



By Dr Ian Hall

# Growing mushrooms: the commercial reality

SETTING up a little business which might eventually be the major earner is not an uncommon motivator in people approaching me for advice on growing mushrooms. But before you join the throng and walk into the boss' office to give him that rude sign you have been waiting so long to do, it is probably best to first learn a little about the commercial realities of cultivating mushrooms.

The button mushroom, and its close cousins like the Swiss brown, are the easiest to deal with. There is a wealth of information available on the buildings and equipment needed, how to prepare mushroom compost, where to get the best strains of mushroom from, and what pests and diseases are likely to be encountered. Books have been devoted to the subject and websites like Penn State University's Mushroom growers' information site (<http://mushgrowinfo.cas.psu.edu/home.htm>) and magazines like Mushroom Business ([www.mushroombusiness.com](http://www.mushroombusiness.com)), keep those already involved in the industry up to date. However, while it might appear that all the details are available, there is a significant difference between producing a few mushrooms in a pilot trial and the continuous production of a consistent, high quality, high yielding, disease-free product for sale to a discerning public. Hygiene and climate control are crucial to a successful operation while failure to prevent and control pests and diseases can lead to financial ruin.

When it comes to the speciality mushrooms that grow

on wood waste, quarantine restrictions may also need to be considered. For example, the grey oyster mushroom (*Pleurotus ostreatus*) cannot be imported into New Zealand because it could pose a risk to our forest industry. The importation of other mushrooms new to New Zealand might also have to be approved by the Environmental Risk Management Authority. This is often a long, slow and expensive process during

which it is determined if a mushroom has any traits that might make it an unwanted guest. After that there will be the inevitable problems of growing a new mushroom where expertise is not close to hand and a fickle New Zealand public that might shy away from a strange looking mushroom. After that, if it is the plan to also export a mushroom, there is competition from the developing countries who are probably already producing it for perhaps a fraction of the price we might ever be able to produce it in New Zealand.

Changing regulations have also been an issue for button mushroom producers having to take more care during the conversion of straw and manure to mushroom compost which produces some disgusting smells. The mushroom farm in our little village of Oving was the main reason my father cajoled us into escaping England in 1965 for our great New Zealand adventure. The problem then was that mushroom growing was classified as an agricultural operation, even though in reality the mushrooms were being grown in a large factory that polluted the atmosphere and streams; created excessive noise and depressed property values (<http://www.telegraph.co.uk/property/4810630/Your-dream-home-and-what-lurks-inside.html>). The same problems have been encountered around the world since then, although the balance seems to be shifting in



**The grey oyster mushroom is widely cultivated overseas but could harm the radiata pine industry if imported into New Zealand.**

Photographs: Dr Ian Hall



**Above: Enokitake fruiting out of the top of plastic bottles.  
Below: Drying enokitake on racks produces an enjoyable snack food.**

favour of those who have the pollution inflicted on them (e.g. [www.aaron.ca/columns/2001-09-01.htm](http://www.aaron.ca/columns/2001-09-01.htm)). Add to that the huge cost of establishing a mushroom farm, the current trend to compost in closed buildings and burn or oxidise odours with ozone, intense competition within the industry, and issues such as mushroom worker's lung disease (or hypersensitivity pneumonitis), would be enough for most to never consider entering this part of the mushroom industry.

Other saprobic mushrooms (those that grow on dead plant or animal remains) such as enokitake, shiitake and straw mushroom, are also produced in factories. The Tai Mushroom Farm





## COMPACT WORKHORSES

*Ready to Perform!*

The KIOTI compact range offers extensive attachment, loader & transmission options to meet your every lifestyle need.

- TURF CARE
- HORTICULTURE
- AGRICULTURE
- LIFESTYLE BLOCKS



**NEW RELEASE!**  
45hp model - DS4510



**COMPACT RANGE**  
**22-50HP**

[www.powerfarming.co.nz](http://www.powerfarming.co.nz)

**0800 432 336**



## Horticulture

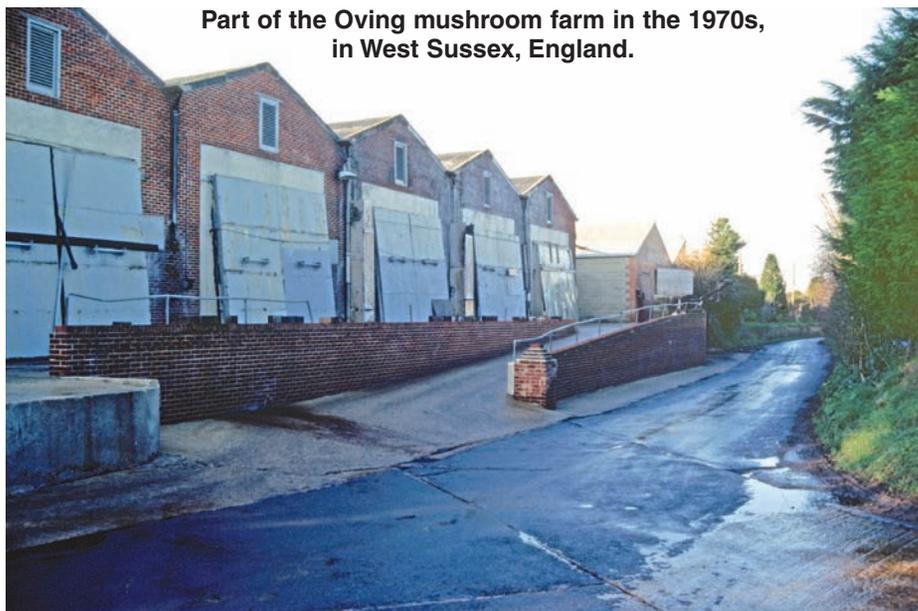


Checking for contamination after enokitake has colonised the growth medium in plastic bottles.

### Growing mushrooms: the commercial reality

in Wufeng, Taiwan, produces several tonnes per week. Like many of the larger scale facilities, most steps are automated, including the production of the medium, filling the plastic bottles the mushrooms are grown in and inoculating the bottles in a sterile environment. Because these types of mushrooms are grown on enriched sawdust or straw, pollution levels are minimal, or at least more acceptable. Unlike the button mushroom, small scale operations are also feasible particularly in developing countries where comparatively simple techniques are often used. More information on this next month.

The true mycorrhizal mushrooms, such as the truffles, saffron milk cap and porcini, only grow on the roots of trees in a mutually beneficial relationship. The



Part of the Oving mushroom farm in the 1970s, in West Sussex, England.



Producing mushroom compost inside a shed can help limit the production of disgusting smells.

easiest ways to sample these delicacies is to forage for them. In fact, for the vast majority of the mycorrhizal mushrooms (about 99 per cent), this is the only way you can get to eat them, because they have never been cultivated. For example, the billion dollar industries based on chanterelles and porcini

are entirely dependent on what can be harvested from the wild. The wild mushroom seller sitting on the roadside in Hunan, China, is another aspect of a huge industry that only recently has begun developing in New Zealand. If you are in Christchurch on an autumn morning and can't sleep, pop over to



## EDIBLE GARDEN

**LARGE SELECTION OF:**  
 Apple, Peach, Pear, Plum  
 Cherry & Apricot Trees.  
 Nut Trees • Vines • Olives  
 Berries & Koanga  
 Heirloom Trees

**Free Catalogue Available**

889 Ashhurst-Bunnythorpe Road, RD 10, Palmerston North 4470  
 Ph: (06) 326 7313 ♦ Fax: (06) 326 7314 ♦ Email: ediblegarden@xtra.co.nz ♦ Web: www.ediblegarden.co.nz

Hagley Park and see if you can see the porcini hunters out with their torches. Others are beginning to harvest the birch bolete and larch bolete which seem to be better flavoured than in the UK, perhaps because they are not as badly affected by insect pests here.

However, as John Fountain and I mentioned in the *New Zealand Lifestyle Farmer* previously, poisoning is an ever-present danger for those who haven't the expertise. So, if you are one of these, please get professional advice before you tuck into a plateful of wild mushrooms.

The few mycorrhizal mushrooms that have been cultivated are grown in plantations of specially infected host trees in areas with the right combination of climate and soil. More on this in a future issue of this magazine. Complete failures are not uncommon. These can sometimes be tracked to fatal management errors but there are other instances where instructions have been followed to the letter – expensive failures accompanied by considerable disappointment.

The other side of the coin has seen some splendid success stories. For example, in the Bay of Plenty and near



**A saffron milk cap glade at Theres and Hannes Krummenacher's property near Nelson.**

Gisborne, Périgord black truffle yields have been spectacular. And it doesn't take a mathematician to determine that more than 100kg of Périgord black truffles per hectare, per year, and selling for an average price of considerably more than \$2000 per kg, produces an awful lot of money.

Similarly, 5kg of saffron milk cap per radiata pine tree, per year, nine years after planting, and selling for an average price of \$35 per kg, is worth

more in that one year than the standing timber is worth after 30 years. More on that too in a future issue.

*Additional information on edible mycorrhizal mushrooms can be found on Truffles and Mushrooms (Consulting) Ltd's website [www.trufflesandmushrooms.co.nz](http://www.trufflesandmushrooms.co.nz) and for more on mycorrhizas try Mark Brundrett's very informative website <http://mycorrhizas.info/index.html>*



**DeLicio®**

Suppliers of quality, DNA tested trees mycorrhized with truffles or other edible mushrooms

Tree sales: Kevin Fearn  
Edible Forest Fungi New Zealand Limited  
P.O. Box 384, Oamaru, New Zealand  
[kevin@oregonnurseries.co.nz](mailto:kevin@oregonnurseries.co.nz)  
+64-3-431 3627, [www.fffz.com](http://www.fffz.com)



Saffron milk cap available on radiata pine and other pines by arrangement

Technical advice: Dr Ian Hall  
Truffles & Mushrooms (Consulting) Limited  
P.O. Box 268, Dunedin 9054, New Zealand  
+64-3-454 3574, [truffle2@ihug.co.nz](mailto:truffle2@ihug.co.nz)  
[www.trufflesandmushrooms.co.nz/page10.html](http://www.trufflesandmushrooms.co.nz/page10.html)



Bianchetto truffle available on hazelnut, stone pine and English oak



Painted bolete only available on Douglas fir