

Grass Seed Production in the Willamette Valley, Oregon

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Oregon is the national leader in the production of cool-season grass seed crops and is known as the "Grass Seed Capitol of the World." In 1990 Oregon harvested 500 million pounds of seed from about 400,000 acres of grass. The harvest provided a farm gate value of \$195 million. Grass seed is the fifth most valuable agricultural crop produced in Oregon. Over 90% of grass production is in the Willamette Valley. Cool season grasses grown in the state include:

Agrostis sp., bentgrass

Dactylis glomerata, orchardgrass

Festuca rubra, fine fescue

Festuca arundinacea, tall fescue

Lolium sp., ryegrass

Poa sp., bluegrass

The state produces both forage and turf cultivars. Oregon's rise to world-wide prominence in grass seed production did not happen over night. Growing began nearly 100 years ago.

HISTORY

Oregon's grass seed industry started in the late 1800s. The earliest harvests were from native grass stands found on the flat open prairies of the southern Willamette Valley. Velvetgrass, *Holcus* sp. was harvested and barged down the Willamette River to Portland before the turn of the century.

By early 1900, ryegrass seed was being cleaned from cereal crops grown on the ridges in the south valley where soil drainage was adequate to support wheat and oats. Ryegrass was a weed in many of these fields. Growers cleaned it from their grain after harvest and marketed it through local seed dealers.

The year 1921 marked the first commercial planting of ryegrass specifically for seed production. Early plantings consisted of native or unnamed cultivars found locally or imported by local seedsmen.

The first attempt, in 1931, to grow certified perennial ryegrass in the south Willamette Valley was unsuccessful. The field, planted with seed from New Zealand, froze out. In 1932 more certified seed was imported. A second attempt was successful and the 10 acre field produced Oregon's first certified ryegrass. Ryegrass seed acreage gradually increased and by 1938 an estimated 44,000 acres were planted.

As grass seed acres increased, so did two disease organisms that caused significant yield and quality problems. The problem fungi were ergot, *Claviceps purpurea* and blind seed disease, *Gloeotinia temulenta*. By 1945 growers and USDA plant pathologists at Oregon State College in Corvallis had discovered that open field burning of the straw residues after harvest controlled the diseases. In addition, burning reduced weed problems and controlled various insect pests.

Open burning became the accepted practice throughout the Willamette Valley. It has helped lead the way for Oregon's grass seed industry to become the world leader in the production of high quality grass seed.

PRODUCTION

Several factors contribute to the Willamette Valley's prominence in grass seed production.

Climate and Soils. The Willamette Valley has an ideal climate for quality grass seed production. Average annual rainfall ranges from 35 to 50 in. with 90% falling between October and May. This supplies enough moisture for good fall plant establishment, winter vegetative growth and spring seed filling. Harvest months, July and August, are typically dry, allowing for maturation and harvest under ideal conditions. Artificial drying is not necessary.

Winter temperatures are low enough to provide vernalization and stimulate seed production yet mild enough for winter growth without crop damage. Average December through February temperature on the central valley floor is 40° F. This period has an average daily minimum temperature of 35° F. In the south Willamette Valley, fields are flat with heavy, poorly-drained clay soils. The high winter rainfall and heavy soils make it unsuitable for other crops. Ryegrass and tall fescue seed crops are well adapted to these soil conditions and have become the primary agricultural commodity

The foothills along the east side of the valley are also good for seed production. Early grain production on the steep, shallow soils caused serious soil erosion problems. In addition, rocks in many of the fields made annual cultivation difficult and costly. The establishment of fine fescue and bentgrass crops in this area provided the long term perennial crop cover needed to solve the erosion problem

As the economics of growing grass seed improved and production of turf-type cultivars increased, production expanded to better soils in the northern end of the valley. Land traditionally used for raising wheat, legumes, and vegetable crops were converted to grass seed production.

Industry Infrastructure. As the seed industry grew, many farmers began specializing. They eliminated some of their other crops and livestock enterprises. Barns were converted to seed cleaning facilities. Over 280 approved seed cleaning plants currently operate in the valley. They range in cleaning capacity from less than 100,000 to over 20 million pounds annually. Many of the facilities are grower-owned but commercial operations also provide seed cleaning services to area farmers. The abundance of seed cleaners provides for processing and shipment of seed on a timely basis as the market demands.

The development and acceptance of innovative production techniques give growers the ability to produce high quality seeds. USDA Weed Scientist, Dr. Orvid Lee, pioneered the planting technique of "charcoal band" seeding of perennial ryegrass. A slurry of activated charcoal, water, and fertilizer is sprayed directly over the seed row during planting. The herbicide diuron (Karmex) is then broadcast over the field controlling grass and broadleaf weeds between the rows. The charcoal band de-activates the herbicide and allows the newly-seeded ryegrass to emerge without injury. Weed-free seed is produced the first production year using this technique. Most turf-type perennial ryegrass and fall-seeded, turf-type tall-fescue fields are planted using this technique.

Research and Quality Assurance. New cultivar development work is being conducted by the private seed company plant breeders. Research efforts by OSU and USDA scientists focus on improved weed and disease control programs and improved agronomic and crop management practices. Recently, efforts to find

alternatives to open field burning have occupied much of the private and public research work.

OSU's seed certification program plays an important role in the development of the seed industry. Field history requirements, seed field inspections, and production of seed meeting high purity and germination standards assure quality seed reaches the consumer. Since its organization in 1916 the certification program has become widely recognized for its size and emphasis on quality. There are over 700 certified seed cultivars grown in the state. Over half of the grass-seed acres is in certified cultivars. The program is an active participant in an international certification program sponsored by the Organization for Economic Cooperation and Development (OECD). This assists the seed industry by facilitating seed movement into international markets. Willamette Valley grass seed is sold to every state and exported to 60 foreign countries.

THE FUTURE

The seed industry faces several important issues. Oversupply and increasing restrictions on open field burning top the concerns.

Acreage increased by nearly 100,000 from 1985 to 1990. Drought conditions in the U.S. southwest and reduced housing starts in the eastern U.S. resulted in a large carryover of perennial ryegrass and tall fescue seed. As production is curtailed, growers face lower prices and reduction by as much as 30% of their contracted acres.

Open field burning continues to be restricted by legislative and regulatory actions. By 1998 open field burning will be reduced to under 40,000 acres and all propane burning will require strict emissions requirements. Increased fees will be charged for all burning.

Oregon State University, in cooperation with the Oregon Department of Agriculture, Department of Environmental Quality, and the Oregon Seed Council is searching for field management methods without burning and for expansion of straw markets. With an estimated 1 million tons available annually, this will continue to be a challenge.

The dairy industry in Japan uses about 150,000 tons of perennial ryegrass and tall fescue straw annually. However, the low nutritional value and other feeding problems limits this use.

On-farm composting of the straw is another option being studied. Use of the compost as a soil amendment on the farm, or marketed commercially as a soil conditioner or potting medium, holds some promise.

The industry remains committed to quality seed production. It believes that grass seed production has a beneficial environmental and economic impact on the area. The industry intends to retain the distinction of being the "Grass Seed Capitol of the World."