Table 1.—Morphological and yield characters of mutant and control.*

Genotype	Plant height (cm)	Node Nº	Internode length (cm)	Length of Raceme (cm)	Nº pods /plant	Pod length (cm)	Nº seeds /pod	10 seed wt. (g)
Dwarf mutant	20.3	19.9	0.4	1.8	10.8	4.2	6.0	1.3
Control	75.3	14.7	1.8	7.1	20.6	9.5	7.0	2.0

* The observations are based on mean of 10 plants

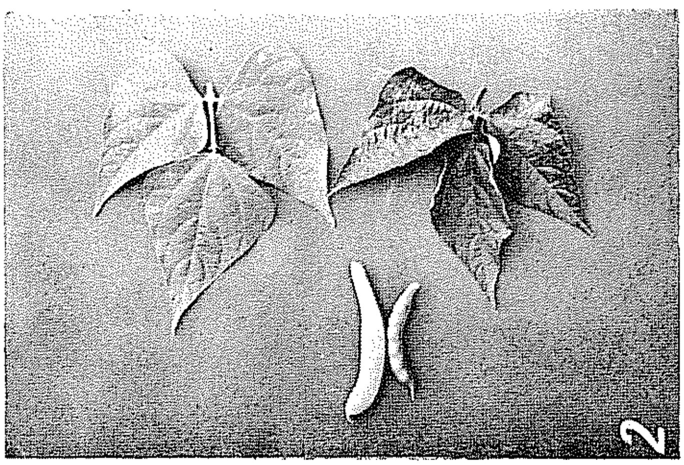

Fig 2.—*Leaf and pod morphology of dwarf mutant (right) and control (left).*

Inheritance of dwarf character. The originally identified dwarf mutant segregated into normal and dwarf types. In the next generation, the normal segregant did not show further segregation, whereas some of the dwarf plants showed further segregation, indicating that dwarf growth habit is dominant over normal type. This is further confirmed from the evidence that, when a commercial variety, with indeterminate growth habit is croseed with dwarf mutant the F_1 plants show dwarf growth habit.

The dwarf mutant, in certain morphological aspects, resembles the compact mutant, reported by Moh and Alan (1) The compact mutant induced by γ-radiation is reported to be controlled by a recessive gene. Apparently, the compact character and the dwarfness are controlled by different genes resulting in similar phenotypes.

The dwarf character can be of great use for improving plant type of commercial varieties with prostrate growth habit, thereby contributing for development of upright plant types with better light interception and suited for mechanical harvesting.

Summary

In the M_2 generation of a black bean variety 'Porrillo Sintético', treated with ethylmenthane sulphonate, a dwarf mutant was identified The mutant exhibits a general reduction in the height and various other parts of the plant. The character is controlled by a dominant gene.

July 19th, 1979.

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Effect of polyethylene glycol induced moisture stress on the germination of some tropical seeds*

Sumario. Se germinaron semillas de ocho especies tropicales de cultivos y de malezas en soluciones acuosas, de 0 a -3,5 bar, de polietileno glicol-6000 para simular una sequía La germinación de todas las especies disminuyó conforme decrecían los potenciales Una tensión de humedad de 1 bar provocó una caída significativa en el porcentaje de germinación de 70-100 a 0 bar hasta 0-10 por ciento

Introduction

Drought is commonly blamed as a cause of germination failure, yet the way in which seeds are killed by drought is far from clear (3). The amount of soil moisture needed for successful seed germination differs considerably among crop species (5) and varieties (11, 13). With the increasing frequency of drought occurrence in the Sahelian region of Nigeria, availability of water at the time of seed germination is critical. There is a need therefore to establish a range of soil moisture tensions for the germination of seeds in this region. In this regard, Slatyer (12) suggests that

* This work was supported by University of Ife Research, grant Nº 14 2538 to Dr. A. C. Adebona.

the nature of the osmotic agent should be taken into account in moisture-stress experiments. For example, it is known that salt solutions are phytotoxic (14) and probably also complicated by interactions in their osmotic and specific ion effects (10) and sugar solutions have been shown to have some disadvantages (15). Polythylene glycol-6000 solutions are chemically inert and non-toxic and have been widely used to simulate drought in seed germination experiments (9, 11, 16).

The objective of these experiments was to determine the germination of seeds of some tropical crop and weed species under simulated drought.

Materials and Methods

Germination tests were conducted in the dark and under light in cooled incubators set up at 25°C with seeds of *Tridax procubens* L., *Synaedrella nodiflora Solanum nigrum* L., *Lycopersicum esculentum* Benth Gaertn. *Ocimum basilicum* L., *Amaranthus hybridus* L., and Hook *Capsicum frutescens* L., and *Nicotania tabacum* L. Weed seeds were harvested locally.

The experimental unit was a Griffin seed germinator holding 50 seeds placed on a layer of Whatman Nº 1 filter paper. The paper was either moistened with distilled water (control) or with different concentrations in weight of polyethylene glycol-6000 (P.E.G.-6000). P.E.G.-6000 (supplied by BDH, Poole UK) was made up as 0, 3, 5, 7, 10, 12 and 15% solutions. These concentrations were converted to atmospheres (hence bars) by extrapolation from the data compiled by Williams and Shakewich (16). The number of seeds that germinated were counted daily for seven days and radicle emergence was the criterion for germination.

The results are expressed as percentage germination after a period of seven days based on four replicate samples of 50 seeds.

Results and Discussion

The germination of *Tridax, Synaedrella, Ocimum, Amaranthus, Solanum, Lycopersicum, Capsicum* and *Nicotania* seeds over a wide range of equivalent osmotic potentials is illustrated in Figures 1 and 2.

In all the 8 species tested, the total germination decreased with decreasing water potentials and the pattern of response was the same. The germination percent fell from a very high value (75-100%) at 0 bar to almost zero (0-10%) at -1 bar in the dark and this difference was significant. In *Amaranthus,* this fall occurred at -1.5 bars.

In those treatments where moisture-stress germination tests were carried out under light, there was slight stimulation of germination at a given stress potential up to -2 bars in *Amaranthus* and -3.5 bars in *Lycopersicum* and *Capsicum* (Fig. 1). The findings here are in agreement with the results of Khan (7) on lettuce; Karsen (4) on *Chenopodium album;* Berrie *et al* (1) on lettuce and Zohar *et al* (17) on *Eucalyptus,* who

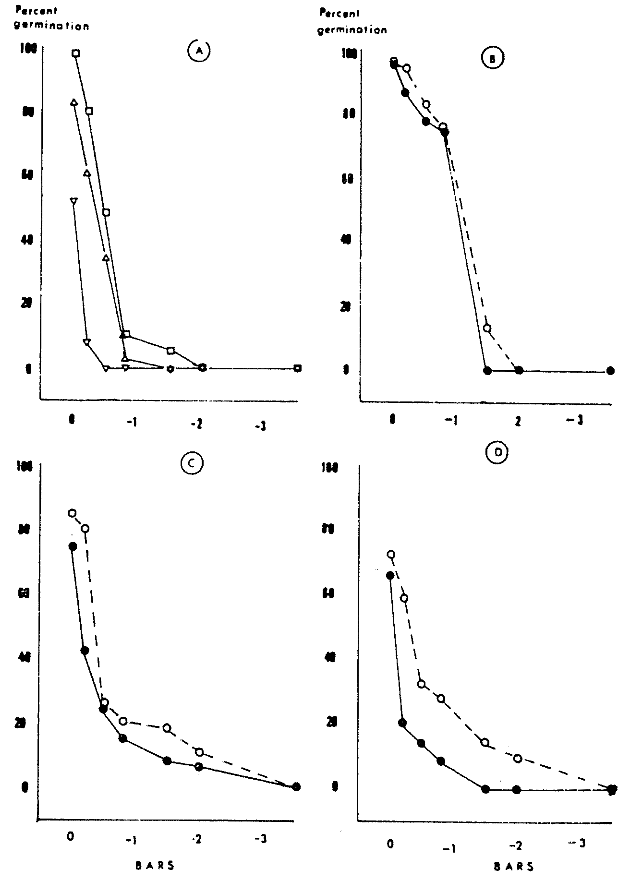

Fig. 1.—*(A) Germination of* Ocimum basilicum (□) Synedrella nodiflora (△) *and* Tridax procubens ▽ *after 7 days exposure to a range of equivalent moisture potential.*
Effect of simulated drought on
(B) Amaranthus hybridicus
(C) Lycopersicum esculentum *and*
(D) Capsicum frutescens
in the light (○) *and in the dark* (●) *after 7 days of germination.*

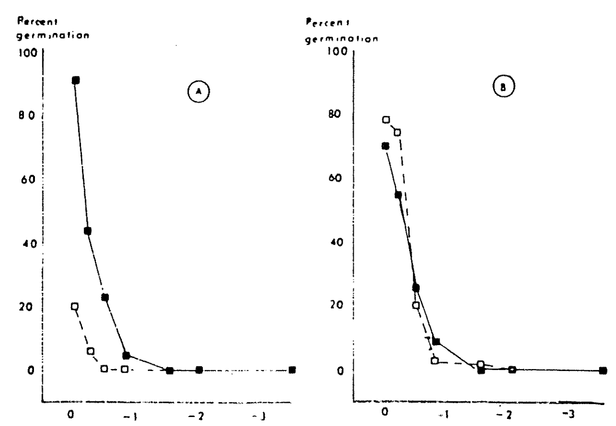

Fig. 2.—*Effect of simulated drought on*
(A) Solanum nigrum
(B) Nicotania tabacum
in the light (□) *and in the dark* (■) *after 7 days of germination.*

reported that light was a decisive factor in improving germination under osmotic stress

From these experiments, it may be concluded that in the natural environment germination of these seeds will occur only when adequate water is available; in this case it would almost certainly be in the free state The results further indicate that water availability is very crucial for the species considered Although germination under osmotic stress cannot be used to predict the behaviour of seeds in dry soil (6) it is a fair indicator of which seeds would germinate under a given moisture level.

Tolerance of low water potentials during germination is an adaptive factor contributing to the growth of weed and crop plants The suggestion that there is a characteristic water potential below which seeds of a given species will not germinate underscores the need for a more comprehensive study of the moisture stress-germination relationships of seeds in the Sahelian tropics

Summary

Seeds of eight tropical crop and weed species were germinated at 0 to -3.5 bar water solutions of polyethylene glycol-6000 to simulate drought. Germination of all species decreased with decreasing potentials A moisture stress of 1 bar led to a significant drop in the percentage germination of 70-100 at 0 bar to about 0-10%.

April 30th 1979.

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Purification and serology of bean common mosaic virus

Sumario La cepa tipo del virus del mosaico común del frijol (BCMV) fue purificada de hojas infectadas de frijol mediante clarificación con cloroformo-tetracloruro de carbono, precipitación con polietilenglicol, y centrifugación en gradientes de cloruro de cesio Un examen de la suspensión final con el microscopio electrónico, demostró la presencia de partículas de 730-740 nm de longitud características de este virus Al ser analizada en el espectrofotómetro, la suspensión del virus purificado mostró una relación 260/280 nm de 1,27 Tres componentes de peso molecular 29.0, 32.5 y 34.4 x 10^3d fueron observados mediante electroforesis del virus en medio de poliacrilamida al 10% con sulfato dodecilo de sodio (SDS) Se produjo un antisuero según la técnica de inmunización en la yema de la pata trasera de un conejo, el cual demostró poseer gran especificidad en pruebas de inmunodifusión doble en medio de agar con SDS

The serological characterization of bean common mosaic virus (BCMV) has often been hindered by the lack of a suitable purification method. The two major problems encountered in the isolation of this virus are, first, its tendency to aggregate and precipitate at low centrifugal forces and, secondly, the incomplete separation of the virus from major plant contaminants (1, 4, 8, 10).

This report describes a purification method that has permitted the isolation of BCMV with a high degree of purity and capsid protein integrity, and the production of a specific antiserum from minimum amounts of purified virus