Forage Legume Notes

Red Clover *(Trifolium pratense)*

Introduction

- Red clover (Trifolium pretense L.) is grown for forage and is used in rotation for soil improvement
- It is distinguished by rapid spring growth and low winter hardiness, which contributes to its short-lived nature
- Red clover is one of the leading forage legumes in Canada, United States and northern and eastern Europe

Growth and Morphology

- Biennial or short lived perennial with a heavily branched taproot
- Stem growth terminates in flower, normally the tap root disintegrates in the second year, plants that survive do so by developing secondary roots
- Locally, red clover can be divided into two divisions: early flowering, double cut; and late flowering, single cut
- Single cut types require a longer photo period to flower
- Leaves and stems are typically pubescent and the leaves are palmately trifoliate with crescent markings in the center of the leaflet
- Seed head color varies from bright red to purple and has been known to be white. Requires at least a 14 hour photo period to flower

Advantages

- Adapted to a wide range of climate conditions
- Tolerates shading (as low as 6% of daylight for seedlings)
- Easy to establish
- Good for renovations (overseeding) because of tolerance to shading and ease of establishment
- High quality forage-red clover stems are higher in quality than alfalfa stems

- Red clover has much higher rumen escape protein (35-45%) than alfalfa and BFT
- Grows well in slightly acidic, less fertile and wetter soils than other legume crops

Disadvantages
- Short lived perennial
- Subject to many diseases- root rots associated with fusarium species are very destructive and responsible for much of the stand reduction- plants under stress are much more susceptible to disease
- Subject to frost heaving
- Does not have as high of yield as alfalfa
- Dusty hay because of pubescence
- Not a self-pollinator
- Can cause bloat in cattle

Climate & Nutrient Requirements
- Prefers heavier, well drained soils
- Doesn't handle drought well so soils must have a high water holding capacity
- Best adapted to moderately cool to warm temperatures and ample moisture through the growing season
- Temperatures are best when they range from 21° to 24°C
- Soil pH of 6.0 to 7.0, ample Ca, P, & K needed for superior growth
- Trace elements of B, Cu, and Mb are also important
    - Boron helps with protein synthesis and increases the seed set
    - Copper aids in respiration and reproductive growth
    - Molybdenum is required in Nitrogen fixation
- Availability of these trace elements depends on soil pH, water availability, soil structure and the ratio of other nutrients

Seeding and Management
- Should be inoculated with Rhizobium bacteria just prior to seeding
- Seed as early in the spring as possible into a warm, moist, firm seed bed at a depth of 1 to 2 cm
- Red clover is often grown with a small grain companion crop such as barley sown at half rate
- Seeding rates will vary according to soil type and intended use
    - Hay mixture sow roller condition @ 2.0kg/ha
    - Haylage mixture sow roller condition @ 3-5 kg/ha
- Should be cut when 25% of the blossoms are showing colour
    - At this stage, the DMD varies between 65 to 70 %
- The three most common methods of utilizing red clover are hay, silage and grazing
    - Hay
        - In hay production, leaves often dry out, become brittle, and fall off before stems dry
        - Roller condition should be used to quicken drying of the stems
    - Silage
        - Excellent results when feeding to dairy & beef cattle
        - High protein content can present problems with fermentation
        - Recommended to wilt clover down to a DM content of 25% to 35%
    - Grazing
        - Not recommended to graze pure stands because red clover can't handle intensive or prolonged grazing

- Bloat can occur in cattle that graze immature red clover
- Possible reduction in fertility of ewes because of estrogenic isoflavones

Pests

- Red clover suffers from many pests and it is these pests which ultimately diminish the stand
- The majority of pests are diseases such as northern anthracnose, powdery mildew, sclerotinia crown rot and root rot
- Insect pests range from clover root curculio, root borer, clover seed chalcid, clover seed midge, potato leaf hopper and the pea aphid

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