SOME OBSERVATIONS ON THE AUTECOLOGY OF

THEMEDA QUADRIVALVIS (Linn.) O. Ktze. Var. QUADRIVALVIS

BY S. C. PANDEYA

(Department of Botany, University School of Sciences, Gujarat University, Ahmedabad-9, India)

Received August 3, 1966

(Communicated by Professor T. S. Sadasivan, F.A.SC.)

ABSTRACT

Themeda quadrivalvis var. quadrivalvis has restricted geographical distribution. It, otherwise, dominates in low-lying areas at Sagar, M.P. (where the studies were undertaken). The grass community is kept fenced during the growth period. Underlying soils are stabilised, and moderately moist. The study reveals that the restricted distribution of the species is perhaps due to low migration capacity and low ecological amplitude. Success of the species to form almost pure stands, in its area of distribution, may be due to almost no seedling mortality and formation of simple aggregates. Further, the species yields a good bulk of hay. It has optimum feed value during the month of September.

INTRODUCTION

Themeda quadrivalvis (Linn.) O. Ktze. var. quadrivalvis is the dominant grass on foots of hills and hillocks and low-lying areas at Sagar, M.P. (where the studies were conducted) forming Themeda quadrivalvis association (cf. Pandeya, 1961, 1964a, 1964b). Underlying soils are stabilised and moderately moist. The excellence of the soil on which the species grows is attested by the closeness of the surrounding land utilised for crop production. During the growth period the grassland stands are either fenced with cut thorny bushes or otherwise protected from grazing.

T. quadrivalvis is a tall (1·5 to 3 m.), deep-rooted grass. The plants are annual to perennial. In the T. quadrivalvis association it covers 80 to 95% of the ground. The grasses of the association are maintained for hay and are cut in the month of October, every year. The plants start growth from old root-stocks and seeds in the month of June, after a few heavy showers. The vegetative growth is vigorous. With the close of monsoon, in the month
of September, the plants start flowering. Even if the plants are not cut for hay in the month of October, they naturally completely dry up by the close of the month of November.

*T. quadrivalvis* belongs to the tropical and sub-tropical regions of Old World, chiefly Indo-Malayan (*cf.* Blatter and McCann, 1935). In India it occurs in North-West India, Madhya Pradesh, Western Peninsula, Bihar (Haines, 1924), and Naga Hills (Bor, 1960). Hitchcock (1951) describes it as an introduced grass in U.S.A.; established on bottom land, near Oplousas, St. Landary Parish, La. Also introduced in the West Indies and East Indies. This excellent fodder grass thus has restricted distribution.

The present investigations have been undertaken to understand the causes for the restricted distribution of the species and to work out the optimum feed value of the grass when it may be harvested for hay.

**RESULTS AND THEIR INTERPRETATION**

I. *Seed and its Germination*

(i) *Size, shape and weight.*—The seeds are oblong-lanceolate in shape. Length of the seeds varies from 4.12 mm to 7.88 mm (Mean 6.25 mm; Standard Deviation (S.D.) ± 0.9068). The breadth varies from 0.91 mm to 1.12 mm (Mean 1.014 mm; S.D. ± 0.0831). The weight of a single seed varies from 1.7812 mg to 2.1534 mg (Mean 1.9375 mg S.D. ± 0.1249).

(ii) *Seed output.*—Seeds ripe from down upwards. Average seed output, calculated in 30 stands of the association, is 1,332 per plant (Minimum 624; Maximum 2,000).

(iii) *Germination.*—Seeds were collected in the month of October and put for germination immediately. There was no dormancy. Germination experiments were set in the months of April–May in the subsequent year but before the seeds would otherwise germinate in nature. Following treatments were given to the seeds:

(a) In different light exposures.

(b) Sulphuric acid scarification.

(c) Electric shock of 8 volts for ½ hour.

Germination was effected in petri-dishes in between wet filter-papers. Three replicates were set for each treatment.