INTRODUCTION
I. INTRODUCTION

The crop residues continue to remain as staple fodder for ruminant livestock in India. In spite of efforts to improve crop residue utilization, significant amount of crop residues continue to remain poorly utilized resulting in considerable wastage depending on crop and feeding practices. For example, rice straw is burnt in rice cultivation regions to the extent of 80 per cent (MNRE report, 2010). Similarly maize straw (stover) in maize growing areas is burnt to the extent of 30 – 40 per cent (Pathak et al., 2010). Although the remainder is used as fodder, much of it is poorly utilized because of feeding in an un-chaffed form. It is also a practice to leave maize plants standing in the field after harvesting ears, allowing it to be grazed, withered, or burnt. In the process, a significant quantity of fodder is wasted by trampling, pest attack, leaching and decomposition as a consequence of unseasonal rain, or excessive dehydration due to heat and radiation.

The reasons for disposing maize stover as described above are, (i) lack of awareness of its potential feeding value, (ii) unfavourable physical structure (low density, poor packing qualities) imposing difficulty in harvesting, compaction, transporting, handling and feeding to animals and (iii) poor physical characteristics such as texture (dry and coarse) leading to poor palatability, and (iv) low nutrient density.

India, being 7th largest maize producer in the world, and Karnataka contributing nearly 18 per cent (FAO, 2012) to the national maize pool, the quantity of maize stover produced assumes significance in the context of fodder shortage. Wasting of such crop residues is a matter of concern. Although a number of simple methods recommended to improve nutritional value of dried crop residues can as well be adopted for maize stover,
these technologies have not gained acceptance by the farmers in this region. Therefore, there is a need to seek methods alternative to nutritional enrichment of dried crop residues.

Drying of crop residues after grain harvest is the traditional practice in the tropical countries because of the convenience and abundance of resources needed for drying, such as sunlight and heat. However drying may not be the best method from the point of nutrient conservation. For example, incomplete drying as a consequence of unseasonal rain in harvesting season leads to considerable spoilage. A moisture content in stacked straw ranging from 14 to 33 per cent, creates risk of fire outbreak (Shinners et al., 2003). A loss of up to 23 per cent dry matter has been reported in bale and stack storage of maize stover because of plant and microbial respiration (Richey et al., 1982). As an alternative to dry storage, wet storage in the form of silage is being considered (Richard et al., 2001).

The advantage of drying of crop residues for prolonged storage in arid and semiarid tropics is undisputable. But in the wisdom of ruminant livestock farmers, wet crop residues soon after grain harvest are better relished than those that are completely dried. Sharief (1984) reported that the dry matter intake (DMI) of wet rice straw following grain harvest was 28 per cent higher compared to dry rice straw. Krishnamoorthy et al. (2006) and Santos et al. (2010) reported decline in both intake and digestibility of rice straw as a consequence of post-harvest drying. Thus the advantage of post-harvest drying of crop residues for storage is at the cost of compromising with DMI and digestibility, both of which are important to fulfill energy needs of ruminants.
Cereal and millet straw are the major feed resources for ruminants in regions where green fodder availability is limited and seasonal. Since grain harvest in almost all cereal crops are seasonal, availability of straw is also seasonal and in abundance, creating an opportunity to conserve wet straw in the form of silage so that in lean season succulent roughage can be fed to ruminant livestock. Ensiling preserves nutritive components by decreasing pH through homo-fermentation of major soluble carbohydrates to lactate (Sun et al., 2009), unlike in conventional sun drying that may lead to withering and loss of nutrients. NRC (1988) feed composition table reveals a higher energy value in maize stalklage than in maize stover. Therefore, it is hypothesized that maize stover conserved in wet form can have a better feeding value than the dried stover, specially for lactating cows in view of their demand for higher energy to meet the lactation needs.

This study was conducted with the objective of assessing,

(i) The potential of converting maize stover into silage,

(ii) The impact of drying stover on chemical composition and dry matter intake,

(iii) The effect of feeding stover silage against dried maize stover on dry mater intake, nutrient digestibility, milk production and milk composition, and if found beneficial,

(iv) Demonstrate ensiling of maize stover and its feeding value to lactating cows and buffaloes through farmer-participatory approach.