***Sorghum bicolor* L.**

Sorghum (Sorghum bicolor (L.) Moench) is belong to the family of Poaceae (Gramineae) a cereal and forage crop that is indigenous to Africa and has been grown in India for centuries. It is the fifth most important cereal crop in the world and is also valued for its use as fodder and stover. Sorghum fodder is suitable for silage and hay making and In India sorghum is cultivated mainly in Maharashtra, Andhra Pradesh, Karnataka, Madhya Pradesh, Gujarat, Tamil Nadu, Rajasthan and Uttar Pradesh are the important sorghum growing states. In Punjab, Sorghum is an important fodder crop during kharif season. In India to fulfill over two thirds of the fodder demand during Kharif season. Forage sorghum plants can grow up to 6 to 12 feet tall and produce more dry matter tonnage than grain sorghum. Sorghum is a fast-growing, warm weather annual that can provide plenty of feed in midsummer during lean periods. It is best suited to warm, fertile soils and can tolerate drought relatively well, though adequate fertility and soil moisture maximize sorghum yields. The plant becomes dormant in the absence of adequate water, but growth resumes when moisture conditions improve. Sorghum plants contain an alkaloid that can release hydrocyanic, or prussic acid, which is toxic to livestock. However, when the crop is cut and field-cured or ensiled, the hydrocyanic acid degrades, greatly reducing the toxicity. During periods of drought or other stresses, sorghum tends to accumulate nitrates, which can also be toxic to livestock. Therefore, forage should be analyzed for excessive nitrates before feeding. Forage sorghum plants produce buds that can develop into branches or grain-producing tillers, depending on where they form. The culms or stalks of forage sorghums are juicy, and the sweetness of the juice within the stalk varies between varieties. Sweet forage sorghum is preferred by livestock and is likely to be consumed more if used as green chop, hay or bundle feed. The moisture content of the stalk also varies between varieties, which affects the optimum time for silage. Under drought conditions, sorghum leaves tend to fold or curl, rather than roll. This is because rolling of leaves is a response to prevent water loss, but in severe drought conditions, there may not be enough water in the soil to support the plant, so the leaves fold instead. Sorghum leaves also have a heavy white wax, called a bloom

that covers the leaf blades and sheaths. This wax layer helps to protect the plant against water loss under hot and dry conditions.

The wax layer reduces transpiration from the leaves and helps the plant conserve water during periods of drought.

Popular Cultivars:

Fodder cultivars: Buhooth 70, Kafir, Geza 113, Mabrouk, and Lilo.

Cereal cultivars: Inkath, Rabeh, Warkaa and Ishtar.

Suitable environment for growing Sorghum:

Sorghum is a summer crop because it needs a completely frost-free atmosphere because freezing stops growth. The longer the growing season and the higher the temperature, the greater the chances of getting more harvests. Sorghum tolerates drought to a great extent, and the availability of regular irrigation helps increase fodder production. Among the factors that help sorghum tolerate drought are the density of its roots, which have the ability to absorb water, the small area of the leaves, as well as the presence of a waxy layer covering parts of the leaf and stem, which reduces the process of transpiration. Although sorghum tolerates drought, its water requirement is not much less than that of yellow corn, which is less tolerant of drought than sorghum. Sorghum grows in all types of soil, but it is more successful in mixed and heavy soils with good drainage. Sorghum is also more tolerant of salinity than Sudanese grass.

It is necessary to take into consideration the mowing of the crop when it reaches the stage of maturity or the flowering stage because young plants contain hydrocyanic acid. Sorghum gives three to four mowings during the growing season and in some varieties it reaches five mowings. The average green fodder for these mowings ranges from 30 to 40 tons. This depends on the planting date, the amount of seeds used for planting, the fertility of the soil and the variety. Note that the first mowing is taken at the flowering stage. When mowing, care must be taken to leave part of the stem in the ground at a height of 20 cm to renew growth. After 50 days from the first mowing, the second mowing is taken. The mowing date affects the chemical composition of sorghum. Sorghum also retains its nutritional value almost in different mowings due to its ability to branch and form new branches. Nitrogen fertilizers

must also be added, taking care not to exaggerate in adding nitrogen fertilizer so as not to lead to an increase in nitrates. And increase hydrocyanic acid.

Prussic acid:

Plants belonging to the genus Sorghum and many other fodder plants contain alkaloids that, when hydrolyzed, produce a toxic substance called prussic acid (hydrocyanic acid), which, when absorbed in the animal's body in sufficient quantities, leads to the death of the animal as a result of its effect on the hemoglobin in the red blood cells, causing them to break down. Due to the importance of this acid in these feeds, we will discuss it in detail in terms of:

First: The formation of the acid and its relationship to plant growth. The concentration of the acid is higher in young plants, in the leaves, and in the new branches, and it gradually decreases with increasing age of the plant.

Second: The difference in the concentration of the acid in the species and varieties: The concentration of the acid differs between the varieties of sorghum. The concentration of the acid in the fodder varieties is lower than its concentration in the grain varieties, and the animal's palatability of the feed is inversely proportional to the percentage of this acid.

Third: The effect of climatic conditions on acid concentration The acid percentage in sorghum is affected by growth conditions. The nitrogen percentage helps to raise the acid percentage, and thirsting the sorghum plant leads to an increase in acid concentration. Preserving the feed in the form of silage reduces the toxicity of the acid. Fourth: The lethal dose of prussic acid The smallest lethal dose of prussic acid for cows is estimated at 2.04 mg per kilogram of live animal weight and at 2.36 mg per live animal weight for sheep, which are more tolerant of the acid. Avoid acid poisoning Acid poisoning can be avoided by taking the following precautions: Reducing feeding on large plants Delaying grazing or cutting plants whose soil has been exposed to drought for a long time and allowing the feed to wither after cutting Providing a feed of grains and straw before feeding on green fodder and not allowing animals to eat a large amount of green fodder in one meal.