

## Kikuyugrass Primer

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- Scientific Name:** *Pennisetum clandestinum* Hochst. ex Chiov.
- Origin:** East central Africa, subtropical climate with moderate temperatures, 40-60 inches of annual rainfall; named after the Kikuyu Tribe in Kenya
- Distribution:** Africa, Australia, New Zealand, Mediterranean Europe, Central and South America, Mexico, California (introduced in southern California in 1918 for erosion control), Hawaii, Arizona, Texas
- Biology:** Perennial; warm-season (C4); reproduces by rhizomes, stolons, seed; highest rate of photosynthesis between 77 and 104 F; active growth and color retention  $\leq 60$  F (more so than other C4 grasses); mowing can reduce lateral spread and lessen, but not prevent, invasion; fully fertile or male sterile strains; generally does not flower unless mowed; flowers in spring (best) and fall, favored by cloudy, overcast conditions; female organs appear first (1-3 d) on same flower which encourages outcrossing favoring genetic diversity; seed takes 4-5 weeks to develop; 25-27,000 seed/yd<sup>2</sup> to depth of 1.2 inches.
- Breeding and Genetics:** Tetraploid (2n=36); hybridization not practicable with other *Pennisetum* species as kikuyugrass is the only low-growing species; polyploidy is useful in transfer of dominant genes from elite germplasm; clonal propagation is primary means of spread on California golf courses; more potential for outcrossing in open areas; high degree of phenotypic plasticity (i.e., ability to change appearance in response to environment) coupled with fact that common types often outperform cultivars have held back breeding efforts; 'Whittet' high seeding tendency; 'AZ-1' improved selection from 'Whittet' has increased density and less vigor; DNA analyses show genetic diversity among Australian populations
- Establishment:** Seeding rate (0.5-2 lbs/1000 ft<sup>2</sup>); germination in 6-10 days at >65F soil temperatures

<b>Mowing:</b>	0.25->2 inches; heavier, reel mowers, higher frequency desirable; start lower, end higher during growing season
<b>Fertility:</b>	Lower N requirements; 2-3 lbs N/1000 ft <sup>2</sup> /yr on trafficked turf, 1 lb N April, June, August or 2 lb N late spring and 1/8-1/4 lb N/month thereafter; less N (0.5 lb) on lower trafficked areas; supply other nutrients according to sufficiency levels
<b>Irrigation:</b>	Drought tolerance of a C4 grass, but higher water use? Prefers uniform moist conditions
<b>Cultivation:</b>	Aggressive verticutting 3 times/yr (April, July, September) or less aggressively monthly (April-September); no advantage to aggressive verticutting >3 time/yr; Aeration/topdressing 1-3 times/yr including deep-tining
<b>PGRs:</b>	Primo Maxx (trinexapac-ethyl) essential for optimal playing conditions (0.2-0.5 oz/1000 ft <sup>2</sup> /2 wks April-September)
<b>Diseases:</b>	Gray Leaf Spot ( <i>Pyricularia grisea</i> ) – CA 2003; Kikuyugrass Decline ( <i>Gaeumannomyces graminis var. graminis</i> ) – CA 1999, MnSO <sub>4</sub> disease suppression; Rhizoctonia Large Patch ( <i>Rhizoctonia solani</i> ); Kikuyu Yellow ( <i>Verrucalvus flavofaciens</i> ) – Australia
<b>Weed Control:</b>	Sensitive to most herbicides; reduced rates of 2,4-D + mecoprop + dicamba or clopyralid (Lontrel) for broadleaf control; sensitive to sulfonylureas (e.g., Revolver)
<b>Eradication:</b>	Very sensitive to triclopyr (Turflon Ester), MSMA, quinclorac (Drive), fenoxaprop (Acclaim Extra); tank-mixes and repeat applications provide best control; two applications of glyphosate (Roundup Pro) + siduron (Tupersan) + tall fescue>perennial ryegrass provided best conversion
<b>Past Research:</b>	SCGA and NCGA funded UCR in 1990s (\$120,000)
<b>Current Research:</b>	University of Western Australia (fertility, water use, cultivation practices); University of Sydney Plant Breeding Institute and Pennggrass Research (breeding and genetics program)

<b>Advantages</b>	<b>Disadvantages</b>
Traffic tolerance	Medium-coarse texture
Recovery	Thatch
Stress tolerance (heat, drought, salt)	Lighter green color
Winter color retention	Flowering
Active growth, color under cooler temps	Scalping
Low N requirement	Frequent mowing required
	Sensitivity to herbicides
	Invasiveness

### **Research Needs**

- ✓ Breeding and Genetics improvement program in California
- ✓ Answer to developing a “stay-green” C4 grass lies within kikuyugrass?
- ✓ Physiological/management factors affecting growth habit (potential for scalping)
- ✓ Use of other growth regulators for growth/seedhead suppression?
- ✓ Chemical tolerance/safening strategies