

Cereals

Cereals are strains of grasses that are cultivated and harvested for their grain.

The seven principal cereals grown in the world are wheat, rice, maize, barley, sorghum, oats and rye. Wheat, barley, oats and rye are grown in the UK. Wheat was grown in Britain for many years before the Romans introduced new strains. They brought high quality wheat from the Balkans (Eastern Europe) as well as new methods of cultivation, including a primitive three year rotation. Wheat was very popular because of the bread it made. In Europe rye was very popular for bread-making but in Britain it was grown mainly as a fodder crop. Barley was also introduced from Europe and was commonly grown for its high food value for both animals and humans. Oats have a lower food value than barley but they grow well in the damper climate of the North of England and Scotland. Nowadays wheat offers the highest food value and yield (tonnes/hectare) of grain grown in Britain and is the predominant crop.

Each fully grown plant consists of heads, leaves and stalks. The head, more commonly called the ear, contains the grains that are used for food. The number of grains in an ear differs for each cereal. When harvested the stalk remains as loose straw, some is used as bedding, some as feed. In areas such as East Anglia where there are few livestock and a large yield of cereals, most of the straw is worked back into the soil. The grain harvested from cereals provides about three-quarters of our food energy. About half of our cereals are used as fodder so we consume them indirectly as meat, eggs and milk. The remainder is processed into products such as bread, biscuits, cake, pastry, pizza, breakfast cereals and beer.

The method of growing cereals has changed little, although today it is extensively mechanised and has become much more precise. For many years peasants used an ox and a single plough share, and scattered seed onto roughly cultivated soil. When harvesting there were many people using scythes and flails to reap and thresh the crop. Advances were made during the Agricultural Revolution which speeded up the cultivation process. In the early 18th century Jethro Tull invented both an efficient seed drill and horse hoe. They helped farmers to plant their seed in straight lines and to weed in between them. A hundred years later the first practical reaper was built. The 20th century has seen many technological developments in farming. Today computerised tractors allow ploughing to exact depths, and seed drills which seed a field quickly and precisely, also adding fertiliser. A combine harvester can reap and thresh 20 hectares of cereals in one day, needing only one person to operate it.

Types of Cereal

Wheat forms the staple diet of one third of the world's population. In some parts of the world other cereals play an important role in the diet, eg maize and sorghum in Africa and rice in Asia. Many countries in these areas also grow wheat and other cereals.

Maize - originated from South America, but is now grown everywhere that is hot and sunny enough, ie from Southern Europe southwards. It is one of the three main world cereal crops (the others being wheat and rice). Britain is too cold to grow maize to produce grain, but some is grown as a fodder crop, where the whole plant is harvested while still green and made into silage. However, sweetcorn, a type of maize with sweet grain, can be grown in Southern England. The maize plant is distinctive among cereals in that it is much leafier and the ears (cobs) are carried on the side of the stem at leaf-nodes.

Sorghum - is grown in the same regions as maize.

Rice - only grows well in hot and humid conditions and so it is not grown in the United Kingdom. More than 80% of the world's rice is grown in Asia, in flooded fields called 'paddies'. For many years it has been the Eastern equivalent to wheat and potatoes.

Wheat - is the main crop grown in the UK, usually bringing in more than 13 million tonnes a year. About 1.8 million hectares are cultivated annually producing a yield averaging over 7 tonnes per hectare. Half the wheat produced is used as animal feed, particularly for pigs and poultry. The rest is used in producing food, namely bread, biscuits, cake, flour, pastry, pizza, breakfast cereals and many others. Bread is the main use (over 3 million tonnes a year) and much work has been undertaken in recent years to maximise the amount of UK wheat in UK bread making. In good years it exceeds 85%. Wheat grows well on a wide variety of soils, but is particularly suited to slightly clay soils which provide a firm root hold and are less prone to waterlogging. The main growing areas are in the South and East of England. An ear of wheat contains an average of 54 grains.

Barley - can easily be distinguished from wheat because the ear has long spikes known as 'awns'. When the crop is ripe the ear, containing an average of 30 grains, points towards the ground (necks). The one million hectares of barley grown annually produces a yield of more than 5 tonnes a hectare and a crop approaching 6 million tonnes. Barley is used mainly for malting and as animal feed. It also has a limited use as food for people. Malting is the process where the barley grain is germinated thus producing enzymes which convert its starch reserves to sugars, mainly maltose. The process is temporarily stopped by drying and the malt stored until required. It is used in brewing and distilling, where its maltose is fermented by yeast to produce alcohol. Barley used for malting is low in protein. High protein barley is used as animal feed for pigs and cattle. Barley used for human food is de-husked to get rid of the fibre and sold as pearl barley or crushed as whole grain for breakfast cereal.

Oats - were once commonly grown as feed for ruminants and horses. Since 1950 though the cereal has declined in importance. The decline has come about through its replacement by the higher yielding barley crop which has better animal feed value. Also the rise in mechanisation on the farm and the subsequent replacement of the working horse with the tractor reduced

demand for oats which were the working horse's main feed. Harvesting oats is also difficult as the grain and ear fall off easily if they become overripe. Oats are still grown as animal feed and are still particularly popular in the North of England and Scotland as porridge and oat cakes as well as other cereal foods. Around 100,000 hectares are seeded with oats every year.

Rye - is also a crop that has declined in popularity and today is no longer grown on a substantial level. Previously grown as a poor alternative to wheat, its main function was as a fodder crop. The increased production of barley has reduced its importance. The grain is used in the production of crispbread and in health cereals and the straw is ideal for thatching. It has a low yield of 2-5 tonnes per hectare with only 6,000 hectares being grown.

Triticale - is a new crop, being a cross between rye and wheat. Although a relatively new crop it shows good potential as an all-round cereal. It has a high yield of between 5 and 8 tonnes per hectare, principally used as a high protein animal feed.

Cereals Grown in the UK

Wheat and barley are the most important cereal crops grown in the United Kingdom. Production of oats and rye have declined drastically whilst a new cross of rye and wheat, called triticale, has been introduced. All these cereals are well suited to the UK's temperate climate. The majority of cereals are sown in the autumn (called 'winter cereals' because the young plants have to survive the winter in the open fields) the rest being sown in the spring. Winter cereals give a higher yield because the plants are well established before the spring crop is even sown.

Plant Variations

Crops have been developed in a similar way to animals. Initially, selection was by choosing the largest seeds from a crop and using these as the seed for the following year. This is a simple but haphazard way of improving yields. Today scientists use very complicated methods to improve varieties. The varieties they have produced, combined with a careful use of fertilisers and pesticides, have resulted in crop yields doubling and trebling during the last 50 years. One of the most significant changes has been to produce cereals with shorter stems and more grain. New crops are continually being developed. A good example of this is oilseed rape which, 20 years ago, was a very minor crop but today is one of England's major crops.

Further reading

The Outsider's Guide to Crop Production. 1995. Published by Agricola Training Ltd, Ryelands, Stow, Lincoln LN1 2DE Tel: 01427 788 905. ISBN 0 9525061 5 7

Farm Crops by Graham Boatfield. 1983. £7.96. Published by Farming Press, Miller Freeman Professional Ltd, Wharfedale Road, Ipswich IP1 4LG Tel: 01473 241 122 ISBN 0 85236 129 7

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