Kansas Rural Center
SUSTAINABLE AGRICULTURE
MANAGEMENT GUIDES

HAIRY VETCH

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Hairy vetch is a climbing, prostrate or trailing legume that is often used as a winter cover crop. Vetch has good tolerance to adverse soils, low or high rainfall, and a wide pH range between 4.9 and 8.2 (Duke and James, 1990). The root depth is 1-3 feet (Schmid and Klay, 1984). It grows best, up to waist height, when it can climb up another plant such as a small grain. Vetch has showy violet or purple flowers. Under a heavy canopy of another crop, hairy vetch will begin to regress, stretch out and become prostrate. However, it has the ability to regrow with later light penetration (Hofstetter, 1982).

Crop Rotation Management

Hairy vetch can emerge through three to four inches of bermudagrass because of its larger seed size (Rommann, 1989). Most of its growth comes in late spring during the month of May. This late spring growth pattern makes it a likely candidate for rotating to grain sorghum rather than corn. Hairy vetch produces hard seed that can remain in the soil for many years. Since hairy vetch has a climbing growth characteristic and a similar growing season to cereal grains, it can be a significant weed problem in crops like wheat. A good rotation recommendation is for two years of row crops following hairy vetch before returning to a cereal grain (Kilgore).

Nitrogen Credits

Hairy vetch is generally considered to be the best of the legume winter cover crops for nitrogen production. Nitrogen credits can range between 45-180 pounds per acre (Smith et al. 1987).

Yields of hairy vetch planted in mid-September following winter wheat in Kansas State University station trials near Hesston showed a range of 2.66-2.99 tons per acre dependent on termination dates. The corresponding potential N contribution ranged from 147-188 pounds per acre for the succeeding sorghum crop. In a season with ample rainfall, delayed vetch termination tended to result in higher sorghum leaf nitrogen levels and grain yields, but treatment differences were not always significant. The positive effect of the early and late termination dates of vetch on the yield of sorghum without fertilizer nitrogen was equivalent to 70 and 89 pounds per acre of nitrogen. Sorghum yields after vetch averaged over nitrogen rates were 6-10 bushels per acre more than without a preceding cover crop (Claassen (a), 1997).

In a KSU tillage trial, hairy vetch planted in mid-September following winter wheat produced 2.05 tons of dry matter by the time it was terminated the following May. Vetch contained an average of 128 pounds per acre of nitrogen. Method of vetch termination (no-till vs. disk) had no effect on grain sorghum flag-leaf nitrogen concentrations or on yields. Vetch significantly increased sorghum leaf nitrogen and also increased sorghum grain yields by nearly 22 bushels per acre in the absence of fertilizer nitrogen. The apparent nitrogen contribution to sorghum yields by the vetch was approximately 58 pounds per acre (Claassen (b), 1997).

Soil Moisture

In Kentucky, hairy vetch depleted soil moisture at the time of corn planting to a depth of two feet. Two weeks after no-till planting the corn, the vetch mulch had begun to conserve water in the top six inches of soil which lasted the rest of the season. However, the soil water was not replenished below 12 inches for the entire growing season (Frye and Blevins, 1989).

Seed Production

Variety yields for seed production ranged from 200-540 pounds per acre (Hargrove). If sown in the spring, vetch may not go to seed (Hofstetter, 1982).

Grazing Management

Colin Cargill has planted vetch for cattle grazing for 25 years on his farm near Isabel, Kansas. He plants a mixture of rye at 1½ bushels per acre with one pound of hairy vetch seed per acre on marginal cropland in an

area with average rainfall of 28" per year. Care is taken to not use fields that are adjacent to wheat fields since the vetch can spread across fence rows. The rye/vetch mixture may be grazed in fall dependent upon growth. If the stand is thin and weather permits he may interseed oats in the spring to fill in the stand. The forage can be grazed till March and then baled in May. Rye matures earlier than vetch while the oats mature similarly to vetch. The vetch is allowed to regrow and set seed. The seed may be harvested. Shattered seed will serve as later volunteer vetch. If one prefers to spring graze instead of haying, it can be grazed through June and then let to reseed during July. Cargill has found steers can gain two pounds per day with good spring grazing. The ground is worked once to prepare for rye to be replanted in August. The vetch volunteers back into the rye. The field will remain in rye/vetch for haying and grazing until three or four years later when the sprawling vetch begins to choke out rye. The land is then worked and planted to grain sorghum to thin out vetch. After grain sorghum, the land is then replanted to rye and the vetch will reseed itself. Cargill hasn't found cattle bloating on vetch to be a problem. Cattle will have to be trained to eat vetch in the beginning (Cargill).

Vetch seed consumption can cause poisoning, bellowing, sexual excitement, and convulsions in cattle (Duke and James, 1990). Cattle with black hair coats more than three years of age grazing on pastures with large amounts of hairy vetch seed are especially vulnerable. The consumption of seed can lead to delirium, dermatitis, conjunctivitis, anorexia, weight loss, elevated temperature, diarrhea, and death. Early symptoms are skin lesions on udder, tailhead, and neck. Morbidity from hairy vetch poisoning can be 6-8% and mortality can be 50% (Hofstetter, 1982).

Varieties

Madison vetch is a strain developed in Nebraska. Lana Woollypod vetch can be turned under two weeks earlier than other vetches without sacrificing dry matter yield loss (Offutt, 1955).

Winter Hardiness

The following legumes are ranked on a scale of 1 (most winter hardy) to 9 (least hardy): hairy vetch - 1; Austrian winter peas - 4.5; white lupines - 5.8. Hairy vetch is considered the most winter hardy of legume cover crops (Smith and Varco, 1987). Hairy vetch's greater tolerance of cold temperatures increases the time hairy vetch requires in spring to produce adequate quantities of nitrogen (Ott and Hargrove, 1989).

Establishment

A general seeding rate is 15-20 pounds per acre. Ideally vetch should be planted 50 or 60 days before killing frost. Plant at least 30 days before a killing frost. Better stands are achieved when soil moisture is up and soil temperatures are down ("Cover Crop Guide," 1988). Broadcast before September 15 or in February when overseeding. When drilling, plant to a depth of ¾ inch ("Cover Crops Management for No-till Grain Crop Production," 1986). Hairy vetch produced more when broadcasted in mid-September than when drilled in mid-October in Kentucky (Smith and Varco, 1987). If overseeding into soybeans, broadcast at leaf-yellowing or early leaf drop (Duke and James, 1990).

Blended Seeding

Vetch sown alone is vulnerable to frost heaving. Planting with the deeper taprooted rye plant protects vetch from heaving and provides an upright stem for climbing. Vetch decomposes rapidly and releases its nitrogen quickly. The higher carbon ratio of rye helps "trap" the nitrogen so the next crop can utilize it better (Chonbeck, 1988). A mix of 10% vetch, 20% wheat, and 70% rye can be used for grazing (Delang Seed Company). The Thompsons near Boone, Iowa plant 10 pounds per acre hairy vetch with 30 pounds per acre oats drilled on the ridge in a rotation to corn the following year ("The Thompson On-Farm Research," 1991).

Inoculation

Seed innoculation is important to nitrogen fixation. Vetch needs to be inoculated even in soybean ground (Ferguson, 1989).

Termination

The corn grain yield was higher when vetch was disced under rather than left growing or chemically burned down. This was not believed to be due to any nitrogen response or soil moisture differences, but possibly because of some unknown rotational effect and related changes in microbial activity in soil (Koerner and Power, 1987). Preliminary Ohio research showed hairy vetch could be effectively killed by mowing at mid-bloom and provided 90-95% weed control in corn through early August and 66-79% weed control by the end of August ("Sustainable Agriculture," 1990).

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CREDITS

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