RESULTS OF PRELIMINARY INVESTIGATIONS ON SUNFLOWER CULTIVARS AT SAMARU, NIGERIA

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INTRODUCTION

The need to obtain another crop to serve as a source of vegetable oil to complement groundnut in Nigeria which incidentally recorded a very sharp decline in production in recent years has motivated the need for research in sunflower. Sunflower is reported to be tolerant to drought and adapts to various soil types. For this reason, it is hoped that varieties adapted to different ecological zones of the savanna could be developed.

Since sunflower is not an indigenous crop in Nigeria, germplasm materials have to be introduced from different sources. Collection, development and evaluation of sunflower germplasm were initiated in the last three years. The materials available are being evaluated. More than 45 accessions of sunflower have been introduced from different sources. The available materials include 31 hybrids from Canada, 8 hybrids from Romania, 4 hybrids from the United States of America, two varieties from Zimbabwe and one variety from the United Kingdom. Some of these materials have been grown at Samaru (Location : 11°11′ N, 07°38′ E).

In planning for a breeding programme, it is of paramount importance to become acquainted with the potentialities of the germplasm materials so as to select those that are sufficiently distinct from one another and have sufficient genetic variation for direct use. For this reason, a knowledge of variation in agronomic and morphological traits is very important. The objective of this experiment was therefore to evaluate several accessions of sunflower grown in a common environment so as to identify types with adaptive characters. The adapted types would then be selected for use in breeding programmes.

MATERIALS AND METHODS

The experiment was conducted under field conditions at the Institute for Agricultural Research Farm, Samaru, Nigeria. The experimental material consisted of the cultivars obtained from different sources. A randomised complete block design with four replications was used for the experiment. The plot consisted of four 75 cm ridges of 3.0 m length. Three seeds were sown per hole at a spacing of 30 cm within rows. The seedlings were later thinned to two plants per stand at first weeding. Data from five random plants were recorded at harvest on plant height, number of leaves per plant, head diameter and stem diameter at one metre height. Days to maturity, per cent lodging and yield were recorded on plot bases. The data collected were statistically analysed.

RESULTS AND DISCUSSION

The mean performance of the cultivars grown in the savanna environment is presented in Table 1. The wide range of variability in yield obtained indicated that selection could produce adapted varieties comparable to what is obtained elsewhere in terms of seed yield. The yield per hectare ranged from 1.98—32.89 quintals and averaged 15.08 q/ha. The hybrid Do 725 gave the highest yield while the lowest yield was recorded for Giant Yellow. It has been reported (D e d i o, 1985), that 13 sunflower hybrids tested at Manitoba, Canada between 1982—1984 gave a yield range of 18.37—24.64 q/ha with hybrid Cargill 207 giving the highest yield while Saturn gave the lowest yield. Also V r â n c e a n u *et al.* (1982) reported that the performance of Sunbred 265 over 14 different locations in the world gave a mean yield of 24.1 q/ha in 1980—81 with a range of 8.4—37.80 q/ha. The open pollinated variety Peredovik gave a yield of 12.20 q/ha which was lower than what was reported by V r â n c e a n u *et al.* (1984) which was 24.1 q/ha in 1982—83.

The head diameter ranged from 12.75—28.00 and averaged 19.71 cm. The range of the head diameter falls within the values obtained elsewhere. The variety Peredovik which was re-

Table 1

Mean performance of sunflower accessions at Samaru in 1985

Variety/ Hybrid	Plant height (m)	Stem diam. (cm)	Head diam. (cm)	No. of leaves per plant	% lodging	Seed yield per hectare (q)	Days to maturity
Do 725	1.65	1.98	24.00	31	10.78	32.89	89
Do 855	1.70	1.70	18.00	30	3.43	30.19	89
Smena	1.89	2.20	27.50	34	24.17	26.12	92
Sorem 80	1.94	1.58	18.50	39	16.96	25.00	89
S 448	1.57	2.03	23.00	24	4.68	24.99	94
S 316	1.98	1.86	21.00	30	9.95	24.42	94
SigCo 445	1.55	2.08	23.25	28	2.47	22.56	99
894	1.69	1.95	22.50	27	1.27	22.40	97
Sun M 20	1.56	1.55	16.25	26	18.95	21.08	88
S 166	1.63	2.10	18.75	18	10.46	19.57	92
Ro 1197	1.63	2.18	23.00	26	10.51	19.50	94
Funtua	1.90	2.23	24.25	33	3.96	18.18	97
Cargill 205	1.52	1.65	16.25	27	15.86	17.67	88
Ro 4242	1.74	1.70	19.25	29	2.58	16.93	98
Sunbred 265	1.49	2.33	20.25	22	0.63	16.64	89
VNIIMK 8883	1.79	1.60	20.00	30	10.22	16.47	88
S 1888	1.71	1.90	23.25	28	7.86	16.11	94
Morden 21	1.30	1.30	17.00	20	10.45	16.02	88
Ro 59	1.88	1.75	16.50	31	17.08	14.75	88
Do 705	1.41	1.10	12.75	24	12.49	14.63	89
Issanka	1.62	2.05	28.00	31	1.20	14.23	87
Cargill 206	1.84	1.85	19.75	31	6.06	13.93	96
IS 7111	1.63	1.33	13.25	25	2.57	13.78	89
Cargill 207	1.65	1.90	19.75	31	6.30	13.73	88
Ro 1206	1.82	2.08	18.50	27	7.41	13.55	95
Do 321 E	1.82	1.60	17.00	31	3.22	13.23	88
Peredovik	1.90	2.10	23.75	38	6.66	12.20	97
Mirasol	1.65	1.95	21.75	28	2.50	11.85	89
Cakinskij 268	1.68	1.73	20.00	25	25.82	11.80	96
J 501	1.68	1.68	18.00	27	5.40	11.65	89
Do 730	1.80	1.73	18.75	30	12.97	11.63	88
Cernianka 66	1.35	1.73	20.25	25	19.91	11.27	88
PNR 405	1.82	1.90	19.25	32	7.00	11.10	98
Select	1.70	1.45	15.25	27	15.87	10.68	94
IS 3001	1.83	1.85	19.50	29	4.03	10.27	89
IS 7101	1.83	1.78	20.50	30	14.69	10.23	91
Super	1.73	1.68	17.25	29	12.88	9.56	89
Do 734	1.81	1.50	16.50	32	7.57	9.46	89
IS 7000	1.28	1.44	17.75	21	23.68	9.23	88
SigCo 450	1.81	2.13	18.00	32	7.43	9.06	90
Francelever	1.95	1.93	17.50	28	13.91	8.69	90
MRS 27	1.69	1.68	18.50	27	10.73	8.54	89
Saturn	1.49	1.83	24.75	22	0.83	8.51	99
Luciole	1.60	1.70	18.75	21	35.40	2.66	97
Giant Yellow	1.96	2.08	21.50	36	4.17	1.98	101
Grand Mean	1.70	1.82	19.71	28	11.09	15.08	92
S.E. ±	0.02	0.04	0.41	0.44	1.01	1.41	0.38
LSD 5%	0.48	0.76	9.23	12.43	5.99	8.80	11.26
LSD 1%	0.63	1.01	12.23	16.49	7.72	12.00	14.9
Range	1.28—1.96	1.10—2.33	12.75—28.00	18.00—39.00	1.2—35.4	1.98—32.89	87.25—101.0

ported by Vrânceanu *et al.* (1984) to have a range of 14—27 cm for head diameter and a mean of 20 cm, recorded a mean head diameter of 23.75 which is slightly higher than what was reported. The total number of leaves per plant ranged from 18 for S 166 to 39 for Sorem 80. The mean number of leaves per plant was 28.12. The stem diameter at one metre height range from 1.10—2.33 and averaged 1.82 cm.

The plant height at harvest ranged from 1.28—1.96 and averaged 1.70 m. For the variety Peredovik, a mean height of 1.90 m was obtained although a mean height of 1.69 m was reported in the F.A.O. co-operative trials by Vrânceanu *et al.* (1984). The range reported by them for the variety was 1.23 to 2.05 m which was wider than what we recorded. The wider range recorded by them might have been caused by the large number of locations used in conducting the trials. For Cargill 205 a range of 1.09—1.70 and a mean of 1.41 m was reported. We observed that Cargill 205 gave a range of 1.40—1.67 and a mean of 1.52.

The days to maturity ranged from 87 to 101 and averaged 89 days. It was reported by Dedio (1985) that 13 U.S. hybrids had a maturity range of 112—120 days at Manitoba, Canada between 1981—1984. The earliest hybrid reported was Sun M 20 (112 days) while the latest hybrids matured in 120 days and were S 316, SigCo 448 and Cargill 207. It was also reported by Vrânceanu *et al.* (1982) that Peredovik matured between 82—148 days with a mean of 114 days while Sunbred 265 matured within 77—148 days with a mean of 113 days. The results recorded by us showed that in general, the cultivars matured earlier at Samaru than at their places of origin. This is important because it might be possible to develop varieties suitable for production in areas having short rainy period like the Sudan and Sahel savanna zones of Nigeria.

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RÉSULTATS DES INVESTIGATIONS PRÉLIMINAIRES DE SAMARU, NIGERIA, CONCERNANT LES CULTIVARS DE TOURNESOL

Résumé

On estime que le tournesol pourrait compléter la production d'huile végétal en Nigeria, ceci étant caractérisé par résistance à la sécheresse et s'adaptant bien aux différents types de sol et climat.

Pendant les trois dernières années une collection a été formée, renfermant 45 cultivars à différentes provenances. Le comportement de ceux-ci en essais est présenté, et on met en évidence les génotypes les plus adaptés aux conditions respectives de milieu. Les plus valeureux seront testés en conditions de production et seront utilisés de préference comme matériel initial dans le programme propre d'amélioration.

La variabilité large de la réaction des génotypes testés suggèrent le fait que les travaux de sélection peuvent aboutir à l'obtention des cultivars spécifiques à cette zone.

Une analyse des valeurs enregistrées pour les principales caractéristiques morpho-physiologiques est entreprise. La plupart des cultivars ont eu une période de végétation plus réduite à Samaru que dans les localités d'origine. Ce fait est positif, puisque la précocité est une propriété importante de la culture du tournesol dans les zones de savane du Nigeria.

RESULTADOS DE LAS INVESTIGACIONES PRELIMINARIOS EN SAMARU, NIGERIA, REFERENTES A LOS CULTIVARES DE GIRASOL

Resúmen

Se aprecia que el girasol podría completar con éxito la producción de aceite vegetal en Nigeria gracias al hecho de que se caracteriza por resistencia a la sequia y se adapta bien a diferentes tipos de suelo y clima.

En los últimos tres años se formó una colección de 45 cultivares de proveniencias distintas. En el presente tabajo se muestra el comportamiento de éstas en cultura comparativa y se evidencian los genotipos mál adaptados a las respectivas condiciones de medio. Los más valiosos de ellos serán testados en condiciónes de producción y también utilizados con preferencia como material inicial en el programa proprio de mejora.

La variabilidad amplia de la reacción de los genotipos testados sugiere el hecho que los trabajos de selección se pueden acabar con la obtención de cultivares específicos para esta zona.

Se analizan los valores registrados para los principales rasgos morfo-fisiológicos. La mayoría de los cultivares tuvo un periódo de vegétación más reducido en Samaru que en las localidades de origén. Este hecho es positivo, puesto que la precocidad es un rasgo importante en la cultura de girasol en las zonas de sabana de Nigeria.