



## Berseem Clover

### *Trifolium alexandrinum* L.

Plant Symbol = TRAL6

*Common Names:* berseem clover, Egyptian clover

#### Description

*General:* Berseem clover is in the plant family Fabaceae (Legume Family). It is an introduced cool-season annual legume that originated from the eastern Mediterranean region. Berseem clover grows upright to a height of 18 to 31 inches, with hollow stems. Leaves are trifoliolate with oblong, non-hairy leaflets typically in groups of three. Root system is fibrous and typically reach a depth of 4 to 6 inches. Flowers are round and white to yellowish-white in color. Blooms in late spring to early summer, and generally flowers later than crimson clover (*Trifolium incarnatum* L.). Flowers are primarily self-pollinated; however, cross pollination is needed for good seed production (McGregor, 1976; Dixit et al., 1989). Seed is oblong rounded in shape; roughly 5/64" in length and goldish yellow in color.

*Distribution:* Berseem clover is grown as a winter annual in the Southeast with a northern boundary of Kentucky and western boundary of east Texas, and along the West Coast where rainfall limits its range in the coastal region. It is also grown as a summer annual in the Northeast from the Atlantic shore to eastern Montana, with a southern boundary of the Ohio river. It provides good spring forage for livestock in the drier regions of the U.S. when grown under irrigation.

For current distribution in the USA, please consult the Plant Profile page for this species on the PLANTS Web site.

#### Adaptation

Berseem clover grows best on fertile soil, medium to heavy textured soils of mildly acidic to neutral soil pH. It tolerates poor drainage and brief periods of waterlogging (Clark et al., 2007; Hackney et al., 2007); however, in comparison to crimson clover, berseem performed better under wet soil conditions, as observed in 2020, at the USDA-NRCS Booneville, Arkansas Plant Materials Center (ARPMC). Berseem clover does not perform as well as other crops under dry conditions, requiring a minimum average annual rainfall of 21 to 29 inches; performs best with adequate moisture, especially during establishment (Clark et al., 2007). Berseem clover has moderate tolerance of salinity soils. Cold tolerance is slight to moderate with older cultivars rarely surviving temperatures below 25°F (McGregor, 1976; Clark et al., 2007). However, new cultivars have improved cold tolerance with survivability at temperatures near 5°F (Mushrush, 2018). 'Big Bee' and 'Frosty' survived winter temperatures of -11°F with snow cover, and 10°F without snow cover in February 2021 at the ARPMC. There was no visual winter damage observed on the plants the following spring. 'Balady' exhibited moderate visible winter damage. Berseem clover is recommended for plant hardness zone 6b; (Clark et al., 2007; Anderson, 2016). Berseem clover does not tolerate shade (Ehret et al., 2015).

#### Uses

*Cover Crop:* Berseem clover establishes quickly to protect the soil against erosion and suppress weeds. Fibrous roots aids in retrieving and retaining nutrients within the soil profile. Performance is remarkably better than other clover species in wet, poorly drained winter soils. When used in crop rotation, soil health benefits can be observed in the principle crop (Ghaffarzadeh, 1997).



Figure 1. Berseem clover in early bloom stage.

**Green Manure:** Berseem clover is an outstanding nitrogen source, producing around 100 to 200 pounds of nitrogen/acre under vigorous conditions with biomass as high as 6,550 lb/acre (Clark et al., 2007; Mushrush, 2018). These attributes make berseem clover a good choice for building organic matter in the soil and reducing nitrogen fertilizer needs for the subsequent cash crop (Ghaffarzadeh, 1997).

**Forage/Hay:** Berseem clover is non-bloating and highly palatable to livestock. Forage quality is high with 18 to 28 percent crude protein, making forage quality similar to alfalfa (*Medicago sativa* L) (Braunwart et al., 2001; Clark et al., 2007; Hackney et al., 2007). Foliage quality generally declines as plants reach maturity with plant resources going to flowering and seed production (Clark et al., 2007; Hackney et al., 2007); hay should be cut before the onset of flowering. Under optimal conditions, yields of 8 tons/acre/year is achievable (Clark et al., 2007). Early establishment increases the opportunity for multiple cuttings and increased grazing opportunity during the growing season. Cultivar selection is important because some have high growing points that can be easily damaged by close grazing or hay harvest (Hackney et al., 2007). For grazing and hay production, select cultivars with a low growing point such as 'Big Bee', 'Frosty' or 'Multicut' (Clark et al., 2007; Hackney et al., 2007)

**Wildlife Food Plot:** Plant as a polyculture or monoculture; berseem clover is a very attractive food source for wildlife, especially deer and rabbits (Basinger, 2018).

**Pollinator:** Berseem clover is highly attractive to bees, which collect both nectar and pollen from the flowers. Honeybees are the primary pollinators of berseem clover (Narayanan et al. 1961; McGregor, 1976).

### **Status**

Threatened or Endangered: None

Wetland Indicator: None

**Weedy or Invasive:** This plant may become weedy or invasive in some regions or habitats and may displace desirable vegetation if not properly managed. Please consult with your local NRCS Field Office, Cooperative Extension Service office, state natural resource, or state agriculture department regarding its status and use.

Please consult the PLANTS Web site (<http://plants.usda.gov/>) and your state's Department of Natural Resources for this plant's current status (e.g., threatened or endangered species, state noxious status, and wetland indicator values).

### **Planting Guidelines**

Plant berseem clover in fall or spring depending on region adaptability. In the northern region of the US, seed berseem clover in the spring to avoid winterkill. A clean, firm, and weed free seedbed, with adequate soil moisture, is essential to achieve a good stand. Broadcast seed at 15 to 25 lb/acre and or drill at 8 to 14 lb/acre (Clark et al., 2007; Basinger, 2018) to a depth of ¼ inch (Hackney et al., 2007). If seed are broadcast planted, cultipacking or a light drag is needed to cover seed and to ensure good seed-to-soil contact. Higher seed rates create thicker stands and better weed control but may require additional tillage or chemical application to terminate the plant. A thinner stand may be more desirable for forage. Inoculate the seed with *Rhizobium trifolii* (Kishinevsky et al., 1992). There are approximately 200,000 seed/lb (Oushy, 2008).

### **Management**

Berseem clover does best in fields with full sun and moderate to heavy soil texture. As with many legumes, applying N fertilizer restricts nitrogen fixation (Havlin et al., 2005). Apply other nutrients based on soil test recommendations. In sandy or low CCE soils, boron application may be needed for best performance (Clark et al., 2007). Berseem clover tolerates a wide range of soil pH from 4.9-7.8 but does best at soil pH of 6.5 to 7.5 (Oushy, 2008; Evers, 2011). Berseem clover can be managed as a winterkill cover crop in northern regions or terminated mechanically or chemically in the southern U.S. Termination hastens the delivery of nutrients into the soil (Clark et al., 2007) and gives more time to establish a cash crop. Berseem clover may be difficult to terminate without chemicals. Tillage alone may not completely terminate the crop (Clark et al., 2007). Berseem clover has been observed to regrow after being cut to 2.5 inches in full maturity at heights of 10 to 20 inches in field plots at the ARPMC.

Avoid direct seeding into a field with recently incorporated berseem clover, the volatile emissions from residues, will inhibit germination and subsequent seedling growth and development. This is also true in crimson clover and hairy vetch (*Vicia villosa* Roth.) (Bradow et al., 1990). Give green residue time to breakdown before seeding crops. This may take two to four weeks depending on environmental and soil condition.

### **Pests and Potential Problems**

Berseem clover is affected by many of the pest problems as other clover species. Some common fungal diseases in berseem are stem rot (*Sclerotinia sclerotiorum*), root rot (*Rhizoctonia solani*, *Fusarium moniliforme*, and *Sclerotinia bataticola*), damping off (*Pythium spinosum*), and clover scorch (*Kabatiella caulivora*) (Singh et al., 2020). Possible insect pests include aphids, mites, grubs, and Lygus bugs (Clark et al., 2007; Oushy, 2008). Berseem clover may also be affected by root nematodes depending on cultivar resistance (Singh et al., 2020). Berseem Mosaic is a seed transmitted virus that affects berseem clover with cultivar selection being the primary means of control (Singh et al., 2020). Plant damage can occur with high population of rabbits and deer (Clark et al., 2007; Basinger, 2018).

### **Environmental Concerns**

Berseem may be spread by seed and may be considered weedy in some locations. However, there is no confirmation that berseem clover causes environmental concerns.

### **Control**

Control berseem clover by combining integrated management methods of mechanical, cultural and chemical. Reseeding is usually not an issue (Kichler, 2019). Please contact your local agricultural extension specialist or county weed specialist to learn what works best in your area and how to use it safely. Always read the label and safety instructions for each control method. Trade names and control measures appear in this document only to provide specific information. USDA NRCS does not guarantee or warranty the products and control methods named, and other products may be equally effective.

### **Seeds and Plant Production**

Refer to planting guidelines and management for appropriate seeding rates, dates, and planting methods. Berseem is a primarily self-pollinated; however, for best seed production, cross pollination is required (Dixit et al., 1989). Time harvest when most of the seed heads are brown or black. Harvest seed by direct combining or cut/windrow/combine separately. Use chemical desiccation, especially if field is weedy, otherwise chemical desiccate may not be needed (Taylor et al., 1996). Use an air-screen cleaner to remove chaff and unfilled seed. Berseem produces up to 1,000 pounds of seed/acre under optimal conditions (Hackney et al., 2007; Clark, 2007; Oushy, 2008; Evers, 2011).

### **Cultivars, Improved, and Selected Materials (and area of origin)**

Select cultivars based on the local climate, resistance to local pests, and intended use. Consult with your local land grant university, local extension or local USDA NRCS office for recommendations on adapted cultivars for use in your area.

Common cultivars grown in the USA includes: Balady: high growing aggressive foliage producer; Big Bee: moderate tolerance of clover scorch, superior foliage quality, rapid fall growth, and winter hardiness; Carmel: vigorous growth for multiple hay cuttings; Frosty: best winter hardiness, rapid growth, and superior foliage quality; Joe Burton: resistant to virus; Memphis: tolerance of clover scorch; Multicut: heavy forage producer.

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