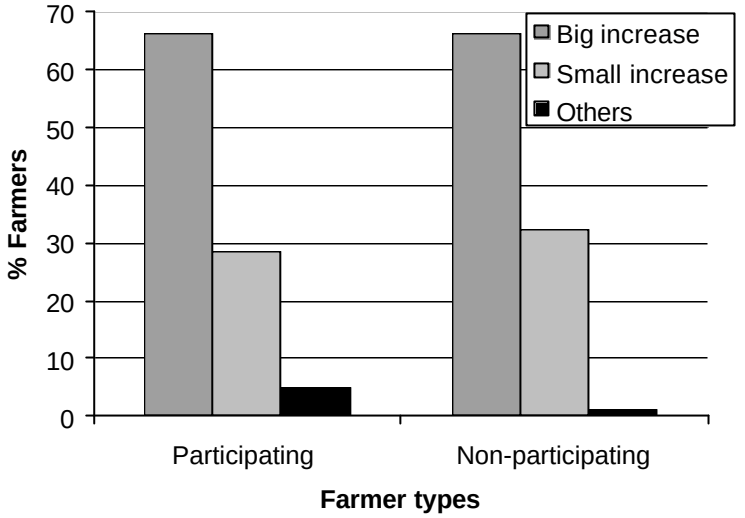

Figure 4. Effect of DMR varieties on maize grain yield as perceived by participating and non-participating farmers in a DMR maize variety intervention in Ogbomoso, Nigeria, 2000.

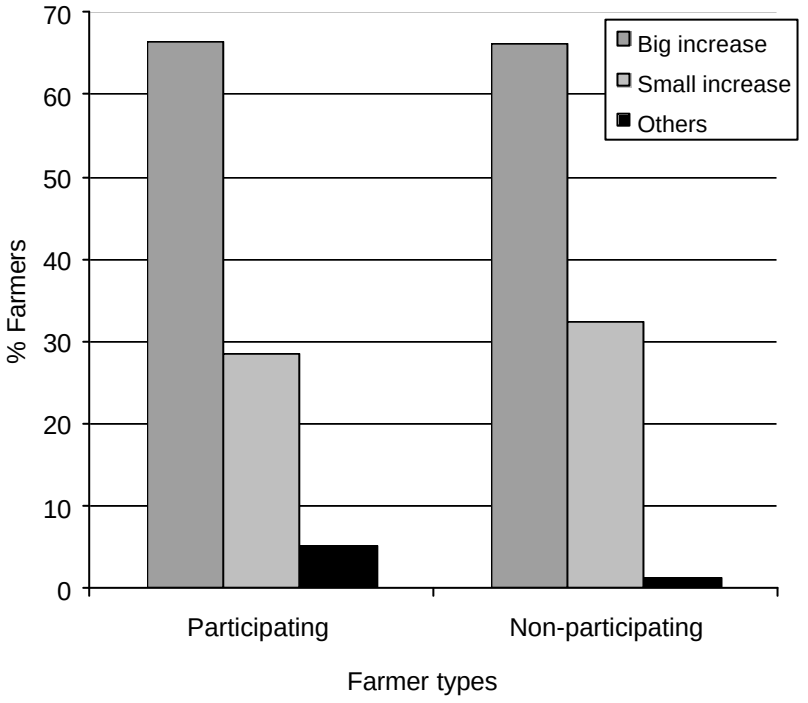

Figure 5. Effect of DMR varieties on income from maize production as perceived by participating and non-participating farmers in a DMR maize variety intervention in Ogbomoso, Nigeria, 2000.

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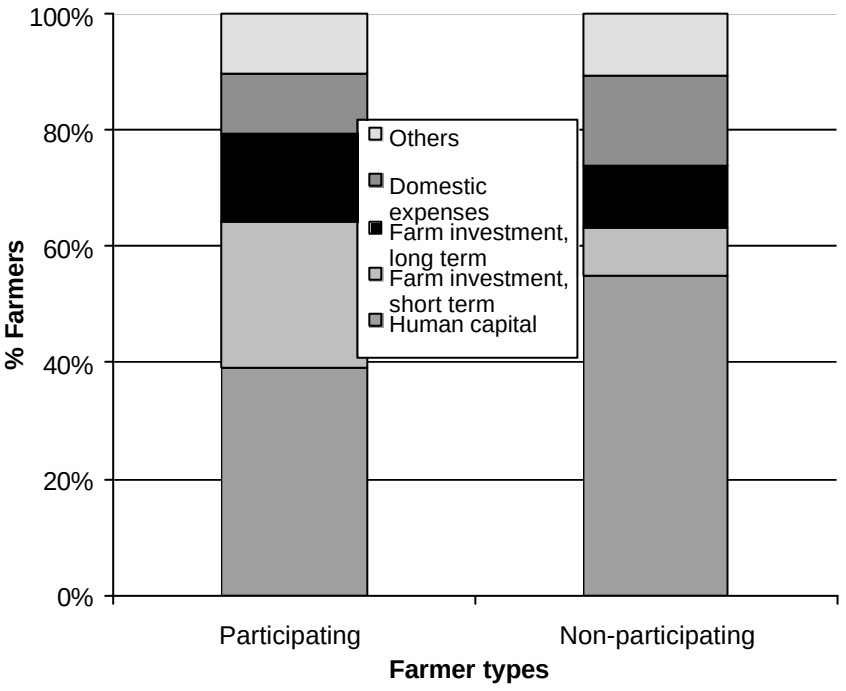

Figure 6. Uses made of additional income by participating and non-paticipating farmers in a DMR maize variety intervention in Ogbomoso, Nigeria, 2000.

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Indirect benefits

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Conclusion

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, , 1988.

Enhancing the capacity of National Agricultural Systems for maize research and development in West and Central Africa: Accomplishments of WECAMAN and planned activities for the immediate future

B. Badu-Apraku[1], M.A.B. Fakorede[2], S.O. Ajala[3], R. Obubo[3] and C. Okafor[3]

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[2]*Obafemi Awolowo University, Ile-Ife, Nigeria*
[3]*IITA, Ibadan, Nigeria*

Abstract

Résumé

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21 .

Methodology

Identification of training needs

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1999, 2001 (

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Table 2. Title, year, duration and number of participants in WECAMAN training courses for scientists, 1991–2000

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	1995	2	27
Striga	1995	2	8
	1996	1	15
	1996	2	17
	1998	2	11

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Advanced statistical computing courses for breeders and agronomists.

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Workshop on farmer participatory methods of on-farm testing and evaluation of varieties.

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Workshop on maize quality, processing and utilization.

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Workshop on impact assessment of maize stress management technologies.

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Participants' evaluation of training courses and Workshops

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Pre- and post-course evaluation of the participants.

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Daily and overall course evaluation by the participants.

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Knowledge acquired , , ?
Usefulness/relevance , , ?
Depth of coverage , , ?
Presentation , , ?
Training material , , ?
Time allotment , , ?

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Data summarization.

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Results

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Table 3. Attitudinal changes of NARS resulting from WECAMAN training courses and workshops in WCA.

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Course evaluation by participants.

(23%) / (77%).

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(41%)

, (81%)

(5).

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(6).

Table 4. Overall course assessment by participants in WECAMAN courses.

		/	/
	.. %		
	0	23.0	77.0
(= 61)			
	3.1	28.1	68.8
(= 64)			
	6.4	35.5	58.1
(= 62)			

Table 5. Extent to which WECAMAN course objectives were met and the benefits of the courses as rated by participants.

	.. %		
? (=246)	3.7	41.1	55.3
(=62)	1.6	17.7	80.6

Table 6. WECAMAN Course design and delivery as rated by course participants.

				/
1.	(=63)	0	12.7	87.3
2.	(=62)	1.6	19.4	79.0
3.				
(=65)		3.1	24.6	72.3
4.				
(=61)		23.0	50.8	26.2
5.	(=37)	21.6	75.7	2.7
6.	(=62)	5.4	27.0	67.6
7.	(=45)	6.7	35.6	57.7
8.	(=23)	4.3	91.4	4.3
9.				
(=51)		23.5	39.2	56.9
10.	(=62)	51.6 (*two short*)	38.7 (*about right*)	9.7 (*too long*)

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(7). 52%
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Table 7. Views of WECAMAN course participants on time allotment for course activities.

1.	(=38)	21.0	73.7	5.3
2.	(=35)	28.6	71.4	0
3.	/ (=36)	40.0	56.7	3.3
4.	/	22.2	77.8	0

Table 8. Support facilities and arrangements of WECAMAN courses as rated by participants.

Course execution item	Poor	Satis-factory	Good/ Excellent
1. (=63)	1.5	41.2	57.3
2. (=22)	18.2	40.9	40.9
3. (=19)	10.5	31.6	57.9
4.			
- (=38)	10.5	21.0	68.5
- (=33)	9.1	18.2	72.7
- (=8)	62.5	25.0	12.5
5. (=62)	8.1	25.8	66.1
6. (=59)	18.6	40.7	40.7
7. (=23)	4.3	60.9	34.8
8. (=61)	26.2	21.3	52.5
9. (=54)	24.1	42.6	33.3
10. (=14)	0	21.4	78.6
11. / (=38)	52.6	23.7	23.7

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Discussion

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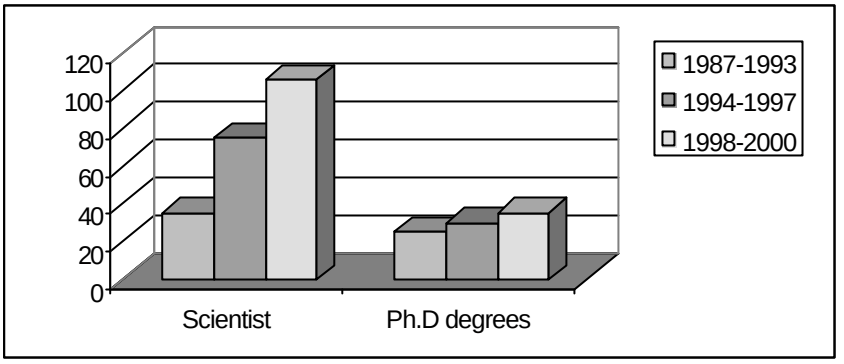

Figure1. Number of scientists involved in the collaborative research projects of WECAMAN and number with Ph.D. degrees in the 1987–1993, 1994–1997 and the 1998–2000 eras.

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Planned training activities of WECAMAN for the immediate future.

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75 (41%)
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Table 9. Number of workshops and training courses planned for WECAMAN, 2003–2005.

Type of training activity	2003	2004	2005	Approximate number of participants
				22
				16
				22
				22
				13
				120
	-			3
	-			2

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