As demand and incentives for biofuels increase, there is some concern that increased biofuel production could lead to decreased food production. One idea is to focus on marginal lands for biofuel production and keep highly productive lands for growing food. However, marginal fields may not be capable of growing enough of a biomass crop to be profitable. Therefore, researchers are investigating perennial crops that are highly resilient and can grow well on marginal land.

Napiergrass (*Pennisetum purpureum* Schumach), a warm-season grass native to Africa, is one perennial crop of interest. Hari Singh, a researcher at Fort Valley State University, and colleagues at the University of Kentucky and U.S. Forest Service recently conducted an experiment to see if napiergrass could be harvested for both biofuel and animal fodder. The potential to grow a perennial crop, on marginal land, for two purposes could have greater appeal than alternative biofuel or fodder options for farmers in the southeastern United States and similar climates. Results of the study were published in *Agronomy Journal* (https://doi.org/10.2134/agronj2018.09.0601).

The experiment was conducted in Fort Valley, GA, which is south of Atlanta. Napiergrass was planted in 2008, and samples were taken in 2009 through 2011. In 2009, napiergrass was harvested in October and November to assess regrowth potential with a late harvest. In 2010 and 2011, there were three harvest treatments—October and November, July and November, and a single harvest in November. These differences in the frequency and timing of harvest were used to compare both yield for biomass production and to test for any impact on nutritive value of napiergrass as fodder.

The authors concluded that the harvest treatments did not influence yield although years were significantly different due to annual variation. Over the three-year study, the average annual biomass across all treatments was 37.2 Mg dry matter ha$^{-1}$. Compared with other biofuel crops, like switchgrass, the annual yields for napiergrass are greater, making this an appealing crop for biofuel use. Additionally, the observed regrowth after harvest suggests that napiergrass...
can be harvested twice a year, in this case July and November, without a decrease in annual production. For biofuel plants operating year-round, the option to harvest twice a year reduces the need for storage capacity.

The study also establishes that napiergrass can provide good quality animal fodder. Six weeks of fresh regrowth following an October harvest resulted in high crude protein and ash and less neutral detergent fiber (NDF) and acid detergent fiber (ADF). However, harvesting napiergrass, which had grown for longer periods of time, resulted in a product that did not meet nutritional standards for use as animal fodder.

If demand for biofuel increases, having crops like napiergrass, which can be grown on marginal land, will reduce the potential for farmers to grow biofuel crops in place of food or commodity crops. Note that while they did not find a negative effect of harvesting biomass twice a year, they only have data for three years. Harvesting multiple times per year, with one of those harvests occurring in the fall, could have a detrimental effect on yields if the crop has a net loss of root biomass. Additional work would be necessary to determine how energy stores are partitioned between above- and belowground biomass throughout the year. But at this time, napiergrass shows great promise as a dual-use perennial crop in the southeastern U.S. and similar climates.

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View the Agronomy Journal article, “Napiergrass Has Dual Use as Biofuel Feedstock and Animal Fodder” at: https://doi.org/10.2134/agronj2018.09.0601.