Oregon State University

Crop Science Report
RESEARCH/EXTENSION

Tall Fescue Production in Oregon

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Tall fescue (*Festuca arundinacea*) is a widely grown forage crop in the United States. It maintains a productive stand for long periods and tolerates a wide range of soil and enviornmental conditions. Established plants form a heavy ground cover and a root system that provides excellent erosion control. Therefore, it is an excellent crop for both forage and conservation uses with a large demand for seed.

Seed production of tall fescue has increased dramatically in recent years. Between 1950 and 1980, tall fescue production in the United States increased from 19.2 to 74.7 million pounds. The harvested area increased from 87,000 to 300,000 acres. In 1980, Oregon produced about 12 percent of the US tall fescue seed from fields that were established primarily for seed production. A major competiting area is Missouri where seed is harvested from large acreages established primarily for pasture production. Selected fields are closed up and held for seed production.

Mid-west production is dictated by market conditions. Fields are grazed and seed is harvested if seed sales will produce sufficient income to pay the harvest costs, while other expenses such as fertilizer and labor are charged to the livestock enterprise. This situation makes it difficult for the specialized seed grower to compete since all his expenses must be paid from seed sales.

PLANT DESCRIPTION

Tall fescue is a very deep rooted, tufted, long-lived perennial grass. It reaches a height of 3 1/2 to 4 feet. It produces numerous dark green leaves. Its most important characteristic is its wide adaptation, growing on soils from very acid to very alkaline. Tall fescue is well adapted to heavy clay and clay-loam soils and will tolerate poor drainage. It has the ability to withstand drought and low fertility but produces forage and seed best under high fertility management situations.

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VARIETIES

Tall fescue as a forage crop received little attention until Oregon and Kentucky simultaneously released two improved varieties - Alta and Kentucky 31 in the early 1940's. Alta is an ecotype selection developed at the Oregon Agricultural Experiment Station, and Kentucky 31 is a natural selection released by the Kentucky Agricultural Experiment Station. Other varieties have been released from breeding programs in California, Oregon and Kentucky. (See Table 1) Recently interspecific crosses with ryegrasses have been made by plant breeders to improve the palatability of tall fescue. Several new varieties from this type of breeding may be released in the near future. In addition, tall fescue has characteristics that have value as a turfgrass in heavy traffic areas. Plant breeders are in the process of releasing several turf-type tall fescue varieties. Therefore, many new varieties of tall fescue for forage and turf can be expected in the near future. Some varieties have been tested at Corvallis for seed yield. (See Table 2)

Table 1. Tall fescue cultivars, origin, areas of most use, and characteristics

Cultivar	Date of release	Origin or source	Area of most use	Relative maturity	Other characteristics
Alta	1940	Oregon station	West, Northwest	medium early	adapted to dry summer conditions
Goar	1946	California station	West, Southwest	early	adapted to alkaline soils
Fawn	1964	Oregon station	central US, Northwest	early	good seedling vigor, improved palatability
Kenhy	1976	Kentucky station and USDA	central US, northern states	medium-late	improved palatability & disease resistance
Ky 31	1942	Kentucky station	Southeast, central US	medium	wide adaptation, good winter growth
Kenmont	1963	Kentucky, Montana stations	Southeast, northern Great Plains	medium	good midseason growth
Kenwell	1965	Kentucky station and USDA	Southeast, central US	late	disease resistance, improved palatability

Table 2. Tall Fescue Seed Yields, Corvallis, Oregon

Variety	Lbs/Acres 1967	1968	1969	Average
Alta	1496	1237	1455	1396
Fawn	1503	1384	1807	1565
Goar	861	699	655	742
K 31	1320	1409	1488	1406
Kenwell	811	1020	625	819

CULTURAL PRACTICES AND MANAGEMENT FOR SEED PRODUCTION

Tall fescue is adapted for seed production on fertile soils that range from moderate to well-drained. Seed production fields should not be established in areas subject to late spring frost. Injury to seed crop of early tall fescue varieties have been noted in Willamette Valley areas from frost at the time the inflorescence emerges from the boot.

1) Planting

Tall fescue seedlings are weak competitors with annual weeds during the first season of growth. Therefore, a clean, weed-free, firm seedbed is essential.

A spring planting will develop during the summer and fall and produce a good seed crop in the following year. Late winter or spring plantings (March through May) are most often used to establish tall fescue for seed production. The planting season can be extended into the late spring or summer if adequate irrigation is available.

A fall planting will not produce a seed crop in the next season unless seeded and irrigated before mid September. Also annual weed control is difficult. If a fall planting is made, the most common procedure is to prepare a good seedbed on land that has grown a cultivated crop or a spring-seeded grain crop. Fall plantings should be made no later than October 1.

Drilling the crop is preferred to broadcast seeding because a more uniform stand results from the control of seeding depth. Seeding rates range from 8 to 10 pounds of seed per acre in 12 to 18 inch wide rows.

Solid stands used for seed production become "sod-bound". This situation is associated with a thickening of the stand as a result of the tall fescue plants spreading by tillers and rhizomes. Stands planted at the lower seed rates do not become sod-bound as quickly as those seeded at heavier rates. Once a stand has become sod-bound, heavy fertilization will produce forage growth but only a limited amount of seed. The practice of shallow plowing or light tillage of an old, sod-bound field will help to renew seed yields, however, experience has shown the sod-bound condition will recur soon and

the practice is not widely used in seed production. The use of 12 to 18 inch row widths accompanied by post harvest burning, heavy fertilizer rates, and an annual herbicide application has been known to maintain seed yields for 8 to 10 years.

2) Weed Control

The most important step in weed control for seed production is the selection of a clean, weed-free field, and the proper seedbed preparation. In situations where grass seed are a particular problem, the use of a chemically prepared field has been used. (A seedbed is prepared in the autumn by tillage. Germinating weeds are controlled using propham or paraquat during the winter. The fescue crop is planted into the seedbed without additional tillage in March.)

Tall fescue may also be established in difficult weed situations using a technique whereby the seed is planted below a protective band of activated charcoal. This technique involves the use of a specially constructed drill and the immediate application of a herbicide for annual grass control. This technique is most often used in turf grass seed production where extremely high seed standards are required. The practice may be too expensive for forage seed crop production except under special situations but may be of value for turf-type tall fescue varieties.

Broadleaf weeds can be controlled in new and established seed fields of tall fescue with 2,4-D; dicamba and 2,4-D in combination; bromoxynil; or MCPA. New seedlings should not be sprayed with 2,4-D, MCPA, or dicamba-2,4-D combinations before the fescue has 5 leaves (usually 4 to 5 weeks after emergence). Label precautions should be carefully followed in all spray operations. (See Oregon Weed Control Handbook for details.)

3) Fertilization of Established Stands

The use of commercial fertilizers is essential for tall fescue seed production. Nitrogen is the most important nutrient effecting seed yield and must be applied annually. Phosphorus and potassium applications are made on the basis of soil test results, usually at planting. Lime should be applied if the soil pH falls below 5.5. Annual nitrogen applications of 50 to 60 pounds per acre are applied to established stands in the autumn with 90 to 100 pounds per acre in late February or March. When tall fescue fields are grazed, a late summer application of nitrogen may be applied to encourage autumn growth for winter grazing.

4) Post Harvest Management for Weed and Disease Control

Effective weed control in older stands is essential to produce seed that meets market standards. The complete removal of crop residues after seed harvest is essential to maximize the effectiveness of chemicals used in annual weed control. Burning straw on seed fields immediately after harvest is the most effective method of removing residue and preparing the soil for herbicide application.

When post harvest burning is not possible, a thorough removal of all straw, stubble, and summer regrowth with a chopper will serve as a method of residue management. The technique is much less effective for weed and disease control than open burning; however, it will reduce losses as compared to no removal of residue. There is no good commercially designed

equipment available for removal of chaff and stubble from seed fields. The forage choppers or stack wagons that incorporate a cutter and vacuum intake have been used with some success.

Annual grass and broadleaf weeds in established stands of tall fescue can be controlled by an autumn application of simazine, propham, chlorpropham, or diuron. Simazine, propham or chlorpropham are especially effective for control of wild oats and ripgut brome. Diuron is more effective in control of annual bluegrass.

Broadleaf weeds in established stands are controlled by spring applications of 2,4-D, 2,4-D plus dicamba, or bromoxynil. These herbicides must not be applied after seed heads appear in the boot. Autumn applications may be needed for weeds that are difficult to control.

CERTIFICATION

Maintaining the genetic identity of a variety is an important part of seed production. Certified seed usually receives a higher price than uncertified. Some varieties cannot be sold by variety name unless they are certified.

Specific requirements for planting stock, land history, isolation and other tolerances for seed production are available through the Oregon Seed Certification Service. Standards require a field inspection shortly after planting and annual inspections at heading time before a seed lot can qualify for certification. Certification standards should be carefully studied before a seed field is planted to assure that it meets all requirements for field history and isolation.

Much of the tall fescue grown in other regions of the United States is a by-product of pastures grown under conditions that do not qualify for certification. Most Oregon tall fescue seed is grown under conditions that can qualify for certification. Buyers seeking areas for certified tall fescue production turn to Oregon growers. Seed producers planning tall fescue seed production should take advantage of the fact that most other regions for tall fescue seed production in the US do not or cannot produce certified seed of new varieties. Thus, Oregon growers have a distinct advantage.

HARVESTING

The seed of tall fescue shatters readily when ripe. Tall fescue is usually windrowed with the seed allowed to cure for 10 to 12 days before harvesting.

The mower or windrower should be set high enough to leave 4 to 6 inches of grass stubble with the windrow placed on top of the stubble. Air will circulate through the swath and increase the drying rate.

Oregon studies have shown that the proper swathing time for maximizing pure live seed is when the seed moisture in the standing crop is 43 percent. Growers tend to swath tall fescue later than this stage, increasing the risk of seed shatter.

The combine should be set according to the manufacturer's instructions. The seed is readily removed from the head, thus excessive cylinder action is unnecessary. Care should be taken to assure that the seed is not being carried through the combine in the straw and chaff, and frequent checks should be made to assure that the minimum seed loss is occurring. The operator should be trained to recognize sterile or immature florescence that may give the impression that seed is being lost.

Seed combined directly from the standing crop will have a high moisture content and will usually require special handling to prevent seed damage resulting from heating. Harvested seed should not be stored in bulk bins at moisture contents above 12 percent as is determined by an oven-drying technique. If drying is necessary to reduce the seed moisture content, the circulating air in the dryer should not exceed 90° F at the flue entrance.

SEED STORAGE

Seed storage life is determined by the initial seed quality, seed moisture, and storage conditions. High seed moisture and high storage temperature conditions are the most damaging to storage life. In a study of seed viability under Oregon conditions, one tall fescue lot that germinated 98 percent at the beginning of the test dropped to 80 percent after 5 years of storage.

MARKETING

Marketing forage grass seed is a specialized operation. Only small amounts of seed are grown in the region of use. Seed of new varieties are frequently grown under certification programs far from the areas of consumption. Seed growers should arrange markets for their crop as part of their initial planning for seed production. Arrangements with firms or buyers that have contacts in consumption areas or communication through brokers are able to handle marketing of seed efficiently.

ECONOMIC RETURN FROM SEED PRODUCTION

Estimated costs for tall fescue seed production in the Willamette Valley in 1979 was $269 per acre or $.39 per pound based on average seed yields. The return per acre will depend upon the price and yield. Varieties vary in their seed production capability. Growers should attempt to obtain yield information on new varieties before establishing a planting.