Two substrate producers

There is not a lot of rejoicing on the French market for oyster mushrooms at the moment. Consumption and prices are both plummeting. However, two substrate producers in the Limousin and the Auvergne refuse to be beaten.

By Magda Verfaillie, Mycelia

Champi-Creuse

In St. Yrieix-La-Montagne (Limousin), we visited Champi-Creuse, one of the largest remaining oyster mushroom farms in France. Brothers Bruno and Olivier Bianchi founded the company. In more prosperous times, in 1987, they built the first series of 14 poly tunnels to grow mushrooms on substrate purchased elsewhere. At the time producing their own substrate didn't even cross their minds: the prices were high enough, and with a good flush the outlay for the substrate could almost be earned back fully. They were golden days, until imports from the east started to pressurise prices. Now it is chiefly their passion for the craft that keeps them going: production and transport cost continue to rise, and the margins have become so tight that every mishap is a catastrophe.

For this reason, Bruno and Olivier decided to invest in their own substrate production facility. In 2008 they built three new poly tunnels with a substrate preparation installation, large enough to cope with their own needs. One tunnel is used to store the stock of straw, one is wetted straw, and the third tunnel houses a pasteurisation unit and a bagger. In alternate weeks 36 tons and 17 tons of substrate is produced.

Strict hygiene regulations

The substrate is made from chopped wheat straw, enriched with soya and bran. This mixture is wetted to 74% and after a short period of rest in the second tunnel, transferred to the pasteurisation unit. At this stage the substrate has usually undergone a pre-fermentation process, which is not controlled. A maximum of 18 tons fits into the container, pasteurisation takes place at 64°C for 18- 24 hours. The substrate is then removed from the container using a low tech machine which fills each bag with around 15- 17 kilos. The complete workforce of seven is deployed to handle the entire volume during normal working hours. The bags are then stacked up layer for layer on plastic pallets so enough air can circulate around them during the incubation period. A new Italian block press has been ordered, which will double the filing speed using just three employees. We were very impressed by the high levels of hygiene in the pasteurisation and filling sections: it was so clean you could eat off the floor.

Bruno and Olivier Bianchi with Jos Van de Ponseele (SacO2) near the new growing units.

The pasteurisation unit is cleaned meticulously after production.

The blocks incubate for about 15 days, in a second series of new poly tunnels, which are located one kilometre away from the first tunnels so as to avoid any cross infection. The blocks are transported again for fruit setting, to three different sites, at many kilometres distance from each other and the substrate production site. In the nine oldest tunnels walls are built using the bags of substrate, 20 tons per growing room. 14 new tunnels are each filled with 18 tons of substrate, and finally a 1.4 km long, former railway tunnel is utilised to house 200 tons of substrate. Taken as a whole, the three sites represent 300 tons of saleable oyster mushrooms annually. The average yield of the blocks is 22 to 25 % (mushrooms sold per wetted substrate weight) in two flushes, which according to the brothers is the minimum yield to keep the company viable.

The Bianchi brothers view the future with mixed feelings. The consumption of oyster mushrooms in France is showing a downward trend, just like the prices. Diversification could offer a solution, but with the exception of shiitake, there are few lignivorous mushrooms that will grow on pasteurised substrate. Bruno and Olivier are running some cautious trials with shimeji, and in the meantime they are working hard on optimising their oyster mushroom activities.

Incubation shiitake substrate in climate controlled room.

Lentin de la Buche

Bruno Henri started his career at CATE, the experimental station for horticultural crops in Brittany, north west France. From 1989 until 1991 he worked here as a bio-engineer researching shiitake cultivation on pasteurised substrates. Subsequently he considered the time ripe to start his own production company, together with his wife Evelyne.
Two years were wasted on bureaucracy and false promises in another region of France, but finally in 1993 the company opened in the Auvergne, in Monetay-sur-Loire, under the appropriately chosen name "Lentin de la Buche". At around the same time two other substrate producers started in Brittany. Daniel Lester, a former colleague at CATE also started a shiitake substrate production under the name of Bretagne Substrat, while Jean-Claude Thomas specialised in oyster mushroom substrate with Eurosubstrat. There were also a number of smaller players on the substrate market: d'Hardemare and Champi 47 for pleurotus, and Champisyl for shiitake. All these companies worked, or still work, according to the same principle: chopping and wetting the raw materials, followed by bulk pasteurisation in an insulated container, then inoculation and dividing into portions using a block press. This method is used to prepare oyster mushroom substrate all over Europe, and for shiitake mainly in France, Italy and Spain. In the north of Europe producers play safe by sterilising the substrate, and then inoculating the substrate in small portions under a laminar flow. There are fervent supporters and opponents of both methods, but entering into the debate in this forum would be going too far.
Bretagne Substrat ceased trading in 2001, and Champisyl, d'Hardemare and Champi 47 have all also left the arena. Eurosubstrat was given an injection of Italian capital and expanded to include a shiitake production line. Lentin de la Buche flourished, and, not uncoincidentally, invested in a pleurotus substrate production line five years ago. The company currently employs 16 people.

Production to order

In the high season from August to December, Lentin has weekly production of 70 tons of shiitake substrate and 130 tons of pleurotus substrate. In the low season, production is 25% lower. The process is more or less similar for both varieties of mushroom, but individual production is kept well separate in different units. The basis for shiitake is formed by chopped straw, to which oak sawdust and certain additives are mixed. The raw materials are moistened to 72%, and pasteurised at 60°C for 24 hours. The substrate is inoculated with 6.5 % spawn, and the pressed in blocks weighing 12-13 kg wrapped in transparent plastic film. For pleurotus chopped straw is mixed with rapeseed pulp, moistened to 75%, and pasteurised in the same way. After inoculation with 2.5% spawn, the press produces blocks of between 14 and 15 kg. In the space of 6 to 8 hours three people can process 25 tons of substrate into blocks.
The shiitake and oyster mushroom substrates are taken to separate incubation zones, made of sandwich panels and fitted with air conditioning. The total incubation surface covers 3700 m². The oldest unit dating from 1993 is for the shiitake substrate, the newer unit from 2005 is for the oyster mushrooms. The blocks are arranged separately on rolling trolleys, shiitake in the light and oyster mushrooms in the dark. Bruno Henry only produces to order, the blocks are transported as soon as they are ready: after five weeks for shiitake, and after two weeks for oyster mushrooms. They do not sell fresh, inoculated substrate. The company also exports substrate, but on condition that the consignment is not in transit for longer than 48 hours. Approximately a third of the production is destined in this way to countries including Belgium, Switzerland, Czech Republic and the United Kingdom.
The customers have a say in the spawn varieties. The most widely used shiitake strain is 4012 from Somycel, and for oyster mushrooms the classic pleurotus ostreatus hybrids are the most popular. There is also some demand for pleurotus ostreatus var. Florida, for the cultivation of "mini pleurotus" and in summer some growers switch to using pleurotus pulmonarius. Lentin also produces limited quantities of blocks for yellow and pink oyster mushrooms, for agrocybe aegerita (pioppino mushroom) and recently even for hypsizygus tessulatus (shimeji). Spawn from Mycelia is used exclusively for these last mentioned two, as its aggressive colonisation of the raw materials increases the chance of success. The shiitake blocks supply 15 to 20 % of mushrooms in a four month cropping cycle. Yields are 20-25% in two flushes for oyster mushrooms, of which 15 to 18% in the first flush..

Filling and inoculation line for shiitake substrate.