United States Department of Agriculture

‘Aroostook’ Cereal rye

Secale cereale L.

A Conservation Plant Release by USDA NRCS Big Flats Plant Materials Center, Corning, NY.

Seed heads of Aroostook rye, taken at the Big Flats Plant Materials Center, 2013.

‘Aroostook’ cereal rye (*Secale cereale* L.) is a cultivar released in 1981 in cooperation with the New York State College of Agriculture and Life Sciences, Cornell University, and the Maine Department of Agriculture, Division of Plant Industry.

Aroostook was selected for use as a cover crop plant for northern Maine, and other areas with short growing seasons, following late harvested crops such as potatoes. There were 800 rye cultivars and accessions tested. Aroostook rye produced significantly more growth when seeded in the fall, produced more spring growth, and exhibited more winter hardiness than others tested.

Description

Aroostook is an annual tall, cereal grain averaging 4 feet. It has narrow, dark leaves and slightly curved heads at maturity. It is the most winter hardy small grain and matures the earliest. The seed is medium sized and is about 2.5 mm wide by 7.5 mm long. Aroostook seed can germinate when the soil is 50º F, and can put on vigorous growth when sown as late as September 30.

In New York, rye starts growing in late March and matures by early to mid-July. Juvenile plant growth is prostrate providing good ground cover when it is planted early in the fall.

Source

Aroostook was selected as a cover crop plant for Northern Maine and other short season areas. It was developed specifically for seeding after late harvested crops to protect intensively cropped fields from erosion and to sequester residual nitrate from crop production. Aroostook rye was selected after evaluations, at the Big Flats Plant Materials Center, from 800 unnamed and named winter ryes, foreign and domestic. The 43 most promising varieties and strains were then evaluated at the Aroostook State Farm in Presque Isle, Maine. In subsequent trials, Aroostook out preformed both 'Tetra Tetkus' and 'Balbo' varieties in large-scale plantings. The winter hardiness, early spring recovery, and vigor also exceed that of other varieties.

Conservation Uses

Cover Crop:

Aroostook is used as a cover crop to reduce soil erosion and soil compaction, weed suppression, increase organic matter, and improve soil health. It is effective at taking up excess nitrate in the fall and in the following spring and summer, nitrogen is released when the rye is plowed under or burned down. Yields of Aroostook vary according to weather, soil fertility, and planting and harvesting dates.

Aroostook can also be valuable in organic farming. It exhibits allelopathic effects to control weeds, and will release nitrogen and add organic matter into the soil after it is incorporated.

Aroostook is particularly good in protecting soil that is planted to potatoes, corn, and soybeans. To be most effective as a cover crop, it should be planted as early in the fall as possible.

Green Manure:

Aroostook can also be used as a green manure. It helps reduce erosion and will improve soil structure, aeration and water holding properties. To get the most benefits as a green manure, Aroostook should be planted early, fertilized at planting, and then top-dressed in the spring with nitrogen. The rye should then be plowed under or killed before it is fully mature, since young plants are higher in nitrogen. The best time to plow is when the rye is knee high or until it is beginning to head. Rye covers are effective at up-taking excess nitrate in fall. This nitrogen is released from decomposing rye during the following spring and summer

Forage Crop:

Aroostook can also be used as a forage crop. In late fall and early spring, it can be pastured. However, in most areas of New York, fall grazing is limited because rye growth slows fairly early by the onset of cold weather. It will produce early growth in the spring, before other grasses are ready for grazing. Younger rye plants are a high quality feed.

Area of Adaptation and Use
Aroostook can be grown in a wider range of environmental conditions than any other small grains. It is very winter hardy in the northeast United States. It has a short germination period under lower temperatures and grows quickly. In Maine, it produces sufficient fall growth to provide some soil protection over winter when 26-35 growing degree days (base 40º F) remain after planting.

Aroostook is most productive on well-drained, fertile soils, having a pH of 5.8 or higher, but can be grown on relatively infertile acid and sandy soils. It will grow better on light loams and sandy soils than on heavy clay soils. It is fairly tolerant of droughty conditions, and production is very limited on wet, poorly drained soils.

Aroostook is mainly used as a cover crop after later harvested crops such as corn. In Maine, it produces sufficient fall growth to provide some soil protection over winter. The later the planting date, the less biomass accumulated in the fall. Late August plantings can produce about 1000-1500 dry matter lbs per acre when harvested in November, and 4000 lbs per acre of dry matter when harvested late spring.

Establishment and Management for Conservation Plantings
Aroostook can be drilled using a conventional grain drill, broadcasted, and aerial seeded.

Drilling: Aroostook is best established using a grain drill, planted 1" deep, between 1-2 bushels per acre (56-112 lbs/acre), and followed by cultipacking.

Broadcast: Aroostook can also be established by broadcasting the seed immediately followed by a light and shallow disking and cultipacking, at a rate between 2 bushels per acre (112 lb per acre). Aerial seeding rye can also be flown into standing corn in August.

Seeding Rates/Dates:
Aroostook is seeded in August-September for northern Maine and other areas of the Northeast. However, it can be seeded as late as October to November for warmer areas. Typical seeding rate is 100-112 lb per acre.

Aroostook can also be seeded in mixes with other cover crop species such as legumes, other grains, and broadleaves. Rates of rye in mixes will depend on the resource concern, species and number of species in each mix, planting date, crop rotation, forage usage, tillage system, planned future crop, soils etc. When sowing Aroostook as a cover crop or green manure, plow under when spring growth is between 8-12" tall.

Grazing Management:
When seeding Aroostook for grazing, seed as early as possible, usually August to early September. It can yield 1 ton of dry matter per acre. Fall grazing should be delayed until plants are well established (6-8 inches tall). Grazing height should be only to, 2-3 inches to avoid complete removal. Spring grazing can yield 2 ton of dry matter per acre.

Fertilization:
A soil test should be performed before planting Aroostook rye to ensure proper establishment and high yields. Nitrogen increases vegetative growth and promotes tillering. Typical N fertilizer rates are 30 lb of N per acre in the fall and 30 lb top-dressed in early spring. A study performed by Cornell University in 2013 showed that the optimal N rate, at spring green-up, was 68-80 lb/A of N. The optimal N rate used was based on a forage price of $250/ DM ton and fertilizer prices between $0.80-$0.50/lb of N.

Rolling:
When Aroostook is used as a cover crop it can be terminated using a roller-crimper implement. Rolling rye will decrease energy usage, is faster, and needs to be done once. The resulting rye residue is intact, and forms a thick mat that provides weed suppression. If rye is rolled too early in the spring, it won't die, and will grow back, using moisture that the following crop needs, and therefore reducing cash crop yields. The best time to roll rye is when it reaches 50-75 percent of its flowering stage.

Planting after Corn Harvest:
When corn silage is harvested in the fall, there are few cover crop species that can be planted at this time and still produce sufficient biomass for erosion control, add organic matter, and provide benefits to overall soil health. Aroostook because of its winter hardiness, can be seeded after late-harvested crops in the Northeast. Timing corn harvest with cover crop planting is essential to maximize corn yields but also maximize the soil health benefits rye provides. Combining Aroostook with a shorter season corn can provide adequate cover in the fall and spring and can scavenge high amounts of nitrogen.

Ecological Considerations
Aroostook could potentially reduce crop yield production when crop seed is planted immediately following rye cover crop destruction due to allelopathy. When cash crops are planted 2 weeks after spraying or plowing of the rye cover, the effect is insignificant. Aroostook is prone to lodging but will resist lodging while it is actively growing.

Seed and Plant Production
Aroostook is easily cross pollinated. Production of certified seed requires planting of foundation or registered seed. Production procedures must meet minimum certification standards. Seed treatment is not necessary.

Aroostook rye seed heads at seed harvest. Photo was taken at the USDA NRCS Big Flats Plant Materials Center.

Plant Aroostook1" deep in 7"-8" row spacing, using a grain drill, followed by packer wheels or cultipacking. Aroostook rye should be seeded between August 15 and September 10. Seeding rates and dates should be adjusted for warmer climates. For seed production, it should be seeded between 1-2 bushels per acre (56-112 lb/acre). Current soil tests are recommended and will indicate the need for fertilizer requirements for optimal seed production and plant growth. Aroostook should be harvested when seeds contain approximately 18-20% moisture content and dried down to 12% moisture at temperatures not exceeding 100ºF.

Availability
For conservation use: Aroostook is routinely available in the commercial market. Contact commercial nurseries that sell Aroostook or contact your local NRCS office or Soil and Water Conservation District.

For seed or plant increase: Foundation seed of Aroostook can be obtained by contacting the USDA NRCS Big Flats Plant Materials Center, New York.

For more information, contact:
USDA NRCS Big Flats Plant Materials Center
3266 State Route 352
Corning, New York 14830
607-358-6009 (phone)
1-855-401-1955 (fax)
http://plant-materials.nrcs.usda.gov/nypmc/

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