Whittet

Kikuyu

Pennisetum clandestinum

INTERNATIONAL

KEY FEATURES

- Long term perennial grass
- Lacks growth in cold conditions or frost
- Actively growing in early Spring to late Autumn period
- Capable of high-quality forage if managed correctly
- Highly persistent
- Survives long dry periods
- Responds well to nitrogen fertiliser in warm season
- Tolerant of heavy grazing
- Better frost tolerance than some warm season grasses
- Very effective for erosion control
- Very competitive; suppresses weeds
- Can be oversown with hard seeded annual pasture legumes to bolster winter production

Whittet Kikuyu is a perennial grass. Most growth in spring, summer and autumn. Prostrate growth. Suited to very fertile, well-drained soils. In favourable conditions the runners spread rapidly, making kikuyu a very suitable species for erosion control. Responds very well to nitrogen fertiliser and irrigation combined with intensive grazing (e.g., strip grazing).

Pastures dominated by kikuyu are unsuitable for horses.

Ryegrass or oats are often direct drilled into established kikuyu to provide a year-round feed supply. White clover or Kenya clover (far North Coast only) are the main companion legumes used, with lotus also used on suitable soil types. Do not use in mixtures of grasses. Sow or plant in spring to early summer or late summer to early autumn, depending on the district.

Growing Conditions

Soil Type:

Widely adapted but prefers fertile, moderately drained, light to medium textured soils and fertilised moist sandy soils. It can tolerate some waterlogging and up to 10 days inundation, as well as moderate salinity levels.

Sowing Rate:

Pure 1-3kg/ha

Rainfall:

600mm+

pH:

5.5 – 7.0 ($CaCl^2$)

tolerates pH as low as 4.5

Kikuyu agronomic information

Scientific name(s) *Pennisetum clandestinum*

Strengths

- High quality forage if managed correctly
- Long growing season
- Highly persistent
- Survives long dry periods
- Responds well to nitrogen fertiliser in warm season
- Tolerant of heavy grazing
- Better frost tolerance than some warm season grasses
- Very effective for erosion control
- Rapid summer growth rate with high yield potential
- Very competitive; suppresses weeds

Limitations

- Requires good management to maintain feed quality
- Becomes rank and unpalatable if ungrazed
- Requires high fertility for sustained production
- Tops killed by heavy frost
- Poor winter growth
- Difficult to maintain a legume in pasture
- May become a weed of cultivation

Plant description

Plant: A mat-forming perennial grass which spreads by underground stems (rhizomes) and profusely branched, creeping surface stems that root down at the nodes (stolons). Under regular grazing or cutting it forms a dense turf, but otherwise can grow to about 30 or 40 cm deep. It has a deep root system (to >3 m).

Stems: Rhizomes and stolons about 2 - 4 mm diameter.

Leaves: Borne on short stems rising from the stolons. Leaves on the seed-bearing (fertile) shoots are shorter than those on the purely vegetative (sterile) shoots. Leaf blades are folded when young, and flatten out, growing to about 30 cm long and 7 mm wide when mature. They mostly have only a few hairs, while the leaf sheath is densely hairy.

Seedhead: Much reduced and largely enclosed by the leaf sheath at the top of the fertile shoot. Their presence is only indicated when the pollen-bearing stamens or feathery, pollen-receiving stigmata are extended beyond the shoot tip.

Seeds: The kikuyu grain (caryopsis) is dark brown, ovoid in shape, about 2.5 mm long and 1.5 mm broad. About 400,000 seeds/kg.

Pasture type and use

Widely naturalised on higher-fertility coastal soils. Used for dairy pastures in Queensland, NSW and far-eastern Victoria. Popular in coastal areas of south-west Western Australia for sheep/cattle pastures. Well suited to use as a base for a feedlot as it tolerates trampling, holds the soil, and responds to high manure input. It is also a good lawn grass.

Where it grows

Rainfall

Kikuyu has become naturalised in areas of summer or winter rainfall distribution. While it may grow in areas with average annual rainfall as low as 700 mm in the eastern subtropics, it is really only productive where annual averages are above about 1000 mm. In southern Australia, it is considered to require at least 600 mm in the south east, and 700 mm in the south west. Although moderately drought tolerant, it responds well to irrigation, and produces most active growth during periods of high humidity.

Soils

Kikuyu is widely adapted but prefers fertile, at least moderately drained, light to medium textured soils. It grows best on well-structured, red basalt soils, but also on alluvial and fertilised moist sandy soils. It can tolerate some waterlogging and up to 10 days inundation, as well as moderate salinity levels. It performs best in soils with moderate acidity (pH 5.5-7.0), but tolerates pH as low as 4.5 and the often accompanying high aluminium and manganese.

Temperature

Grows best between 15 and 25°C but will tolerate up to 40°C. Growth ceases when exposed to regular heavy frosts.

Establishment

Companion species

Grasses: Kikuyu should not be sown with other grass species generally although short-lived ryegrass can be oversown in late autumn to provide winter feed.

Legumes:

- Subtropics: creeping vigna, greater lotus, pinto peanut, white clover.
- Temperate: clover (balansa, subterranean, white).

Sowing/planting rates as single species

1-3 kg/ha. The aim is to achieve 30 - 40 plants/m^2. Kikuyu can also be planted vegetatively, in which case, the aim is to have at least one cutting/m^2. Each stem cutting should comprise about 3 nodes.

Sowing/planting rates in mixtures

Kikuyu is generally not sown with other grasses.

Sowing time

The best time to sow kikuyu seed is when the soil temperature is above 20°C and there is a high probability of several days of good soil moisture. It does not grow well in the heat of summer or the cold of winter and is generally sown in autumn (providing seedlings will have developed sufficiently by winter to withstand frost) or spring. Below 20°C, germination may still occur but seedlings will be slower to establish and more susceptible to moisture stress and waterlogging.

Fertiliser

Kikuyu is particularly demanding for nitrogen (N) and phosphorus (P), and soil fertility under the pasture should reflect this. NPK fertiliser at rates determined by soil test results and in consultation with local agronomists should be used at sowing or soon after germination. Caution should be exercised if using a sowing application of some straight fertilisers such as muriate of potash or urea, since they can suppress germination. They may be best used as a post-emergence application.

Management

Maintenance fertiliser

Kikuyu responds strongly to applied P and N and these are usually the limiting nutrients. Soil N should be supplied as spring and autumn dressings of 50-100 kg/ha or through the legume component. P should be applied to maintain soil P levels at or above 15 ppm. Availability of other nutrients, particularly potash, should be monitored and corrected as necessary.

Grazing/cutting

Newly sown kikuyu should not be grazed until the runners are about 20cm long and have taken root. Monitor grazing at this time to ensure runners are not being pulled out. Kikuyu has a reputation for poor productivity and quality. This is largely a reflection of poor management due mostly to under-grazing over summer-autumn and inadequate fertiliser use.

Northern Australia:

Grazing management should aim to maximise leaf and minimise stem. As a rule of thumb, kikuyu grows five leaves and then more stem, so to optimise production, grazing should occur when plants are at the 4.5 leaf stage, and cattle should be removed with a 5cm residue. The pasture is then allowed to grow back to the 4.5 leaf stage (say 15 - 20cm). If it exceeds this, it will need slashing to promote new growth. Hard grazing also encourages clover growth. Established kikuyu should be grazed heavily over summer and autumn to prevent dead material building up.

Southern Australia:

Autumn: From the break, graze to keep the sward looking like mown turf (below 5cm or 1400 kg/ha). This will encourage establishing clover seedlings.

Winter: Maintain grazing pressure to keep pasture below 5cm (or 1400 kg/ha). The aim is to have 30-40% kikuyu content. Rank kikuyu is more likely to be damaged by frost than is well grazed kikuyu.

Spring: Maintain grazing pressure to keep pasture below 5cm (1400 kg/ha). This will require more stock as growth rates increase. Aim for 4.5 leaves per tiller with cattle or 2 leaves per tiller with sheep to maximise quality and quantity.

Summer: Increase the grazing pressure to keep the sward at < 800 kg/ha. This helps prevent the build-up of rank material and encourages clover seed set. In response to summer rain, kikuyu may grow rapidly and grazing pressure will need to be increased accordingly.

In colder, frost-prone areas kikuyu does not compete in winter-spring with annual legumes such as subterranean clover. Grazing management is important to ensure the kikuyu is grazed sufficiently to allow regeneration of the clover sward.

Ability to spread

Kikuyu can spread rapidly from rhizomes and stolons. It is also spread by livestock by seed in the dung or runners caught in their hooves.

Weed potential

It only presents a potential problem in soils of high fertility and can be a problem in cooler areas where it can suppress growth of the more cool-season-productive C3 grasses. As a vigorous creeping grass, it can spread into cultivation areas or water channels.

Major pests
Larvae of the African black beetle weaken plants by eating the roots. Severe infestations of army worms and sod web worms can virtually defoliate a kikuyu stand, particularly if it is well fertilised and lush during warm, wet conditions. A healthy stand can survive such attacks.

Major diseases
Kikuyu Yellows is a root disease caused by a soil borne fungus which can devastate complete stands. This is a sub-tropical disease and is unlikely to be a major problem is temperate Australia. Pyricularia leaf-spot disease causes a leafspot, death of leaf tips, and in severe cases death of seedlings (usually only in plants weakened by nutrient deficiency).

Herbicide susceptibility
Kikuyu is susceptible to glyphosate and can be severely set back by 1 l/ha and killed by 3 l/ha. It is also susceptible to haloxyfop, ethoxyethyl and imazapyr.

Animal production

Feeding value
Well fertilised and grazed kikuyu produces high quality forage. Fresh growth of kikuyu can be higher in quality than lucerne or chicory (e.g. 23% crude protein (CP), 50%NDF, 76% digestibility and 11.6 MJ/kg DM ME). However, after 1 - 2 weeks, the quality declines rapidly to about 10% CP and less than 50% digestibility. Optimum quality coincides with the 4½ leaf stage of regrowth. Sodium levels (at 0.02-0.05% Na) can be deficient for lactating cattle, and calcium levels, although optimal for lactating cows, may be inadequate due to "tie-up" with oxalate. P levels change with season, falling as the species became dormant. Average quality of kikuyu silage has been assessed at 13.5% CP, 64% NDF, 64% digestibility, and 9.7 MJ/kg DM ME.

Palatability
Palatability is high when the sward is kept grazed short and has a significant legume content. Older growth is not readily eaten.

Production potential
Southern Australia:
Dry matter yields are limited by available moisture, soil and air temperatures and fertility level. Production over 11 months at Hamilton, SW Victoria in 2006/07 was 10.7 DM t/ha for a Kikuyu/subterranean clover pasture. This compares with 9.2-10.4 for perennial ryegrass, 8.3 for chicory, 11.8 for lucerne and 12.2 for tall fescue. Response to summer rain at Hamilton in Jan-March 2007 was 1.6 t compared to 0.3 for perennial ryegrass, 0.8 for tall fescue, 1.5 for chicory and 2.6 for lucerne.

Northern Australia:
Under optimum conditions, it is capable of producing 30 t DM/ha/yr. but is unproductive if not fertilised. In general, it produces about 15-30 kg DM per kg N applied. Well fertilised pastures are capable of carrying 1.5-3.0 adult cattle/ha. Dairy cows can produce over 15 L milk/hd/day, and beef animals over 400 kg/ha/yr. LWG from vigorous kikuyu pastures.

Livestock disorders/toxicity
Several livestock disorders are occasionally reported. Lush growth associated with excessive application of nitrogen can result in nitrate poisoning and even bloat, although the latter is rare. Hyperparathyroidism ('big head') in horses, and occasionally nephrosis or hypocalcaemia in ruminants, has been recorded due to high levels of oxalate (up to 1.1% DM). Kikuyu poisoning occurs sporadically in cattle, especially where rapid growth follows a protracted dry period. It occurs only in cattle, affecting all classes and ages. Serious toxicity occurs spasmodically after rainfall, fertiliser application and invasion of pasture by army-worms.

Source: Pastures Australia

Australian Government Rural Industries Research and Development Corporation RIRDC www.rirdc.gov.au

Contact us:

Craig Myall	Managing Director	craig@synergyseeds.com.au	+61 409 392 320
Nathan Smith	Business Sales & Supply Manager	nathan@synergyseeds.com.au	+61 487 655 220

AUSTRALIAN OWNED AUSTRALIAN OWNED

Disclaimer: Synergy Seeds have taken all reasonable care in researching and preparing the information in this publication. While it is thought to be accurate, Synergy Seeds does not accept any responsibility for any negative consequences that may arise from any recommendations or suggestions made. Always seek advice from a local professional prior to purchasing any product.