

Intercropping has benefits

The increasing demand for good quality forages by the dairy industry, and the declining water resources, are threatening the sustainability of highly productive irrigated agriculture in the southern High Plains.

Corn and alfalfa are the predominant forages in the region. However, the declining water resources cannot support their production for long. Lower water needs of forage sorghum, compared to corn, makes it a better alternative for the region. But, quality concerns are limiting adoption of forage sorghum.

Typically, sorghum is grown at row spacing wider than 30 inches, in which inter-row space is not occupied by the crop for the major part of vegetative growth. Research has also indicated that biomass productivity increases with the mixing of diverse species.

Intercropping is a system of growing two diverse species of crops on a piece of land at the same time with the assumption that they use both above-ground and below-ground resources more efficiently compared to growing them separately. As a result, often the total productivity of an intercropping system is more than growing any of the component crops alone.

Since mechanical harvesting of intercropping systems for grain production is not possible, it is mostly used in

developing countries. However, in a forage production system, both crops can be harvested together. Thus, an opportunity exists in improving forage productivity in the region with appropriate intercropping systems.

Selection of a crop for the intercropping system depends on the goals for developing the system. For the forage production system in the region, crops that improve biomass production, resource use efficiency and forage quality, and fit well in the rotation system are suitable.

Legumes are a group of crops that is rich in proteins, has wide adaptability, and possesses the unique ability to fix atmospheric nitrogen. They have been recognized for their role in supplying nitrogen to the ecosystem. Recently, they have been credited for improving phosphorus solubility. The growth habits of legumes range from freestanding small shrubs to climbing vines.

If legume forage is used as an intercrop with sorghum, the system may

provide all benefits listed above, plus nitrogen fixation. However, they are underutilized in the southern High Plains. Therefore, we need to identify legumes that are well adapted to the region and fit well in an intercropping system.

Competition in intercropping can be for sunlight, nutrients and water. An intercrop that can tolerate lower light intensity during the later growth period will be of great benefit. A legume intercrop that climbs on the main sorghum crop to receive its share of radiation may also fit well. Root system plays a major role in nutrients and water extraction from soil. With tap root system, legumes differ significantly from the lateral root system of sorghum. In addition, the sorghum root system will take a long time to grow into the inter-row area. Thus, legumes may help in using the limited resources like water and nutrients more efficiently.

These novel studies are being conducted to sustain the supply of quality forage, and at the same time reduce the water used for it.

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