FORAGE AND TURF SEED PRODUCTION IN OREGON AND THE NORTHWEST

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Specialized seed production as we know it really came into its own in the Northwest in the 1940's, with its beginnings going back to the 1920's and 30's. Before that time, the majority of seeds were produced in the areas where the crops were grown, and much was imported from New Zealand and European countries.

Many specialized seed crops are grown in the western states. Forage and turf grass seed production is located mainly in Oregon and Washington. Clovers and alfalfas are important here also, but the majority of alfalfa is produced in California. Vegetable seed production is mainly in California and Idaho with small acreages in Oregon and Washington. Flower seeds are produced in Oregon with the remainder in Arizona. Tree seeds, particularly conifers, are harvested in the mountain areas of the Northwest.

Several factors have contributed to the concentration of forage and turf seed production in this area. One important factor is the dry summers. Seed can mature, ripen and be harvested without damage by rain and wind. The mild winters, with plenty of rainfall for growth but little winterkilling, also contribute. Together, the dry summers and mild winters result in dependable high yields of high quality seed. The varying soil types are adapted to several types of crops. Although these seed are produced far from the consuming areas, seed can stand the transportation costs better than grain crops.

Changes are continually occurring in the forage seed industry. Some crops, formerly important, are no longer grown. Ladino clover seed was grown primarily in Oregon at one time but is now produced mostly in California. Millions of pounds of hairy and common vetch were once grown but now there is very little. Austrian pea seed production has disappeared. Crimson clover acreage has declined. But as old crops disappear, new crops and varieties are continually being added. Acreages for seed rise and fall depending on demand and the acreage planted for forage. High fertilizer prices and increased use of legumes will almost certainly cause an increased acreage of arrowleaf and other clover seed production to meet the demand for seed. Vegetable seed acreage is on the increase. Production for overseas markets has beomce very important with many varieties in the OECD Program. Only a small amount of this seed is used in the Northwest, therefore, an efficient marketing system is necessary. The southeastern states are primary users of the huge volume of ryegrass and crimson and arrowleaf clover seed. Contract production is increasing as more and more proprietary varieties are developed.

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The Willamette Valley in nortwest Oregon is the major seed producing area of the state. This valley is about 110 miles long and 45 miles wide at the widest. It is bordered by the Cascade Mountains on the East and the Coast Range on the West. The Valley enjoys a Mediterranean type climate with mild, wet winters and warm, dry summers, ideally suited for the production of grass and legume seed. Smaller acreages of seed crops are grown in eastern Oregon.

The major forage and turf seed crops grown in Oregon include annual ryegrass, perennial ryegrass, orchargrass, tall fescue, creeping red fescue, chewings fescue, Kentucky bluegrass, bentgrass, alfalfa, crimson clover and arrowleaf clover. Small acreages of white clover, subclover and other crops are grown. Sugarbeet and vegetable seed are also important.

Over 300 varieties are included in the Oregon Seed Certification Program. Out of this list, 237 varieties are currently being grown and certified in Oregon.

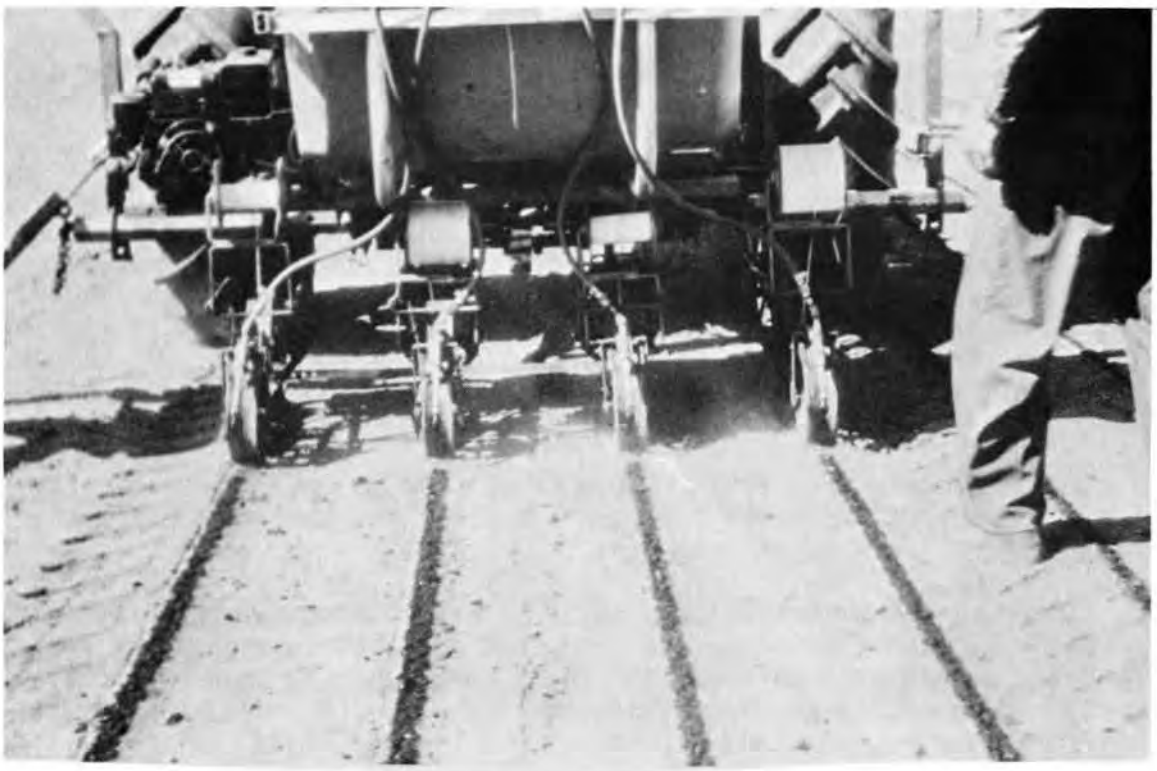
A variety of soil types occur in the Valley. Much of the southern part is poorly drained. Although some other crops can be grown there, the area is best suited for the production of annual and perennial ryegrass seed. The better drained soils are more suited to the production of orchardgrass, fine fescues, bentgrass, and clovers.

Intensive production practices are followed and specialized equipment has been developed for forage and turf seed production. Grass seed fields are normally managed for seed production only, rather than for both seed and forage. This is an important contributing factor to the high seed yields and high seed quality.

Seed fields are planted in rows or drilled. Planting rates for seed fields are much lower than for forage production of the same crop. In the earlier days, rows were wide enough for cultivation to control weeds. With the advent of chemical herbicides, the trend has been toward narrower rows. Production in rows also facilitates the rogueing of weeds, other varieties and off-type plants.

One method of stand establisment is the chemical fallow method. The seedbed is prepared in the fall ready for planting. When fall rains come, the weed seed germinate and grow. The field is sprayed with a herbicide in the winter to control the weed growth. Following this, the crop is seeded in early spring without further disturbing the soil Perennial seed crops planted this way normally do not seed during the first season.

A second method of establishment is the charcoal banding method. The field is planted in the fall and a one-inch band of activated charcoal is applied immediately above the drill row. Following planting, the field is sprayed with a non-selective herbicide. The herbicide controls all of the weeds between the rows and the charcoal protects the newly planted crop seed. The few weeds remaining in the row are controlled by hand rogueing or spot spraying with herbicides. Perennial



Charcoal banding method of stand establishment.

Newly established field following chemical fallow.

ryegrass planted in the fall with charcoal method will set a seed crop the following summer. With both the chemical fallow and charcoal banding methods, grass seed fields frequently meet certification standards for purity the first crop year.

Nitrogen fertilization is the key to high yields of grass seed crops. High rates are applied in split applications in fall and spring, with the spring application also frequently split. Smaller amounts of phosphorus, potash and sulfur are used. Lime is normally not necessary for grass seed production, but successful legume seed production is dependent on lime application on highly acid soils. Swamp buggies with high flotation tires are used to apply fertilizer when fields are wet in the late winter and spring. When fields are too wet for ground rigs, helicopters are sometimes used.

Supplementary irrigation is sometimes used on seed crops, particularly in central and eastern Oregon. Most of the seed areages in the Willamette Valley are not irrigated.

Sheep are commonly pastured on grass seed fields in winter and early spring. They are removed before the culms elongate in the spring and are taken to the hill pastures for the summer. Legume seed crops may be clipped to reduce the amount of vegetative growth and to cause more uniform flowering and seed maturity.

Numerous pests and diseases may cause limited damage to seed crops in any year, but there are a few problems for which control measures must be taken routinely every year. Rust in Kentucky bluegrass is controlled by spraying several times in the summer with a fungicide. Ergot in grass seed and blind seed disease of perennial ryegrass are serious diseases that are controlled through open field burning. There are no known chemical methods for control of these diseases. Silver top, caused by insects, is also kept under control by burning. Billbugs are serious pests of orchargrass and sometimes of Kentucky bluegrass. Control is by timely application of insecticides. Sod webworms may also be destructive pests.

Intensive management practices have been developed for weed control to prevent contaminating weed seed in the harvested crop. Weed control at planting time is the key to successful weed management and perennial crops are sprayed annually thereafter. Isolated weeds that escape blanket applications of herbicide are controlled by spot spraying with soil sterilants. Weeds along fences and roadsides are also eradicated to prevent contamination.

Successful legume seed production is dependent on good managment of pollinator bees. Three kinds of bees are used in Oregon legume seed production -- honey bees, alkali bees, and leaf cutter bees. Although honey bees are used exclusively in other alfalfa seed production areas, they are not the most successful pollinators in eastern Oregon. When alkali bees are introduced several years ago, alfalfa seed yields doubled. Seed yields doubled again following the introduction of leaf cutter bees. Alkali bees are difficult to manage since they must be

Spot spraying for control of weeds and off-type plants in a Kentucky bluegrass field.

Most grass seed crops are windrowed before combining.

maintained in bee beds in the ground. Leaf cutter bees raise their young in cells in holes in bee boards which are placed around seed fields in shelters to protect them from the weather. The cells are constructed from pieces of alfalfa leaves. The eggs and food for the larve are deposited in the cells. Bumble bees are excellent pollinators of many crops but are very difficult to colonize and manage. Only the queen lives over the winter, so new colonies must be established every spring.

Much of the forage and turf seed production is under a seed certification program. This includes those varieties for domestic consumption and those in the OECD Program. Field inspection for contaminating weeds, other varieties and off types is an important factor in maintaining high purity crop seed. Seedling inspections are also made because certain off types are more evident at this stage than when the crop is mature.

Most seed crops other than bentgrass are windrowed before they are combined. Shattering losses can be reduced by harvesting at an early stage and allowing the seed to dry in the windrow. Moisture content can be used as an index of the proper time for windrowing. Timely windrowing greatly influences yields and it must be done during the brief time after the majority of seed are mature but before the seed shatter extensively. Following windrowing, the crop is allowed to dry for a week or more before combining. Rainfall during this period of the year is very rare. Air drying normally reduces the moisture content to safe levels for storage, therefore, artificial drying is not practiced.

Combines with pickup attachments harvest the crop. Many of these are grain combines especially modified for harvesting seed crops. Fleets of five or more combines per field are commonplace.

There are about 325 seed processing plants in the Willamette Valley. Many growers process only their own seed and possibly those of a neighbor or two. Several plants handle over a million pounds of seed annually. Much of the seed is cleaned, bagged, and ready for shipment within a few weeks after harvest. The major pieces of cleaning equipment are the air-screen cleaner, disc separator, indented cylinder and specific gravity separator.

Fields are sanitized after harvest by open field burning. Such burning serves to control diseases, insects, and weed pests as well as removing the straw. In addition, this thermal treatment stimulates tillering for maximum seed yields the following year. Open field burning, although an essential agronomic practice, is being phased out because of objections to the amount of smoke emitted. Alternate methods of sanitizing fields are being investigated to replace open field burning. Several protype mobile filed sanitizers have been developed but are not operational on a commercial scale.

Alternative uses of straw and better straw handling methods are being developed. Increased straw utilization is a necessity because many of the alternatives to open field burning are based on prior straw removal. Various methods of baling, cubing and otherwise densifying straw are

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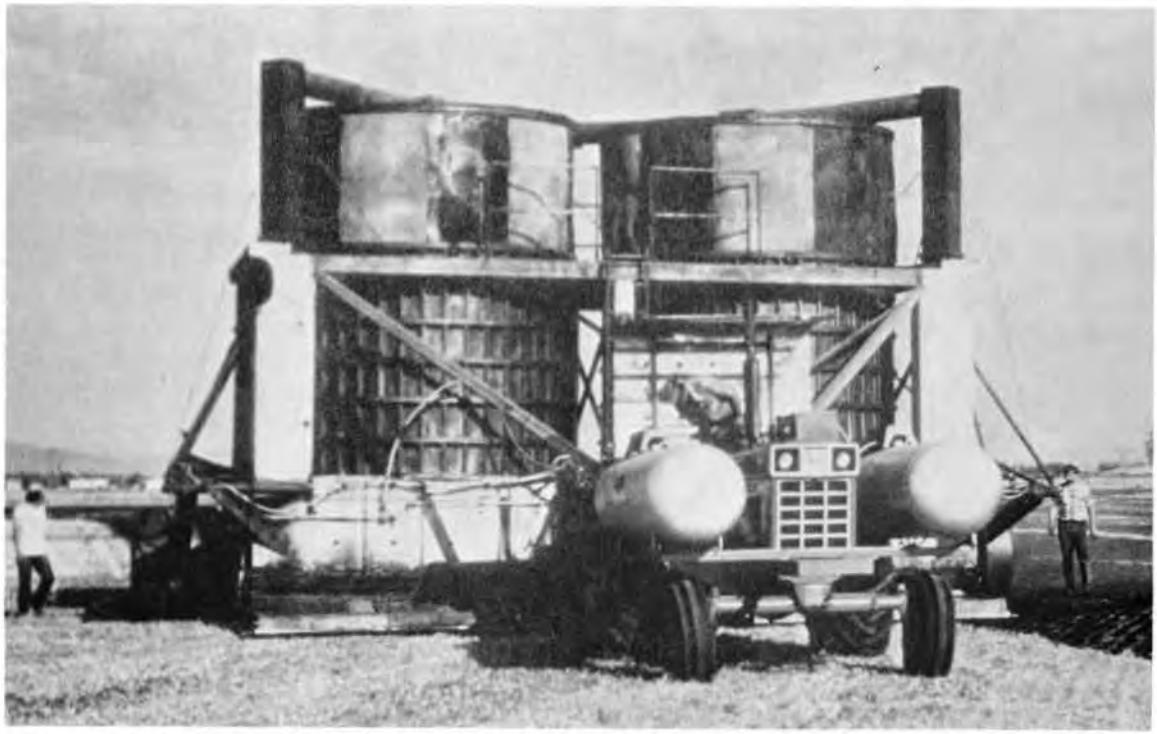

A mobile field sanitizer

being investigated. Development of larger markets for straw is difficult. While it is technically feasible to utilize straw in the plastic, paper and other industries, it is frequently not economically feasible.

After the fall rains start, the perennial crop plants begin regrowth, seedbeds are prepared for new seedlings and a new cycle of seed crop management begins.