



## Mushroom Farm Visits

Science teaches us many things, both theoretical and applied. However, those involved in the application of science often find creative ways to apply scientific knowledge. Sometimes, what is practical in a laboratory is totally impractical on a farm and farm practices can not be scaled down for the laboratory. Scientists and growers both benefit from seeing how the other works.

CNFA, a contractor for USAID of the US Department of State, sent me to Belarus (Eastern Europe, formerly Belorussian Soviet Socialistic Republic) to consult with Kodik, a *Pleurotus* grower. They had two interesting innovations. They pasteurized their substrate in a feed mixer, which was surplus from a failed state farm. The second innovation was a group of racks that held polyethylene tubes of substrate, laid horizontally, on top of each other, to more than 1-1/2 m high, with both sides of the stack available for picking. Stacking in this manner, allows more surface for picking than hung bags, and provides almost as good

ventilation. Tubes, are little different than bags, but allow more control over size.

One good thing about Kodik's operation is of little educational value to mushroom growers, but it is a benefit to the entire world. Their growing facilities are a former USSR intercontinental ballistic missile base. Belarus is now more a threat to its own people, but as Belorussia SSR Kodik's buildings contained threats to the entire world.

Another USAID contractor, ACIDI/VOCA, sent me to Russia, the grower, Sergei Gusev, also grows *Pleurotus* and had developed a more sophisticated pasteurizing machine. He used two, surplus feed mixers. Hot water was added to the substrate in the first. The second was used for cooling and spawning. Feed mixers must deliver the feed, so screw conveyors are a part of the mechanism. Gusev used one to transfer the hot substrate to the second mixer. The other was used to fill polyethylene tubes with the spawned substrate. With his machine, no one touches anything after the dry substrate is added.

Gusev's machine saves most of the labor associated with pasteurization, spawning, and filling. The savings would be considerable in



Kodik pasteurizer.



Stacked tubes with 4th flush pins.



Gusev pasteurizer. Dry substrate enters upper right. Spawned substrate bagged at bottom left.

Gusev production



many countries, but readers may be surprised to learn that Russia and most of the former Soviets are “third-world” countries. Many people are unemployed, others receive about the equivalent of USD \$50 per month. It is often very cold, -40 C is common, so they must have warm clothing, and houses must be heated. Since they have greater demands on their income, USD \$50 is much less than the same amount in the tropics.

I saw no *Trichoderma* and no flies at either the Kodik or the Gusev facilities. It was February with plenty of snow when I visited Gusev, so flies could not arrive from the surroundings and his conditions were so clean in other respects that the lack of problems was not surprising. However, when I visited Kodik, it was prime season for wild mushrooms and we found many wild mushrooms around and between his buildings. We did see maggots in those mushrooms. Kodik’s pasteurization facilities were about 3 km from their spawn run and growing facilities, that may help explain their lack of problems.

More information on oyster mushrooms is available at [www.oystermushrooms.com](http://www.oystermushrooms.com). There is a small book in both English and Russian on cultivation and handling of oyster mushrooms. There is also information on quality and a number of recipes for your dinner table. I tried to incorporate what I have learned from research and from others.

I went to Turkey to visit Dr. Necla Caglarirmak and to learn a little about their outstanding archaeology and modern culture. The first two weeks were spent touring western Turkey with Elderhostel, a low-cost educational organization. The remaining time was with Dr. Caglarirmak. I began learning about Turkish

food at our first dinner, but Dr. Caglarirmak and her family taught me much more.

Turkey was relatively late to begin mushroom cultivation, but they have a great interest in mushrooms. Upon arriving in Ankara, I was immediately struck by concrete mushrooms that lined many streets. Later I would see them in most Turkish cities. They are used in the same way that cities in other countries use simple posts to control parking.

PE-MA Kultur Mantari, the third largest mushroom grower in Turkey is located between Izmir and Manisa. They grow *Agaricus* and *Pleurotus*, but only *Agaricus* was being grown when we visited. Orhan Pembe and his wife, who manage the plant, showed us around and we discussed the business with them. The operation is modern with tunnel composting and bags on steel shelves. Composting begins with wetting and the first turn is done on the wharf. After it is mixed and aerated it is put into a tunnel for the remaining Phase I and II. Their casing was a heavy soil that seemed to have poor water holding capacity and poor gas porosity. We did not discuss their yield, but visual observation suggested that the yields were only moderate for such a modern facility.

**-R. H. Kurtzman, Jr.**

PE-MA tunnel



Second flush

