

A background of Kikuyugrass (*Pennisetum clandestinum*) and its future improvement

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Kikuyugrass is a warm season grass that originates from the Kenyan highlands. It is named after the Kikuyu tribesmen who live in the area from which it originates. In Kenya, Kikuyugrass is generally found on the edges of forests but can also quickly spread into cleared areas. It was taken from Kenya and established in South Africa and Australia in the late 1800's. In Australia it has been used as a forage grass for many years. Kikuyugrass is now found in many other mild climates such as New Zealand, Mexico, Spain, Central America, South America as well as portions of the United States. It was introduced originally into California in the 1920's to lower the amount of soil erosion on hillsides.

From its original roles as a forage grass and erosion controller, Kikuyugrass began to invade other areas, most notably of which is turf. Kikuyugrass' aggressive growing habits aid it in taking over other turf-grasses. Due to this aggressiveness, when it takes over a turf area it is simply managed thereafter as the main turf species.

Kikuyugrass is a C4 grass, but is able to photosynthesize at colder temperatures than other C4 grasses. This translates into longer growth and greener color going into winter. This is one of the benefits to Kikuyugrass when compared to other similar grasses. Active growth takes place between 60 and 90 F, but it can survive in temperatures above 100 F. One of the reasons why Kikuyugrass does well in California and has the potential to replace other less drought tolerant C3 cool season grasses is its ability to survive in relatively colder climates. Kikuyugrass can continue to grow and retain its color in temperatures below 60 F. Kikuyugrass both does and does not enter dormancy in California depending on how cold the winters are and its proximity to the ocean which moderates temperature. Usually it retains its winter color best of all of the warm season grasses. It has even been –recorded to tolerate light frost without loss of color.

Kikuyugrass is spread by rhizomes, stolons, and seed. The seed have a rounded shape and are dark brown in color. They are roughly 1/8" long. Kikuyugrass has a coarse to medium texture and is often compared or confused with Japanese lawngress (*Zoysia japonica*) and St. Augustinegrass (*Stenotaphrum secundatum*). The leaf color is a medium to lime green, while the leaves are flat and pointy, growing from 1-10 inches long. Another distinguishing characteristic of the species is the male flower (white anther and filament) that can be seen above the surface on low cut grass. When seen over larger areas, the filaments give the grass a silver look. When mowed the filaments will usually come back in one day. This silver look can generally be seen in the spring and fall.

Kikuyugrass has a thick mat and has issues with thatching. The thatching can cause spongy turf and uneven surfaces. Scalping and lower quality can also occur. One method to counteract this and other undesirable traits in Kikuyugrass is to mow it at heights below 5/8". Due to its aggressive nature, Kikuyugrass will grow up fences and poles if not checked by mowing. Edging and hand picking are often needed to prevent it from invading other areas. The mat layer and aggressive growth of Kikuyugrass allow it to have a high traffic tolerance as well as recover quickly from injuries such as divots on a golf course. The species requires only 2-3 lbs. of nitrogen per 1000 square feet per year. Sometimes the nitrogen in the water is enough to sustain growth.

Future research

-One aspect of Kikuyugrass research that is in the beginning stages is to measure the size of its genome. This will provide necessary background information to help us understand how Kikuyugrass can best be improved in the future.

-Early research will also concentrate on measuring the genetic variation of samples of Kikuyugrass from all over the world. Studying genetic variation will help to isolate traits that are desirable for breeding such as disease resistance and color retention. This is necessary before breeding efforts can begin.

-Androgenesis, or reduction in ploidy level, will be attempted to hopefully produce a less vigorous growth habit while retaining desirable qualities.

-Long term goals are to eventually breed Kikuyugrass for improved turf quality, disease resistance, and color retention as well as other industry needs like stronger sod strength.