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## A POTENTIAL NEW PROFIT FROM OAK WOODLANDS

by Dr. Mo-Mei Chen

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In California, a variety of mushrooms have become increasingly popular. Because mushrooms grow well in oak woodland habitat, commercial mushroom production offers a profit potential for oak woodland owners. Woodland owners can also sell oak sawdust to mushroom producers.

During the last 30 years, mushroom production has increased twenty-fold. According to Dr. Phillip Miles, professor of biology at the State University of New York in Buffalo, worldwide production of phoenix tall oyster mushrooms (*Pleurotus sajor-*

*caju*) has exploded. The most recent statistics show 909,000 metric tons of production, mostly in mainland China. In the United States, shiitake, oyster and all other species increased 2 percent to annual sales in 1991-92 of \$16.4 million.

Shiitake (black oak mushroom) production has become worldwide, multi-billion dollar industry. During the 1980s, shiitake mushrooms were Japan's number one agricultural crop export. In Asia, it is common for an ordinary meal to contain 30 percent mushrooms. The consumer demand for exotic mushrooms in the United States also promises a diverse and growing mushroom market in the future.

Many mushroom species are sold in specialty shops, supermarkets, and restaurants. For example, the Monterey Market in Berkeley carries over 10 different types of fresh edible fungi produced by local growers. Recent retail prices of mushrooms at Monterey Market were as follows:

| <u>Type</u>    | <u>Price per pound</u> |
|----------------|------------------------|
| Shiitake       | \$5.89 to 11.50        |
| Oyster         | 3.98                   |
| Morel          | 13.00 to 15.00         |
| Matsutake      | 19.00                  |
| Chantrelle     | 13.00 to 15.00         |
| Boleus         | 15.00                  |
| Black truffles | 135.00                 |

Of these seven species, only shiitake and oyster mushrooms are commercially grown. The other five species are wild, and have variable annual yields. These mushrooms are an important food source for wildlife, too.

### **Many Levels of Production Possible**

Mushrooms can be grown by anyone, from backyard gardeners to large-scale corporations. They do not require arable land, special or large amounts of water. Most edible mushrooms prefer hardwood lands. Oaks are preferred over alder and maple for high yield commercial mushroom species.

Mushrooms can be cultivated in hardened sawdust, logs and stumps, and even in the lawn. They can be grown outdoors or indoors. "Just add water" kits or spawn raised under laboratory conditions are available.

### **California Produces Diversity of Mushrooms Year Round**

A variety of mushrooms can be grown from California's coastal range to the Sierra Nevada. With the cool moist winters in Central and Northern California, mushrooms can be grown outside yearlong. They can also be grown indoors in incubation and growing houses. California oak is excellent for growing log mushrooms.

As more Californians become health conscious and interested in the medicinal values of mushrooms and other fungi and herbs, the state also offers unusual social and market benefits. There are 86 edible mushroom species growing in the San Francisco Bay Area, of which 42 have medicinal value.

## Nutritional and Medicinal Value

Besides their diverse and interesting culinary uses, mushrooms have nutritional and medicinal value. Some mushrooms contain cancer-fighting properties and some aid the body's immune system. Shiitake contains vitamins A, B<sub>1</sub>, B<sub>2</sub>, C, D<sub>2</sub>, niacin, phosphorus, iron and other minerals. According to Dr. Kanichi Mori, the shiitake lowers serum cholesterol, has both strong anti-tumor and anti-viral properties, has very low fat, no starch, and more vitamin B<sub>12</sub> than milk and fish. He considers shiitake nutritionally more valuable than the western staples of corn, turnips, potatoes, tomatoes, and carrots. Although they have less protein than meat, the amount is comparable to peas and green beans.

## Edible Mushroom Varieties

The Chinese have cultivated the mushroom for centuries. Of the 300 edible mushroom species, about 30 have been domesticated. More varieties appear every year. Only about 14 species can be commercially grown because of the difficulties in artificial growing. These 14 species are:

|                            |                                 |
|----------------------------|---------------------------------|
| Bottom mushroom            | <i>Agaricus bisporus</i>        |
| Shiitake                   | <i>Lentinus edodes</i>          |
| Common oyster mushroom     | <i>Pleurotus ostreatus</i>      |
| Phoenix tail mushroom      | <i>Pleurotus sajor-caju</i>     |
| Golden top oyster mushroom | <i>Pleurotus citrinopileatu</i> |
| Enoki                      | <i>Flammjlina flutes</i>        |
| Straw mushroom             | <i>Volvariella volvacea</i>     |
| Money head mushroom        | <i>Hericium erinaceus</i>       |
| Wood ear                   | <i>Auricularia auricula</i>     |
| Hair wood ear              | <i>Auricularia polytrich</i>    |
| Silver ear                 | <i>Tremella fuciformis</i>      |
| Ling zhi                   | <i>Ganoderma lucidum</i>        |
| Bamboo mushroom            |                                 |

## Education and Research

Landowners and managers need both experience and education on mushroom ecology and management. Although mushrooms are often thought of as an easy cash crop to produce with a high profit, people often find mushroom cultivation is not as easy as they anticipated. Much of the necessary knowledge must be acquired through practical experience, but understanding the principles of mushroom cultivation demystifies the process, allowing the grower to successfully adapt and develop cultivation methods. Mushroom cultivation demands a level of care and attention to detail much beyond the scope of ordinary gardening and agriculture. The current demand for more information is increasing.

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