



Annual Ryegrass

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Annual ryegrass (*Lolium multiflorum*), a multipurpose European import, is often chosen as a “living sod” cover crop in vegetable and fruit crops. Its vigorous root system tenaciously holds the soil against erosion while improving soil organic matter levels, increasing water infiltration, and reducing nitrate leaching. Annual ryegrass is considered a good fodder grass, especially when grown with a legume, giving the farmer livestock grazing options.

Characteristics

Annual ryegrass, also known as Italian ryegrass, is a cool season annual bunch grass that grows to 3–4 ft (0.9–1.2 m) tall. It is yellowish-green at the base, with glossy leaves. The plants form an extensive, dense root system, even in low fertility and acidic soils, which makes it a good candidate for use for erosion control on sloping fields and grassed waterways.

Environmental requirements

Annual ryegrass grows on a wide variety of soil types and has a preferred soil pH range of 5.5–7.0. It does well on heavy, temporarily waterlogged soils if well established. It does not tolerate shade for extended periods. Annual ryegrass is best suited to higher, cooler elevations and humid areas. In Hawaii, it can be planted year-round at elevations above 1500 ft. At lower elevations, the best time to plant annual ryegrass for optimum growth is during the cooler, winter months.

Cultivars

The standard annual ryegrass cultivar recommended in Hawaii is ‘Tam 90’. ‘Alamo’ and ‘Tam 90’ showed good potential as cover crops in CTAHR research conducted

Benefits provided by annual ryegrass

EXCELLENT for increasing organic matter and improving soil structure, for providing erosion control, for quick growth and establishment

VERY GOOD for taking up and storing soil N and preventing its loss to leaching, for suppressing weeds, for providing lasting soil residue

GOOD forage production, nutritional quality, and palatability

SUITABLE for higher elevations, winter season

USE IN “living sod” cash crop systems to reduce soil splashing, improve crop quality, and possibly suppress disease and pest incidence

USE IN rotations or intercrops with vegetables, root crops, herbs, cut flowers, and ornamentals



on Hawaii, Molokai, and Lanai. Positive traits observed in these varieties included vigorous growth, rapid soil cover, weed suppression, low plant height, and a lack of flowering.

Establishment

Broadcast a minimum of 40 lb/acre or drill 10 lb/acre (0.2–0.4 bu/acre) pure live seed in a well prepared, weed-free field. Sow at a depth of about $\frac{1}{4}$ – $\frac{1}{2}$ inch.

Uses

Soil improvement

Annual ryegrass produces about 1.5 tons/acre of dry matter containing about 13 lb of N per ton. Winter (February to late March) fresh weight biomass yields at CTAHR's low elevation Waimanalo Research Station on Oahu were about 6100 lb/acre at 2 months after planting with plants mowed when 15 inches tall. Tissue N content is about 1.3%. For optimal decomposition of the crop residues, add 25 lb N per ton of dry matter at plowdown. The addition of this N fertilizer will promote microbial activity and prevent the decomposing plant material from tying up soil N needed by the following crop. Alternatively, plant a mixed cover crop stand of annual ryegrass with a legume to minimize potential N immobilization after cover crop plow-down. Allow 2–3 weeks before planting the cash crop to allow time for residue decomposition.

Annual ryegrass is widely used for soil conservation purposes. Farmers will see improvement in their topsoil layer as a result of this grass's fine, fibrous root system.

Grass cover crops such as annual ryegrass are woodier, more fibrous, and higher in carbon than legumes. Their residues break down more slowly, are more stable, and last longer in the soil. With careful management, the farmer can successfully improve soil health and build up valuable organic matter by using grasses such as annual ryegrass. The additional incorporated organic matter will improve the ability of the soil to store and release plant nutrients by increasing its cation exchange capacity. The organic matter additions also support a more complex soil "food web," with its microbial population that may compete with and even suppress soil-borne pathogens and nematodes.

Weed control and "living sod" systems

Annual ryegrass helps to smother weed growth because of its rapid establishment, seedling vigor, and strong competitive ability against weeds. This grass is also

popular as a living sod, where the cover crop is grown to suppress weed growth between rows of a cash crop. Living sod systems also tend to reduce splashing of soil onto vegetable and fruit crops. As a result, farmers should see reduced disease outbreaks and improved crop quality. Other benefits obtained from the use of living sod systems also include organic matter production, promotion of habitat for beneficial insects, erosion prevention, wind protection, and better surface traction for equipment.

Rotational grazing options

Annual ryegrass is considered a good forage grass, especially when intercropped with a legume.

Nurse crop

Annual ryegrass can also be used, when planted at low densities, as a nurse crop for establishing legume cover crops. If it grows too vigorously, the grass can be mowed to allow better growth of the legume.

Management cautions

Annual ryegrass is a heavy user of soil N and water. When grown as a living sod, farmers should manage the system carefully so that the cover crop does not strongly compete with the cash crop for irrigation water or fertilizer. Annual ryegrass can become a weed if allowed to set seed.

Pest problems

Annual ryegrass attracts few insect pests and can generally help reduce insect pest levels in legume stands and many vegetable crops such as root crops and brassicas. Mites may become a problem in dry weather. When it is used as a living mulch, rodents may become a problem. Choose rust-resistant varieties, as crown and brown rust can occur. Annual ryegrass can host pin nematodes (*Paratylenchus projectus*).

For assistance:

Contact your nearest Cooperative Extension Service office for additional assistance in selecting appropriate cover crops and green manures for your farm and cropping situation. Help can also be obtained from the USDA Natural Resources Conservation Service field offices located on each island.

Visit CTAHR's Sustainable Agriculture for Hawaii Program Website at <<http://www.ctahr.hawaii.edu/sustainag>> to find additional information about green manure and cover crops. The site also includes references and links to other useful on-line resources.

**Sustainable Agriculture in Hawaii . . .**

. . . integrates three main goals—environmental health, economic profitability, and social and economic equity. Sustainable farms differ from conventional ones in that they rely more on management practices such as crop diversification and crop rotation, agroforestry, integrated pest management, rotational grazing, and innovative marketing strategies. For further information on Sustainable Agriculture in Hawaii, contact:

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