About half of the world’s species of edible mushrooms grow in a symbiotic association on the roots of various forest trees. These are the mycorrhizal mushrooms and amongst them are some of the world’s most expensive foods. A few of these mushrooms have well established worldwide markets measured in billions of dollars whilst many others are locally important, for example, biancheto (Tuber borchii), Burgundy truffle (T. uncinatum), desert truffles (Terfezia spp.) and saffron milk cap (Lactarius deliciosus).

All of the mycorrhizal mushrooms are seasonal, best eaten fresh and do not preserve well. Few of the Northern Hemisphere’s commercially important species have made the accidental journey to the Southern Hemisphere. There is, therefore, a golden opportunity to introduce these species and produce the high value foods in New Zealand for out-of-season Northern Hemisphere markets—an idea that was first floated in the mid 1980s and is now the goal of Crop & Food Research’s edible mushroom programme.

One of the best known mycorrhizal mushrooms is the Périgord black truffle (Tuber melanosporum). This mushroom is found in the forests of southern France, northern Italy and north-eastern Spain on the roots of, for example, oaks and hazels. Like all truffles, the Périgord black truffle produces its fruiting bodies under the surface of the soil, and so they are generally located with the aid of a good truffle dog. The fruiting bodies are black, roughly spherical and covered with small diamond-shaped projections, making them look a little like deformed, dark-coloured avocados. These are considered one of the best edible mushrooms and have a place in gastronomy alongside saffron, caviar, foie gras and the finest of wines. The Périgord black truffle is used very widely in gourmet cooking where it either imparts a flavour of its own to a dish or enhances the flavour of other foods it is cooked with. Classic dishes include paté de foie gras, tornedos Rossini and truffle omelette. The last of these can be made by simply placing half a dozen eggs with a small truffle in a plastic bag in the refrigerator overnight. The aroma of the truffle is so powerful that it is able to penetrate through the shell and flavour the egg inside.

Market information

At the turn of the century about 1000-2000 tonnes of the Périgord black truffle were harvested in Europe. Since then the harvest has steadily declined so that now a good harvest yields only 150 tonnes and a poor one perhaps less than 50 tonnes.
Prices vary greatly and in France and Italy truffles can be obtained for as little as NZ$500/kg. However, unless you have a specialist to hand you may be sold other less desirable species such as the Chinese, winter or Burgundy truffle (*Tuber sinensis*, *Tuber brumale* and *T. uncinatum*). Typical in-season prices in Europe are NZ$1000-1500 per kg.

**Cultivation**

The optimum requirements for establishing a Périgord black truffle truffière (truffle plantation, pronounced true-fée-air) are:

- warm summers and cool winters,
- a free draining, high pH (above 7.5 with an optimum of 7.9), well aerated soil with a well defined structure, about 400 mm deep overlying a limestone base, e.g. rendzina and related soils. However, of the eight productive Périgord black truffle truffières outside Europe, seven are on naturally acidic soils (pH 5.9 to 7.0) that have had their pH increased by the application of large quantities of lime,
- irrigation water,
- the absence of other trees that may have competing fungi on their roots.

New Zealand’s first commercial truffière was established in 1987 using specially infected plants raised by Crop & Food Research. Since then more than 70 have been established between the Bay of Islands in the North Island (35°S) and Alexandra in the South Island (45°S).

The first truffles were harvested in 1993 from a truffière on the east coast of New Zealand’s North Island, near Gisborne, five years after planting. In 1997, 1998, 1999 and 2000 this 0.5 hectare plantation produced 9,10,12 and greater than 20 kg of *T. melanosporum* truffles respectively, between May and early September. Grade 1 truffles are currently selling for NZ$3000 per kg and the potential returns in suitable localities are in excess of NZ$100 000 per hectare. Five other truffières also began producing Périgord black truffles during the winter of 2000 in the Bay of Plenty, Taumarunui, Paraparaumu, near Nelson and near Christchurch.

Despite having six truffières producing in New Zealand it is still difficult to predict the ideal location for a Périgord black truffle truffière. However, we believe that the risks of failure are considerably higher:

- in the cooler coastal areas to the south of North Canterbury,
- where there is no irrigation water,
- where there are many trees harbouring competing fungi on the roots,
- in areas with a high rainfall,
- on soils with a natural pH less than 6.0, and
- on poorly drained soils.
An information pack is available free of charge from Ian Hall (see contact details below).

A comprehensive guide to the cultivation of the Périgord black truffle, simply called “The black truffle”, has been prepared by Ian Hall, Gordon Brown and Jim Byars. It is recommended that prospective growers read it before taking the idea further. An alternative is Chapter 3 in the book “Edible and poisonous mushrooms: an introduction” by Ian Hall and colleagues. Both books are out of print but should be available from your local library. We expect to have new editions of both books available in 2002.

Membership of the New Zealand Truffle Association is available to those with a genuine interest in the Association, including growers, intending growers, chefs and marketers, and is not restricted to New Zealanders. Those who would like to join the Association will find an application form in the information pack available from Ian Hall.

Further information

Ecoplanning 1992. Norme pratiche per la coltivazione del tartufo. Ministero dell’agricoltura e delle foreste. [Italian]

At the turn of the 19th century, France and Italy produced 1000 to 2000 tonnes of Périgord black truffles. Since then there has been a catastrophic decline in production. The figure illustrates the change in truffle production in the Quercy region since 1920.

Immature (top) and mature Périgord black truffles.

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