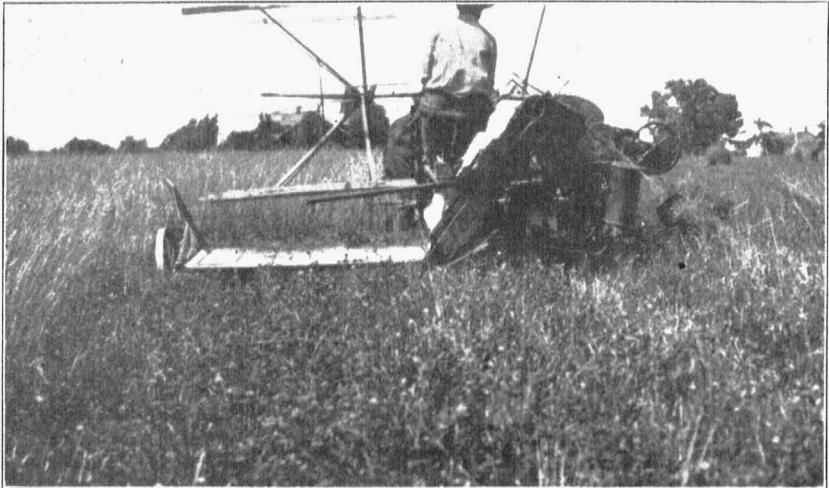


Orchard Grass in Missouri

C. A. HELM



A cash crop of orchard grass seed is harvested by topping the stand, as shown in this picture. The following growth may be pastured or cut for hay.

Orchard grass is the best *grass* for hay and pasture on poor to medium land. It is especially valuable for pasture, meadow, and seed on Ozark soils. It is also well adapted to the prairie soils of Southwest Missouri, the lowlands of Southeast Missouri, and the level prairie and rolling timberlands of North Missouri.

Orchard Grass and Timothy Compared

The value and place of orchard grass in Missouri can be shown by comparing orchard grass with timothy. This comparison will also explain the general use of orchard grass in preference to timothy in South Missouri.

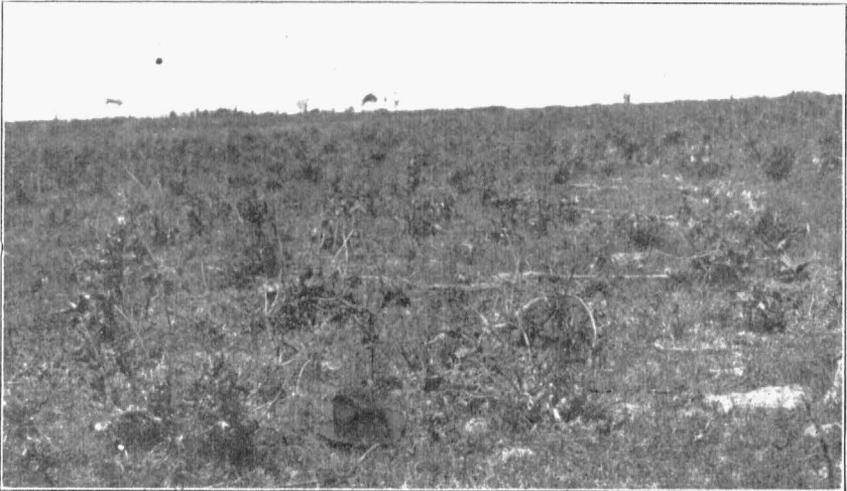
Orchard grass, like timothy, is best adapted to loam soils of moderate to good fertility, but it will grow on poorly drained wet land, and on land that is poor, dry and badly worn. It does well

in moderate shade under conditions where bluegrass and timothy fail to thrive.

Orchard grass will withstand considerably more heat and drought than will timothy. It is hardly as resistant to winter killing, however, and this fact must be kept in mind when the time of seeding is considered.

Timothy makes a fair hay crop, or generally a good seed crop. After it is cut for hay it will produce no seed crop the same year and practically no pasture. On the other hand, orchard grass will produce two hay crops in one season, or a seed crop and a hay crop, followed by considerable fall pasture.

Orchard grass can be grown with red clover in the same way timothy is grown with this legume, and it will mature for hay with the clover. Timothy reaches the hay stage generally ten days to two weeks later than does red clover.



By keeping sprouts under control this type of Ozark land will provide good pastures if sown to orchard grass.

In yield of hay orchard grass and timothy are about equal, but with the additional late summer and fall pasture returns from orchard grass its yield for the season will generally double that of timothy. The feeding value of orchard grass hay or pasture is higher than that of timothy. Orchard grass furnishes pasture much earlier in the spring and continues later in the fall than does timothy.

Orchard grass is a bunch grass and does not equal timothy in forming a sod. However, this advantage can be at least partly overcome by heavy seeding where orchard grass is to be used for pasture. Both crops can be continued permanently from the first seeding by proper handling. Orchard grass, however, is more resistant than timothy to weeds and other tame grasses.

Orchard Grass in Cropping Systems

Orchard grass may be grown as a sod crop in cropping systems in the same way timothy is grown. It may be sown with wheat in the fall or with oats in the spring. Generally fall seeding with wheat is the most satisfactory method. After the wheat or oats crop is removed the orchard grass may be left from one to five years before the ground is again plowed for cultivated crops. By seeding red clover with the orchard grass an excellent mixed hay may be obtained. The red clover will generally disappear after the first season, leaving a pure stand of orchard grass.

Orchard grass reaches its full growth the first season after the nurse crop of wheat or oats is removed. It is one of the first grasses to start growth in the spring. If desired for pasture it may be used during the entire summer and into late fall. When the crop is to be cut for hay or seed, stock should be kept off through the spring and until the hay or seed crop is removed in June.

The removal of a seed crop of orchard grass will not materially affect the quality or yield of the hay crop. Orchard grass for seed is cut high or "topped," and the whole lower part of the plants is left undamaged. As soon as the seed crop bundles are removed from the field, the rest of the crop may be cut for hay. On moist soils a second hay crop may occasionally be obtained, especially during the first two or three seasons after seeding. A seed crop can be produced only once each year and the seed must come from the first crop.

On good soils a red clover seed crop may be obtained the first year after the first crop of orchard grass is removed. This is possible because the orchard grass develops a low, spreading, leafy growth after the first cutting in June. Therefore, an orchard grass seed crop may be removed in June, a hay crop harvested immediately afterwards, and the second growth of red clover cut for seed later in the summer.

On soils low in fertility or lime, where red clover does not grow well, orchard grass and Korean lespedeza provide a good combination. Three to five pounds of lespedeza seed to the acre should be

sown with orchard grass in the spring. This legume will rapidly improve in stand and furnish supplementary legume pasture between July 1 and October. It is especially desirable with orchard grass because after the first season, orchard grass, being a bunch grass, deteriorates in stand, while lespedeza improves in stand from year to year.

Seeding Orchard Grass

The rate of seeding orchard grass varies with the quality of the seed and with the purpose for which the crop is planted. The rate of seeding should be lighter when the crop is grown primarily for seed than when it is sown for general pasture or meadow. Thin seeding results in more thrifty plants and a larger yield of better developed seed. However, orchard grass is so valuable for pasture and meadow that it should rarely be grown for seed only.

A seeding of 6 to 8 pounds to the acre is sufficient for seed production; 10 to 12 pounds should be sown for hay or pasture combined with seed production. These rates are for high quality seed, and should be increased to at least one bushel, or 14 pounds, when poorly cleaned seed is used. The heavier rate of seeding results in several advantages: (1) The chances of securing a good stand are greater, (2) a closer, more compact, and heavier sod avoids much of the bunchy habits so objectionable in orchard grass, (3) weeds and other grasses are controlled much better.

Fall Seeding with Wheat

In the southern fourth of the State orchard grass is best sown in the fall with wheat, seeded at once after the fly-free date. Sowing the grass alone in the fall is not as satisfactory as sowing it with wheat, because of the winter protection given by the wheat. The orchard grass seed is mixed with the seed wheat and sown through the drill. When the seed are mixed evenly they will not separate and will always give an even stand. For best results comparatively small quantities of seed should be thoroughly mixed at a time. If large quantities are mixed at a time, an uneven stand of the orchard grass is likely to result.

Fall Seeding Alone

Tillable ground should be well prepared as for wheat. The seeding should be done late in August or during the first part of September. Orchard grass seed sown alone is very difficult to spread evenly, and uniform stands seldom result. It is best sown by hand during calm weather. More even distribution can be obtained from

seed mixed with moist sawdust. The seed should be covered by a light disking or harrowing.

Spring Seeding

In the central and northern half of the State orchard grass should not be sown in the fall, for it is easily killed by early frost when it is not well established. Except when seeded in rough or newly cleared land for mixed pasture, orchard grass should be spring sown with oats or barley as a nurse crop. Comparatively small returns are obtained when orchard grass is sown in the spring. The young plants when sown alone are also forced to compete with the heavy growth of weeds during the spring months.

The grass seed may be mixed with oats or barley and drilled, or when the barley or oats are broadcast and disked in, the orchard grass is broadcast after the disking, and covered with a harrow. In very dry seasons it is sometimes necessary to cut the grain early for hay in order to save the grass.

Harvesting Orchard Grass for Seed

The seed crop is best harvested with the ordinary grain binder, set to cut the crop with just enough straw to make the bundles. At the proper seed stage the heads are dry enough to shatter easily when struck across the hand, though the stems are still green. If cut too early the seed will be light and of low germination. When the crop is in the right condition for seed harvest much of the best seed may be lost through shattering in the binder. Losses may be avoided by cutting only during the early part of the day while the plants are damp.

Since the crop is usually cut for hay immediately after the seed crop is removed, the seed crop should be put into small shocks to cure rapidly. The crop will reach stacking or threshing condition much more quickly if not more than three to five bundles are used in a shock, with the butts spread well apart to give good air circulation. Shocks built in this manner are easily blown down unless tied at the very top with straw taken from the bundles.

The crop may be either stacked or threshed directly from the field but is generally stacked. The seed will sprout and shatter badly if subjected to continued rainy weather. One week of good drying weather puts the crop in good condition for stacking. An early removal of the seed crop is always necessary if the remainder of the crop is to be cut for hay. The bundles are stacked in round stacks with the butts out by the same method used for wheat or

oats. The grain separator may be adjusted for threshing by using special grass screens and by cutting down the air blast.

The yield ranges from 8 to 25 bushels to the acre, depending upon the soil, the stand, the age of the crop, and the loss from shattering. A bushel of recleaned seed weighs 14 pounds.

Harvesting for Hay

The first cutting always provides the largest yield and the poorest quality. This is due to the fact that the first crop develops the flowering stalks which are comparatively coarse. Much of the coarse part of the crop may be removed with the seed before the hay is cut, leaving practically all the leaves on the land. If the first crop is cut for hay it should be cut just before the plants have reached full heading stage and before blooming.

Under good weather conditions the crop cures rapidly due to the high percentage of leaves. It should not cure too long in the swath, or the hay will be light and brittle. Generally the hay should be put in the windrow the same day that it is cut.

The second crop consists entirely of low spreading leaves. The best quality of hay is obtained from the second cutting, although the yield is usually not more than half that of the first cutting. On old fields, except in very favorable seasons, the second crop is usually too light for a profitable hay crop, and is best utilized for pasture.

THE RELATIVE CARRYING CAPACITY OF ORCHARD GRASS, RED TOP, AND BLUEGRASS ON OZARK UPLAND SOILS, IN PHELPS COUNTY

Days of Cattle Pasture per Acre During the Season

Year	Red top	Kentucky bluegrass	Orchard grass	Orchard grass on partially cleared land
1924	138	56	137	84
1925	37.5	33.7	54.5	59.5
1926	35.7	44.0	52.2	38.5
1927	75.7	84.2	57.7	42.0
1928	33.2	45.5	54.2	48.7
Average	64	52.7	71.1	54.5

Pasturing Orchard Grass

Orchard grass, after the first year, withstands pasturing well. Too severe pasturing, like close pasturing of any crop, permits the growth of weeds, especially whitetop, crab grass, foxtail and red sorrel. Heavy pasturing during the first year will destroy many plants, resulting in a thin, bunchy stand.

The crop comes on very early in the spring, being about equal to sweet clover in early spring growth. It continues comparatively good growth during the dry summer periods, and comes on again rapidly with the cooler weather and late summer rains. An established stand is not affected by light frosts in the fall, continuing its growth until cold weather. If considerable growth is allowed to be frozen down, orchard grass provides good winter pasture, being superior to bluegrass in this respect.

Orchard Grass in Permanent Ozark Pastures

No grass is more valuable than orchard grass for pasture on newly cleared, partly cleared, or worn Ozark land. Orchard grass is especially adapted to cut-over or partly cleared timber land, where there is considerable shade. For permanent pasture orchard grass should be sown with other grasses. A more even sod is thus developed which will keep weeds under control and provide more pasture during the growing season.

For pasture on rough, stony, or cut-over land, where the seed bed cannot be prepared, orchard grass should be broadcast alone or in mixtures in February or early in March. If the ground is matted with a heavy growth of grass and weeds, or bedded heavily with leaves, burning should precede the grass seeding. Where the land is not too rough and is not covered with heavy brush, covering the seed with a brush drag or an A-type harrow is desirable.

The best mixtures and their acre rates are:

For Worn Cultivated Land	For Newly Cleared Land
Orchard grass10 pounds	Orchard grass10 pounds
Redtop 4 pounds	Redtop 4 pounds
Timothy 4 pounds	Kentucky bluegrass 2 pounds
Korean clover 2 pounds	Red clover 4 pounds
	Korean clover 2 pounds

Redtop is a sod-forming grass which becomes well established when used with orchard grass for pasture.

Red clover will usually not succeed on old worn land without a soil treatment of lime and phosphate. On newly cleared land, or on land which has never been under cultivation its growth is very satisfactory and it should be used in all pasture mixtures.

Kentucky bluegrass should be used in all grass mixtures sown on new land. It will supply good pasture, if it is not grazed too close, and if the brush is kept under control.

Common lespedeza (Japan clover) comes into new land without being sown in the mixture. A little seed of Korean lespedeza should be used on old cultivated land to obtain this legume immediately.