



PRINCETON 105

KENTUCKY BLUEGRASS

Princeton 105 is an improved moderately dark green variety classified as a “Compact” type of improved Kentucky bluegrass. It exhibits the best traffic tolerance among commercially available Kentucky bluegrass varieties in our industry. It is a cold hardy, persistent, attractive grass that through the development of an extensive rhizome system forms a well-knit, durable sod.

PERFORMANCE CHARACTERISTICS

- “Compact” type
- Highly aggressive, rapid recovery from wear
- High resistance to summer path, stripe smut and resistance to leaf spot, dollar spot and fusarium blight.
- Tolerates very low height of cut
- Deep green color with medium blade width
- Adaptable to a wide range of soils and climatic conditions
- Excellent choice for mixes
- Used by sod producers, sports turf managers, landscaping professionals, and golf course superintendents

Competitive “Compact” type varieties

Diva	Alpine
Moonlight	Indigo
SR 2109	Conni
Blackstone	Glade
Blacksburg	Ram I
Wildwood	Apex



Seeding Rate:

2-3 lbs/1000 sq. ft. on new seeding
 1-2 lbs/1000 sq. ft. on established turf

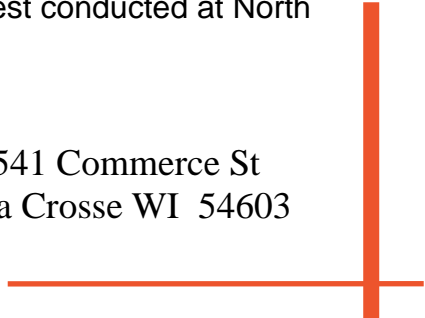
Why Princeton 105 is equal to or better than the competition:

Princeton 105 ranked 3rd in mean turf quality in the 2000 NTEP Kentucky Bluegrass test conducted across 32 US and Canadian locations respectively. Most importantly it ranked 1st among commercially available varieties in the stimulated traffic stress test conducted at North Brunswick NJ test location at Rutgers University.



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



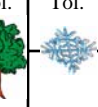



DESCRIPTION

Princeton 105 is an improved moderately dark green variety classified as a “Compact” type of improved Kentucky bluegrass. It exhibits the best traffic tolerance among commercially available Kentucky bluegrass varieties in our industry. It is a cold hardy, persistent, attractive grass that through the development of an extensive rhizome system forms a well-knit, durable sod. Princeton 105 is adapted to a wide range of soils and climatic conditions.

APPLICATION

Princeton 105 is an excellent choice for use in elite Kentucky bluegrass blends for sod producers, sports turf managers, landscaping professionals, golf course fairways, tees and roughs. It is also highly recommended for seed mixtures that contain improved perennial ryegrass, chewings fescue, hard fescue, sheeps fescue, strong creeping red fescue and tall fescue.

Turf Maintenance Characteristics

Growth Habit	Estab. Rate days	LHC Tol. 1/2"	Mowing Freq.	Traffic Tol.	Thatch Prod.	Comp. Mix	N. Reg.	Shade Tol.	Cold Tol.	Drought Tol.	ET rate mm/day	Endo-phyte	Salinity Tol. mmhos
 Rhizome	Slow 21-28	Good	 1x Week	 Excellent	Med-High	Fair-Good	 Med 5-6 lbs*	 Poor	 Very Good	 Good	 Med 7-8	No	 <3 Poor

LHC=low height of cut, ET=evapotranspiration, N=nitrogen *per 1,000 sq. ft; rates may increase or decrease based on location, soil type, irrigation practices, desired turf quality, humidity & other abiotic and biotic factors.

PERFORMANCE

Princeton 105 ranked 3rd in mean turf quality in the 2000 NTEP Kentucky Bluegrass test conducted across 32 US and Canadian locations respectively. Most importantly it ranked 1st among commercially available varieties in the stimulated traffic stress test conducted at North Brunswick NJ test location at Rutgers University. It also exhibited the least amount of annual bluegrass weed invasion 8.3% vs. the highest invasion per plot of 85%. Princeton 105 exhibits high resistance to summer path, stripe smut and resistance to leaf spot, dollar spot and fusarium blight.

KENTUCKY BLUEGRASS TYPES

Kentucky bluegrass is an apomictic species that exhibits a great range of genetic diversity. Kentucky bluegrasses reproduce asexually; in scientific terms by a method called *apomixes*. Seed from a mother plant (children) is essentially identical to the parent plant. Therefore, enhanced genetic diversity in Kentucky bluegrass seed for the end user is critical. Blends and mixtures containing genetically different Kentucky bluegrass varieties reduce the opportunity for an individual strength or weakness of a Kentucky bluegrass cultivar to express itself over time. Therefore, single varieties of Kentucky bluegrass may not provide enough genetic elasticity against abiotic and biotic stresses during the growing season. Many distinct types of Kentucky bluegrass have been released which have been conveniently classified into 14 groups based on growth and performance characteristics (Murphy, et al 1998). Princeton 105 is classified as a “Compact” type Kentucky bluegrass that is used extensively by sod producers, sport field manager, landscape professionals and quality conscious homeowners.

Types of Kentucky bluegrass include:

- **BVMG types** exhibit good seeding vigor, they have moderate winter color, leaf spot resistance, but are moderately susceptible to billbug.
- **Aggressive types** have high shoot density.
- **Compact types** with low, compact growth habit, good leaf spot resistance but poor spring green-up.
- **Midnight types** are compact type KBG characterized by long winter dormancy, late spring green-up, very dark high quality turf, good heat tolerance but are susceptible to powdery mildew.
- **Bellevue types** have medium to low growth and early spring green-up
- **CELA types** exhibit early spring green-up, but tend to have less seed head formation under mowed turf conditions than the Bellevue types
- **Cheri types** have medium to wide leaves.
- **Common types** have early spring green-up, narrow leaf blade but are susceptible to leaf spot.
- **America types** are compact types but have finer leaf blades than Midnight type KB's and exhibit good resistance to dollar spot, leaf spot and stripe smut.
- **Julia types** exhibit early spring green-up, good leaf spot resistance and strong wear tolerance.
- **Mid-Atlantic types** have vigorous extensive rhizome system and improved heat tolerance.
- **Shamrock types** are similar to BVMG types, their only difference being Shamrock types exhibit good tolerance to stripe smut.
- **Wabash types** are medium dark green, excellent heat tolerance and good recovery from disease.
- **Other types** are varieties that have not yet been defined to the previous 13 classifications.

Blends and mixtures containing Kentucky bluegrass should include complimentary and compatible but different varieties for optimal long term turf performance. For example a blend of “Midnight” type (Alexa), “America” type (Apollo), “BVMG” type (Dragon) and “Compact” type (Princeton 105) will provide broad genetic elasticity for improved disease resistance and agronomic performance.



SEEDING

Dates: Spring and fall when soil temperatures are above 60°F. Kentucky bluegrass is generally slow to tiller once germinated so higher soil temperatures with increasing photoperiod in spring or warm soils with decreasing photoperiod in the fall provide an optimal soil seed interface for optimal seedling establishment.

Rates: 2-3 lb/1000 sq.ft. on new seedings. 1-2 lb/1000 sq.ft. on established turf. Princeton 105 has a high seed count of 1,900,000 seeds per pound dependent on the year of harvest, location of production and seed production practices.

Depth: Sow at 1/4 to 1/2 inch. Kentucky bluegrass is slower in germination than other cool-season grasses and full germination of turf may not be seen in 21-28 days under normal conditions.

CULTURAL PRACTICES

Soil Preparation: Prepare a firm seed bed free of clods, sticks, and vegetative debris. Seed should be in contact with soil. Kentucky bluegrass is intolerant of heavy soil (high bulk density) and saline soil conditions and is best established in well drained sandy or silt loam soils.

pH: Soil is best maintained at a neutral pH of 7.0. Of the cool-season turfgrasses Kentucky bluegrass is the most susceptible to variation in soil pH conditions. Kentucky bluegrass does not do well under low or acidic soil conditions.

NPK requirement: Princeton 105 would be described as a medium user of fertilizer. In northern regions 5-6 lb N/year; southern and transitional climates 6-7 lb N/year with minimal utilization in summer months to discourage foliar diseases such as brown patch and pythium. NPK ratios are generally recognized as 5-1-3 with clippings retained on the turf.

Water Use: Kentucky bluegrass has a moderately short fibrous root mass for water uptake and will go into stress induced dormancy or may die under severe drought conditions. An ET rate of 7-8 mm per day places Kentucky bluegrass into medium water use category for cool-season turfgrass. ET rates can be reduced by frequent mowing to encourage a denser turf and infrequent but heavy irrigation to stimulate deep subsoil root growth.

Thatch management: Kentucky bluegrass is recognized as a medium to high thatch producing cool-season turfgrass. High N levels to encourage fast grow-in coupled with minimal traffic pressures encourage thatch accumulation. Verticutting, lower mowing heights and dethatching are recommended for dormant sod or grass breaking dormancy in the spring. At any given dethatching never remove more than 1/2 inch of thatch. If the thatch layer is greater than 1 inch it is recommended that removal be done over a period of years.

Mowing height: Princeton 105 should be mowed at 3/4—2 in. and may tolerated 1/2 in. mowing height under optimal growing conditions.

Weed Control: From No. Carolina State University (NCSU) Pest Control Recommendations for Turfgrass Managers 2003. In established turf for post-emergent broadleaf control 2,4-D, MCPA, *clopyralid + triclopyr* (Confront) and *dicamba* (Banvel). Spring pre-emergent control DCPA or bensulide (Dacthal). Pre-emergent crabgrass and goosegrass control on established Kentucky bluegrass with *pendimethalin* (Pre-M) *prodimone* (Barricade), *oxadiazon+benefin*, *oryzalin* (Surflan), *benefin* (Balan), siduron (Tupersan), *dithiopyr* (Dimension).

*All reference to pesticides, herbicides and fungicides whether a generic or named product is for general informational purposes only. Text reference is not intended as an endorsement nor does omission imply criticism. Always read and follow labeled instructions.



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