... high-class stables,
... purpose, no matter what
... variety of uses to which rye straw
... market for good straw, and often the return
for the straw is greater than the return from the grain. In fact the crop is often grown mainly for the straw.

Enemies.

Rye is subject to no specific insect or fungoid diseases, but pests like the eelworm, the wireworm, and the Hessian fly attack rye in common with other cereals.

Diseases.

Various forms of rust attack rye—a black rust on the stem and a red rust on the leaves are common. Smut may also affect rye. The best-known disease of rye is "ergot" or "spurred rye". Rye containing ergotized grain is extremely dangerous as a food for stock. It may cause abortion in pregnant animals, and also gangrene of the extremities.

Ergot is the dried sclerotium of the fungus *Claviceps purpurea*. The drug is imported chiefly from Spain and Russia. It is sometimes collected by picking from the grain by hand, but is more often separated by sifting.

DREDGE CORN

By W. BORLASE, N.D.A.

The cultivation of dredge corn—a mixture of barley and oats—has until recently been mainly confined to Cornwall. Its more general adoption as an ordinary crop of the rotation was accelerated during the years 1917–8 by the relaxing of the restrictions with regard to its use as food for stock, the feeding of dredge corn to stock having been permitted while neither of its constituents grown alone could be so employed.

In the Annual Agricultural Returns of the Board of Agriculture for Cornwall, one finds all the various cereals named with the acreage of each, but no mention of dredge corn occurs till 1919, although the area devoted to this crop has for some years been greater than that of barley alone in this county. In the returns, dredge corn formerly was entered as barley by most farmers.

The origin of the name "dredge" (often pronounced "dradge") is not very obvious, but its common use applied to corn crops seems to indicate a mixture; thus a farmer speaks of " dredging " his oats or barley with a little wheat, &c., but dredge corn is always understood to be a mixture of oats and barley in varying proportions according to the nature of the soil, aspect. or the use to which it is to be put.

Place in Rotation.—The commonest rotation in Cornwall is a seven-course one as follows: (1) wheat or oats, (2) oats or wheat, (3) roots, (4) barley, (5) seeds, (6) grass, (7) grass. Dredge corn will usually take the place of oats, and very frequently that of barley as well, unless the soil, climate, and situation are very favourable for the production of a high-class sample of the latter, which, in a county with a rainfall of nearly 40 in. and soils deficient in lime, is not often the case.

In some cases the rotation followed is: (1) roots (generally mangels), (2) cereal crop, (3) cereal crop, (4) roots, (5) cereal crop, (6) seeds, (7) grass, (8) grass, (9) grass—the second and fifth years' cereal crops being dredge corn.

In the west of the county many of the dairy farmers dredge all their corn crops, the whole of the grain being consumed on the farm by pigs and cows.

When it forms the first crop after the breaking of the lea, it is usual to add a small proportion of spring wheat to the mixture, and of late years this custom of growing a mixture of the three cereals has become fairly common in some districts.

The proportion of oats to barley is generally two of the former to one of the latter, though this will depend largely on the soil. In many districts when equal quantities of the two cereals are sown, the oat will be the predominant plant, but, after a field has been limed, barley will be much more abundant and of stronger growth than the oat. On some soils this effect of lime on the oat is seen for many years, so that it is necessary to sow a larger proportion of this grain to secure a moderate amount at harvest.

On the other hand, one farmer informed the writer that he had to sow two bushels of barley to one bushel of oats to secure a proportion of two of oats to one of barley at harvest. Probably his soil is very deficient in lime.

Mr. W. Payne, of Lelant, in the west of the county, furnishes some interesting information respecting the custom of his district. He says: " Under ordinary circumstances dredge corn on lea ground (after grass) will consist chiefly of oats; after roots it will be of about the proportion sown with a tendency in favour of the oats, whilst for the last or ' seeding out ' corn crop the barley will be the predominant factor. I prefer white oats with barley for the seeding out crop, especially if a dressing of lime has been applied recently with the object of benefiting the grass seeds, as I find the white oat does not feel the application of lime so quickly as the black oat."

The stronger growth of barley, and its greater abundance in the seeding-out crop, coming after roots is probably due to the reduction of organic matter with its acids through the thorough cultivation and aeration of the soil for three years.

Another farmer from the same part of the county speaks of the advantage gained by sowing a mixture of white and black oats in preference to either alone. A very heavy crop usually results, and the stronger-growing white variety supports the finer-strawed black oat, and the mixture of straw gives a larger amount per acre than the black alone would do.

Time of Sowing.—The crop is usually sown in the first or second week in April according to the season and the locality; in many parts the middle of April is not considered late, but in the colder districts of greater altitude in East Cornwall, the farmer likes to get his seed in and covered by the first week of April.

Seed required per Acre.—The amount of seed sown is generally about $4\frac{1}{2}$ bus. to the acre—3 bus. of oats to $1\frac{1}{2}$ bus. of barley—but frequently it is a little heavier, especially on strong land. The Cornish farmer holds the opinion that thick seeding is necessary on rich land: with a larger number of plants on a given area there is greater competition for the available plant-food. The crop is consequently not so rank and heavy, and is not so easily beaten down by wind and rain.

Manuring.—The manure applied is usually phosphates only, either dissolved bones or superphosphate, but in colder districts 1 cwt. per acre of sulphate of ammonia proves useful in pushing on an early growth, while it is insufficient to delay ripening. Where the dredge corn forms the seeding-out crop, a slow-acting phosphate, as bone meal, is frequently applied for the benefit of the " seeds ", but in too many cases the farmer still allows the manure merchant to decide for him what fertilizers are best, and sows 4 to 5 cwt. per acre of corn manure.

At one time a heap of mixed manure was made (dung, earth, and sea sand), and about twenty loads to the acre ploughed in. The high price of labour has caused this practice to become unpopular, but farmyard manure is still applied by a few farmers for this crop. Their method is open to criticism, for, as the dung is not ploughed in until the spring, the light thin soils are made so loose and open that they dry rapidly, and neither corn nor seeds do well unless the season is a damp one. The use of artificial fertilizers is consequently generally adopted.

BENEFITS FROM GROWING DREDGE CORN

The advantages of dredge corn over either barley or oats alone are fairly numerous and evident. In the first place, a larger amount of grain is produced than would be secured from barley alone, and, very frequently, greater than would be produced from oats alone. Most authorities are agreed on this, and Mr. Payne adds an interesting note: "When we get a dry spell, as we did in 1918, at the end of June or the beginning of July, the 'creased' or tillering stalks of the oat plants die away, the barley gains the mastery and fills up the blank spaces; this was very conspicuous last season when many pure oat crops were thin and light." Farmers are also of the opinion that a better sample of corn is produced by growing the two together, the ripening being more regular. The fact that the oat is rather deeper-rooted than the barley, so that a deeper layer of soil is being drawn upon for food, may account for the larger total of grain being produced, and the heavy seeding prevents over feeding by either of them, and the consequent production of a more uniform and superior sample of straw and grain.

Another advantage is the production of straw of higher feeding value. Barley straw is poor food for stock where the grain is well ripened, and where the oat is grown alone the straw is often very coarse. When grown together the mixture is less coarse, and the crop being cut at an earlier period than barley grown alone, the straw is of higher feeding value and is readily eaten by stock.

A third advantage is the greater probability of the crop withstanding the pressure of wind and rain in the month of July, and doubtless this was one of the chief reasons which led to the introduction of this crop on Cornish farms. It frequently happens that storms of wind and rain prevail in this month, with sometimes a rainfall of over 5 in. for the month, and the corn crops are prostrated. Dredge corn is believed to stand better than either oats or barley grown alone, and this is in itself a sufficient reason for growing it, especially where stock is kept to which the grain may be fed.

The mixture of the two grains is considered by most farmers to make a better balanced food for farm stock generally than either alone, though this is at least questionable. It can hardly be shown that a grain with such a large proportion of indigestible fibre as the oat can be an economical food for the pig, while the oat is certainly a better food for the horse than barley. For young or fattening bullocks, possibly the mixture is superior to either alone. The albuminoid ratios of the digestible portion of each are as follows:

Barley	1:9·5
Oats	1:6·5
Dredge Corn (2 oats to 1 barley) ..	1:7·5

The oat is rather richer than barley in mineral matter or ash and much richer also in fat, the barley being noted for its high percentage of starch.

In the last place it should be pointed out that many Cornish soils are peculiar; on some, barley does not succeed; on others, the oat crop is often a failure. The reason for such want of success is not always apparent, but frequently lime is doubtless the determining factor.

The farmer takes the safer course by sowing the mixture. He does not, in many cases, know the imperfections of his soil, neither can he foretell the nature of the coming season, so that he minimizes risks by sowing the mixture of the two cereals. Looked at from this point of view alone the practice has much to commend it, and its adoption by other counties may be anticipated when its advantages become better known.

Yield per Acre.—The amount of grain produced per acre by dredge corn is usually from 18 to 20 Cornish bushels of 130 to 140 lb. per bushel. Of barley alone, 12 to 14 bus. of 8 score per bushel is considered a very fair crop. The weights of straw will be nearly twice as great with the former as with the latter.

Some farmers are now adding a little wheat to the mixture—the spring variety, April Bearded, being generally selected for this—and the majority of such growers consider this an improvement, the crop standing well and the grain forming a food which is valuable for all varieties of stock. Linseed also has of late been added by a few farmers.