CHAPTER TWO
GENERAL MATERIALS AND METHODS
Six grass species were identified as most suitable for the present study, because they are distributed in abundance with comparatively good grain size. They are:

2.1. *Dactyloctenium aegyptium* Beauv. (Plate I, Fig.1)

This is an annual very variable grass with erect or creeping culms, 6-18 inch long rooting and branching proliferously at the nodes. Leaves distichous, acute or acuminate, ciliate, sheaths compressed. Inflorescence of 2-6 digitate spikes. Grain reddish, rugose and sub globose. The grass is common throughout the plains of India and ascends up to 5,000 ft in the hills. It assumes a prostrate habit on poor dry soils and is a weed in open places and cultivated fields. It is one of the most drought resistant grasses because of its rapid growth and seeding in each wet season, even if of short duration. (Skerman and Riveros, 1990)

2.2. *Eleusine indica* (L) Gaertn. (Plate I, Fig.2)

It is commonly called as crow’s foot grass or Indian goose grass. It is a coarse tufted, annual grass which grows to 30 – 60 cm height, with laterally flattened shoots. The inflorescence consists of 1 to 13 narrow finger like spikes, 4 to 15 cm long, arising from the top of the stem to form a spreading umbel. Pericarp persistent, very loose and membranous, enclosing the rugose seed (Gardner, 1952). Its extensive root system allows it to forage for moisture well during its annual growth. Seedlings have exceptional vigour and quickly establish themselves. It reproduces by seeds and old roots (Skerman and Riveros, 1990).
2.3. *Setaria intermedia* Roem and Schult. (Plate II, Fig.3)

This is an annual, culms 20 – 60 cm high, erect or decumbent, rooting at the lower nodes; nodes glabrous. Leaves linear-lanceolate or linear, 5-30 x 0.3 – 1 cm, rounded at base, softly hairy. Sheaths keeled, sparsely tubercle based, hairy ciliate along one margin. Ligules row of hairs. Panicles spiciform, narrow, interrupted, long. Bristles 1-8 mm long, angular, scabrid spike-lets broadly elliptic or ovate or sub globose. Lower floret barren or male, with rudimentary stamens, anthers 0.5mm long. Upper floret bisexual. Stamens 3; anthers 0.5 - 1mm long. Ovary oblong, 0.25 – 0.5mm; styles 0.5 – 1mm; stigmas 0.5 – 1mm long. Fairly common along the banks of streams, shades of trees, bunds of paddy fields, wastelands and road-cuttings of hills and plains (Sreekumar and Nair, 1991).

2.4. *Setaria pumila* (poir) Roem & Schult .(Plate II, Fig.4)

This is an annual, culms 5-120 cm high, creeping decumbent or erect, tufted; nodes glabrous. Leaves lanceolate linear glabrous or sparsely hairy, sheaths keeled. Ligules ovate, membranous, thin. Panicles spiciform, cylindric, 0.5-15cm long, yellowish. Bristles numerous, 1-6 mm long, scabrid. Spikelets ovate or sub globose. Palea elliptic stamens 3, ovary oblong. It is very common in wet lands, bunds of paddy fields, road sides along the margins of forests, in open grasslands, along the banks of streams, backwaters and canals along sea shores and in waste places, as well as a weed in tapioca plots and rubber plantations. It is a polymorphic species, where the length of leaves and panicles show a gradation in variation. This highly variable grass occurs in all sorts of localities in plains and hills of Kerala (Sreekumar and Nair, 1991).
2.5. *Sporobolus indicus* R. Br. (Plate III, Fig.5)

A good pasture grass. Perennial, rarely annual, erect, prostrate or creeping herbs. Leaves flaccid usually flat not pungent, up to 16 inch long, .1 – 2.2 inch wide not stoloniferous; culms up to 3 ft. high; rather robust; panicles often pyramidal spikelets small all alike. Lodicles 2, very minute or 0. stamens 2-3, style -2, free. Grain oblong, oboviod or pyriform, free within the lemma and palea: Pericarp thin, hyaline, loose; embryo large (Gamble, 1928).

2.6. *Echinochloa crus – galli* (L.) Beauv. (Plate III, Fig.6)

This is commonly called as barnyard millet. It is an annual grass with more or less robust culms ascending to 105 cm from a geniculate base; spikelets 3-4 mm, crowded in the racemes, which are often branched; panicle dense and stiffly erect (Henty, 1969). The basal sheaths are commonly purplish, owing to the folding together of the sides of the sheaths (Burbidge, 1968). It often grows in standing water. It is a useful forage plant for all the herbivorous animals and the grain is eaten by human in times of want (Skerman and Riveros, 1990).

2.7. Harvesting of grains for further studies

The mature grains of the plants were harvested from adult spikes. The spikes were collected and thrashed to separate the grains. The grains thus collected was sundried till the seeds attained a constant weight. The grains obtained after this process was properly tinned and shelved for further studies. Close up of the inflorescence and the grains are shown in Plate IV&V.
Fig. 1  
*Dactylolctenium aegyptium*, Beauv.

Fig. 2  
*Eleusine indica*, Gaertn.

PLATE 1
Sporobolus indicus, R. Br.

Echinochloa crus-galli, Beauv.

PLATE III