Kikuyugrass Primer

Jim Baird
University of California, Riverside

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 ≤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^2 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^2); germination in 6-10 days at >65F soil temperatures

Mowing:	0.25->2 inches; heavier, reel mowers, higher frequency desirable; start lower, end higher during growing season
Fertility:	Lower N requirements; 2-3 lbs N/1000 ft^2/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
Irrigation:	Drought tolerance of a C4 grass, but higher water use? Prefers uniform moist conditions
Cultivation:	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
PGRs:	Primo Maxx (trinexapac-ethyl) essential for optimal playing conditions (0.2-0.5 oz/1000 ft^2/2 wks April-September)
Diseases:	Gray Leaf Spot (*Pyricularia grisea*) – CA 2003; Kikuyugrass Decline (*Gaeumannomyces graminis var. graminis*) – CA 1999, $MnSO_4$ disease suppression; Rhizoctonia Large Patch (*Rhizoctonia solani*); Kikuyu Yellows (*Verrucalvus flavofaciens*) – Australia
Weed Control:	Sensitive to most herbicides; reduced rates of 2,4-D + mecoprop + dicamba or clopyralid (Lontrel) for broadleaf control; sensitive to sulfonylureas (e.g., Revolver)
Eradication:	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
Past Research:	SCGA and NCGA funded UCR in 1990s ($120,000)
Current Research:	University of Western Australia (fertility, water use, cultivation practices); University of Sydney Plant Breeding Institute and Penngrass Research (breeding and genetics program)

Advantages	Disadvantages
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