



6-1980

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A. J. Powell Jr.
University of Kentucky

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AGR-83

SLOPE STABILIZATION WITH CROWN VETCH

ISSUED: 6-80

REVISED:

A. J. Powell, Jr.

Department of Agronomy

Advantages and Uses of Crown vetch

Once established, crown vetch provides an excellent, almost maintenance-free, cover for soil stabilization and slope beautification. It grows approximately two feet tall and blooms from June through September, producing pink to pinkish-purple flowers. Crown vetch is strongly rhizomatous (underground root stalks) and grows well on clay textured and shallow soils. It is highly recommended for low maintenance areas such as slopes around commercial or public buildings, highway and/or driveway slopes, lawn areas too steep for safe mowing and slopes associated with many recreational facilities or parks.

Major Limitations

- The foliage of crown vetch will die back after the first few freezes and remain brown until dormancy breaks the following spring. In Kentucky, this is normally December through March.
- Crown vetch is slow to establish, requiring from two to five years.
- Because Kentucky is located in the southern-most area of crown vetch adaptation, it performs best and establishes quicker on north facing (cooler) slopes.
- Crown vetch will be seriously injured if mowed more than once or twice per year.
- Occasionally certain broadleaf weeds such as wild lettuce and thistles must be rogued from crown vetch beds to improve its aesthetics.

Seedbed Preparation & Fertilization

It is useless to attempt crown vetch establishment without proper soil amendments and preparation. Crown vetch is a legume that will not establish on unlimed acid soils. Contact your local agricultural Extension agent to obtain soil test information and recommendations. From two to four tons per acre of ground agricultural limestone may be required to reduce the acidity and adjust soil pH to a desirable level.

Because of its slow seedling vigor, fast germinating grasses must be seeded with crown vetch in order to reduce the immediate erosion hazard. In order to get good establishment of the companion grass, it is necessary to apply some nitrogen. In most cases, nutrient needs for establishment can be provided by applying approximately 50 lbs/acre of actual nitrogen, 100 lbs/acre of P_2O_5 and 100 lbs/acre of K_2O . This is equivalent to applying 1000 pounds of 5-10-10 fertilizer per acre (25 lbs/1000 sq ft), or 500 pounds per acre of a 10-20-20 fertilizer (12 lbs/1000 sq ft). A soil test is needed to determine the exact needs.

For best establishment, lime and fertilizer should be worked into the top four to six inches of soil. Do not prepare a fine, fluffy seedbed. Since many sloping areas will not likely be mowed, leave the seedbed as rough and non-uniform as possible. The presence of rocks, large clods or even stumps will help stabilize the soil and improve the microenvironment for better crown vetch establishment. However, it is important to loosen the soil in order to get good soil-seed contact. On steep slopes where the incorporation of lime and fertilizer is unfeasible, shallow furrows or grooves (about 2 inches deep and 2 feet apart) should be made laterally along the slope. This rough seedbed and/or furrows will help hold additional moisture and fertilizer to give quicker establishment.

Establishment

Planting

Most crown vetch is established by seeding. However, crown vetch plugs or peat-potted plants are often available. These are usually more expensive, require much hand labor to set the plugs (usually planted on

2 feet centers), and seldom increase the rapidity of establishment. Also some irrigation may be required to insure survival of the small crowns. Similar soil preparation is needed with either planting method.

Varieties

Penngift, Chemung and Emerald are varieties of crown vetch commercially available.

When to Seed

The best time to establish crown vetch is from mid-February through March. The second best establishment time is from mid-August to mid-September. Seedings made in late-spring through early-summer are seldom successful due to heat, drought and weed competition. Young plants from seedings made after mid-September are often not hardy enough for good winter survival.

Seeding Rate

Use from 15-20 lbs/acre (1/2 lb/1000 sq ft) of crown vetch seed. This seed is usually very expensive because it is difficult to produce and harvest. Also it has an extremely hard seed coat that must be scarified.

In order to stabilize the soil while crown vetch is becoming established, it is necessary to also include 40-60 lbs/acre (1 lb/1000 sq ft) of KY 31 tall fescue. If extreme erosion potential exists, add 5-10 lbs/acre (1/4 lb/1000 sq ft) of annual ryegrass.

Inoculant

The inoculant is a specially grown and very specific microorganism. Once in the soil, this organism fixes itself to crown vetch roots, captures atmospheric nitrogen and after degradation, supplies this essential nutrient to the plant. Most commercial sources of crown vetch seed also provide a small plastic bag of inoculant with directions for proper use. When using the hydro-mulching method of establishment, it is important to super-inoculate by using about five times the specified amount. Because the inoculant is perishable, it should be kept cool and dry before using and applied to the seed (or tank) just prior to application. Do not use inoculant labeled for hairy vetch.

Conventional vs. Hydromulching

The seeding mixture should be broadcast evenly over the soil surface. This can be done by hand or with conventional seeding equipment.

Because of the severity of certain slopes and the need to purchase commercial mulch materials, the hydromulcher is often used in seeding crown vetch. It is possible to include the woodfiber mulch, fertilizer, lime, seed and inoculant in the hydromulcher tank to be applied as a slurry. However, it is usually more successful if the seed, inoculant and mulch are applied after the fertilizer and lime have been worked into the surface soil.

Mulch

Establishment is hastened and soil erosion is lessened if an appropriate mulch can be applied. For small areas, evenly spread one to two bales of clean straw per 1000 sq ft. This straw can be held in place by use of string and stakes laced back and forth across the slope. For larger areas, it is necessary to use a straw blower and apply a tacking agent such as asphalt. This requires 50-60 bales (3000 lbs) of straw per acre. When woodfiber mulch is applied with the hydromulcher, use approximately 1500-2000 pounds per acre. Additional sources of mulch would include cheesecloth or used tobacco canvas, woodbark or woodchips (50-75 cu yds/acre), etc.

Seeding Into Existing Vegetation

Crown vetch may be desired on slopes where some existing vegetation is already established. Because of the possibility of severe erosion when the soil is disturbed, it is usually unfeasible to kill existing vegetation and completely re-establish. If the existing vegetation is thin, crown vetch can often be

established successfully with minimum soil preparation by seeding in late February or early March while the soil is honeycombed from freezing and thawing. It is helpful if additional soil scarification can be obtained by using a rake, hoe or open-disk. Good soil-seed contact is necessary. When using this method, seed with the recommended rate of crown vetch and apply the appropriate inoculant, lime and phosphate-potash fertilizer. Do not use the tall fescue and nitrogen fertilizer if enough vegetation is present for soil stabilization.

Crown vetch Maintenance

Very little maintenance is required. Soil tests should be taken every five to ten years to determine if additional lime, phosphate or potash is needed.

In the preparation of this publication, the author wishes to acknowledge the professional consultation received from Mr. Carl Wells and staff of the Department of Transportation, Frankfort.