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MAIZE EXPERIMENTATION, 1983 :
PRELIMINARY RESULTS

633.1
GWA

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by

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633.1
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I.1. MAIZE PRE-EXTENSION TRIALS (EPV)
1983

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2. Objectives

- 2.1. To test the adaptation of promising new varieties to the farm environment of the semi-arid North, under intensive cultural practices as applied by cotton farmers.
- 2.2. To test varietal response to two different levels of chemical fertilizer.

3. Experimental Design

- 3.1. Statistical model : Multilocal Split Blocks
- 3.2. Number of replications : 2 per location.
- 3.3. Number of locations : 6
- 3 in the Northern Cotton Region (Maroua - Mora),
 - 3 in the Center Cotton Region (Kaélé - Yagoua).
- 3.4. Main Treatments : 4 test varieties, plus 2 observation varieties in border plots.
- 3.5. Entries : 1. TZPB K.81
 2. Mexican 17 Early
 3. TZPB General Population (Ck.)
 4. SAFITA 2-B (Ex-Pool 16)
 5. N C A (Border)
 6. Farmers' locals. (Border)
- 3.6. Sub-Treatments :
- A. Classical cotton fertilization (53-30-30) :
 - 200 Kg/Ha 15-15-15 at seeding,
 - 50 Kg/Ha 46-0-0 at 40 JAS.
 - B. Economical test formula (61-15-15) :
 - 100 Kg/Ha 15-15-15 at seeding,
 - 50 Kg/Ha 46-0-0 at 40 JAS.
- 3.7. Cultural Practices : Uniform package consisting of cotton precedent, ox-plowing, timely precision row planting, timely thinning (to 62,500 plants/Ha), two weeding, two ridgings.

4. Results

4.1. Yields

The mean yield performance of varieties is presented in Table M- 0 for 6 locations, and varieties by fertilizer treatment is presented in Table M- 1 for 4 locations. (see 4.3) The sources of yield variance are analyzed in Table M- 2.

Across six locations, maize yields varied primarily in function of environment, and across four locations, in function of fertilizer treatment. Interactions were not statistically significant.

4.2. Varieties

Although varietal yield differences were not statistically significant, two entries yielded slightly more than the check (TZPB). Mexican 17 Early outyielded TZPB at all six locations for an average gain of 17%, and SAFITA 2-B outyielded TZPB at 5 locations for 16% average increase. Mexican 17 E and SAFITA 2-B were 5 and 12 days earlier in maturity, respectively, and averaged 13% greater prolificity than the check.

Minor yield differences between the general population of TZPB and the K.81 selection are attributed to plant population differences and to experimental error.

4.3. Fertilizer

Fertilizer sub-treatments were misapplied at two of the six locations (Mouda and Kodek). Interpretation of fertilizer response is based on the four locations where its application was correct. Varietal response to the fertilizer treatments is reported in Table M- 1.

Over 4 locations, the economical fertilizer formula (61-15-15) gave a highly significant increase in maize yield compared to the classical cotton formula (53-30-30). Except for the entry NCA, maturity duration, plant population and prolificity were not significantly influenced by the change in fertilizer, whereas lodging rate was slightly reduced.

5. Discussion and Conclusions

Under the very dry conditions of the 1983 season, the relatively high maize yields obtained by farmers are attributable primarily to their strict observance of the cultural calendar and protocol. The yields are best interpreted as potential performance in the farm environment

and are not typical of normal production.

Varieties with a maturity cycle of more than 100 days were relatively disfavored in terms of yield by the short and dry 1983 season. These results underscore the advantage of earliness in maize varieties for the Extreme North. The adaptation of Mexican 17 Early to these conditions is confirmed, although its maturity cycle averaged 98 days. It proved relatively vigorous, disease free, Striga tolerant, prolific, and resistant to lodging.

Fertilizer response should be interpreted in the context of the crop rotation applied, where residual P and K from fertilizer applied to the cotton precedent supplied part of the maize crop's needs. The yield increases from the 61-15-15 treatment are more attributable to the distribution of nitrogenous fertilizer over time than to the 15% increase in total nitrogen applied. The 61-15-15 treatment applies 75% of its nitrogen at 40 days after planting, versus 43% for the classical 53-30-30 formula.

These results merit wider reconfirmation across soil types and climatic conditions before any change in recommendation is made.

FIGURE N° 1
GEOGRAPHIC
DISTRIBUTION
OF EPV TRIALS, 1983.

Distribution
géographique des
EPV 1983.

● VILLE PRINCIPALE
MAJOR TOWN

▲▲▲ ZONE MONTAIGNEUSE
MOUNTAINOUS AREA

□ ZONE INONDABLE
FLOOD PLAIN

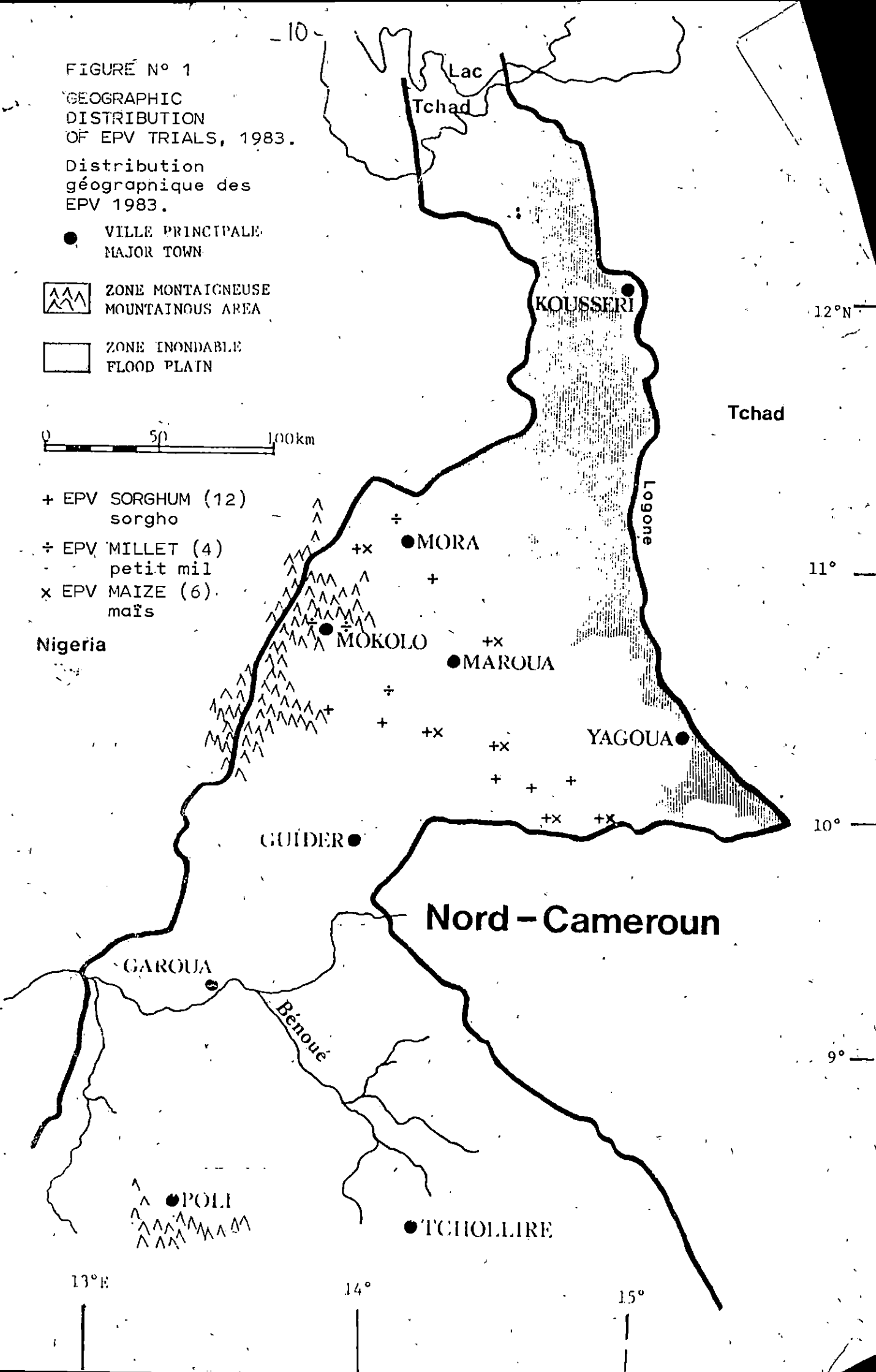
0 50 100km

+ EPV SORGHUM (12)
sorgho

÷ EPV MILLET (4)
petit mil

x EPV MAIZE (6)
maïs

Nigeria



13°E

14°

15°

12°N

11°

10°

9°

TAB. N° M-1

MEAN GRAIN YIELDS BY SUB-TREATMENT IN EPV MAIZE TRIALS, 1983, FROM 4 SITES^{1/}
 Rendements-grain moyens par sous-traitement en EPV maïs, 1983, de 4 localités.

VARIETY Variété	SUB-TRT ^{2/} Sous-Trt	YIELD/PLANT Rdt./Plante (grm)	YIELD/Ha Rdt./Ha. (Kg)	% CK. % Tém.	% GAIN 61-15-15	% LOSS/perte 53-30-30
TZPB K.81	53-30-30	39.4	2261	92		- 21
	61-15-15	51.8	2875	100	+ 27	
MEXICAN 17 E	53-30-30	47.0	2660	108		- 17
	61-15-15	55.4	3219	112	+ 21	
TZPB Ord. (Ck.)(Tém.)	53-30-30	42.6	2465	100		- 14
	61-15-15	48.6	2870	100	+ 16	
SAFITA 2-B	53-30-30	48.8	2724	111		- 17
	61-15-15	58.1	3288	115	+ 21	
N C A	53-30-30	46.7	2642	107		- 4
	61-15-15	47.8	2766	96	+ 5	
FARMER LOCALS Locales des cultivateurs	53-30-30	44.2	2375	96		- 30
	61-15-15	63.5	3405	119	+ 43	
MEAN Moyenne	53-30-30	44.8	2521 a	102		- 18
	61-15-15	51.2	3070 b	107	+ 22	

^{1/} Nguétchéwé, Doyang, Dziguilao, Tchatibali.

^{2/} 53-30-30 : 200 KG/HA 15-15-15 AT SEEDING + 50 KG/HA UREA AT 40 JAS.
 200 Kg/Ha 15-15-15 au semis puis 50 Kg/Ha d'urée à 40 JAS.
 61-15-15 : 100 " " " " 100 " " " "

TAB. N° M-2

SIGNIFICANCE OF SOURCES OF YIELD VARIANCE IN EPV MAIZE TRIALS, 1983.
 Signification des sources de variance des rendements en EPV maïs, 1983.

VARIANCE	6 LOCATIONS / localités				4 LOCATIONS / localités			
	df ddl	F CALC.	SIGNIF.	CV %	df ddl	F CALC.	SIGNIF.	CV %
ENVIRONMENT, E Milieu	5	35.49	HS**	17	3	33.44	HS**	19
VARIETY, V Variété	3	1.97	NS	33	3	0.79	NS	34
FERTILIZER, S Engrais	1	0.01	NS	62	1	72.26	HS**	9
V x E	15	0.25	NS		9	0.24	NS	
V x S	3	0.12	NS		3	0.03	NS	
S x E	5	0.32	NS		3	0.01	NS	
S x V x E	15	0.44	NS		9	0.26	NS	

NS = no significant differences at 5%.
 = différences non-significatives à 5%.

*S = significant differences at 5%.
 = différences significatives à 5%.

**HS = highly significant differences at 1%.
 = différences hautement significatives à 1%.

II.1. MAIZE PREPARATION AND TASTE TESTS (TPD)

1983

2. Objectives

- 2.1. To test grain of promising maize varieties for ease of preparation for local dishes ("ni'iri" or boule de maïs), using the traditional methods of the farm family.
- 2.2. To test promising maize varieties for sensory qualities related to eating local dishes "ni'iri", as prepared by the farm family.

3. Experimental Design

- 3.1. Statistical-model : Multilocal RCB.
- 3.2. Number of replications : 3 per location (farm family)
- 3.3. Number of locations : 6
- 3.4. Treatments : 6 test varieties including local check. (see Part I)
- 3.5. Data format : Rating scale from 0 (low, slow or bad),
to 5 (high, fast, good).
- 3.6. Test Criteria (where applicable to local methods) :
 - Preparation qualities including pounding and winnowing, water absorption, grinding, and cooking time (scored by farmer's wife).
 - Taste qualities : odor (in cooking), appearance, taste, and handling qualities (scored by farmer).

4. Results

4.1. Preparation qualities

Scores registered by farmers' wives for the four preparation criteria were averaged to determine composite preparation scores by variety. Mean scores across the six locations are presented in Table M- 3.

Although varietal differences in ease of preparation did not reach statistical significance, two varieties were rated fairly easy or quick to prepare: TZPB K.81 and Mexican 17 Early. Their floury dent grain type rendered them easier to pound and to grind, and they absorbed more water than the more vitreous grain types.

4.2. Taste qualities

Scores registered by farmers for the four sensory taste criteria

.../...

were averaged to obtain composite taste scores by variety. These data are presented in Table M- 3.

Significant differences in taste quality were reported by the participants. Most highly rated was the variety Mexican 17 Early, which along with TZPB and SAFITA 2-B achieved an average score above 4 on a scale of 5. These three varieties proved significantly superior in taste qualities to NCA and farmers' locals. Consistently high ratings for appearance of ni'iri and for taste contributed to the high ratings for the top three varieties.

5. Discussion and Conclusion

Although maize is inherently more difficult to prepare by local methods into ni'iri than sorghum, these results suggest that the excellent eating qualities of certain varieties may contribute to greater general popularity of maize in the Extreme North. By overcoming consumer resistance associated with the grain type of earlier varieties like NCA, farmers may be more amenable to growing maize for home consumption as well as for market, and the market price may improve.

These results reconfirm earlier findings of Mlle SALINGER which suggested the superior preparation and taste qualities of Mexican 17 Early and TZPB K.81.

TAB. M-3

TPD MAIZE 1983/84: FARMERS' EVALUATION OF PREPARATION AND TASTE QUALITIES BY VARIETY.

TPD Maïs 1983/84: Appréciations des cultivateurs des qualités de préparation et de dégustation par variété.

VARIETY Variété	MEAN PREPARATION ^{1/} Score	GRAIN COLOR Couleur	MEAN TASTE SCORE ^{2/} Dégustation
TZPB K.81	3.08	White Blanc	3.79 a b
MEXICAN 17 E	3.02	"-	4.28 a
TZPB Ord (ck)	2.62	"-	4.05 a
SAFITA 2-B	2.95	"-	4.15 a
N-C A	2.86	Mixed Mixte	3.26 b
FARMER LOCALS Locales des cultiv.	2.59	Various Divers	3.37 b
MEAN Moyenne	2.85		3.82
LSD 5%, vars ppds CV %	0.58 (NS) 17.1		0.28 HS 12.5

1/ MEAN SCORE ON SCALE FROM 0 (LOW) TO 5 (HIGH) OVER 11 LOCATIONS. PREPARATION FACTORS: EASE OF POUNDING & WINNOWING; WATER ABSORPTION, GRINDING AND COOKING, AS RATED BY FARMERS' WIVES.

Notes moyennes sur l'échelle de 0 (bas) à 5 (haut) sur 11 localités. Facteurs de préparation: facilité de pilage et de vannage, absorption d'eau, écrasage, et cuisson, notés par la femme du cultivateur.

2/ TASTE FACTORS: ODOR (AT COOKING), APPEARANCE, TASTE, AND HANDLING QUALITIES, AS RATED BY FARMERS.

Facteurs de dégustation; Odeur à la cuisson, présentation, goût, et tenue dans la main, notés par le cultivateur.

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