

MUSHROOM GROWING HYGIENE

By Frank Parker, Nutrigain Ltd

Over the years great strides have been made to produce composts that are consistently free of mushroom pathogens:- Trichoderma etc. This has been achieved by incremental improvements in Peak heat and conditioning technology. Combinations of temperature, airflow and ammonia gas can destroy all mould spores within the compost prior to spawning.

Unfortunately this is not the end of the story. Every puff of wind or puddle in the yard is a possible source of primary infection. Once a crop or part of a crop is infected it becomes a time bomb for the rest of the farm. Billions of spores produced are deposited on the clothing and footwear of farm staff, very often even before the outbreak is noticed. Swift action to cook out or saturation disinfection is essential. One outbreak of disease can coat thousands of square feet of floors and walls and roofs (inside and out). The microscopic nature of the spores means that they can also penetrate into porous surfaces such as wood, concrete floors and block work.

Swift disinfection of all possible contaminated surfaces is essential. At this point when so much of the farm is awash with disinfectant there may be a considerable hazard for the work force. It is worth considering ways to reduce these exposure hazards.

Over the last hundred years many highly effective bactericides and fungicides have been synthesized by the chemical industries. These chemicals include Phenols, Chlorophenols, Formaldehyde, Glutaraldehyde and various chlorine compounds. The down side to all these very effective chemicals is that their extreme toxicity to mould spores also applies to their effect on the farm work force. A second and very important aspect of these synthetic chemicals is the vapour smell which prevents use in growing or packing rooms. For instance if the products were used on a contaminated growing room floor the crop would absorb the vapour and be unusable. The strong smell and extreme toxicity of the synthetic fungicides means that after application (shelves, walls, floors etc)

the product must be thoroughly washed away. At this point we have a clean surface but with no residual protection.

An alternative product for farm cleaning and hygiene is Sporekill. This product works in a completely different way than the synthetic fungicides. It is manufactured from non poisonous natural products. In the natural world battles have raged for millions of years between green plants and trees and fungal mould spores and mycelium. The green plants produce protective substances against the moulds and invariably destroy the invaders. The Sporekill solution has some interesting properties for the grower. First, it is non toxic and highly surface active (penetrating and detergency) to assist these cleaning effects it has an initial high PH this softens and swells spore walls, mycelium and debris. At this point the active ingredients are fungistatic. As the product dries on the vulnerable surfaces (shelves, boxes, floors etc) it penetrates and fills microscopic cracks in the surface and forms an anti fungal film on the top. During the drying process the PH of the film is lowered by carbon dioxide in the air (and further lowered by CO₂ from mushroom metabolism). This lowering of the PH changes the nature of the film from fungistatic to fungicidal.

The non toxic nature and virtually no smell make the product very useful for maintaining sterile conditions as the crop is still growing. Floors, walls, and picking gear may be washed down during cropping with no adverse effects. The grower will recall that the big advantage with Sporekill is that it has no unsafe residues therefore does not have to be washed off surfaces after use. It therefore retains considerable anti-spore activity on treated surfaces for some time after its application.

Evaluating the effectiveness of different anti fungals is a subject of considerable controversy. Standard laboratory evaluation is of little relevance to the real world problems of the grower. Laboratory tests consist of suspending spores and mycelium in differing concentrations of disinfectant and for different times. This is only a test for instant toxicity in solution and does not mirror what happens in the growing room. Sporekill for example is designed to become effective as it dries over many hours after its application.

To put things into perspective with synthetic disinfectants, the time for wash down (and effectiveness) in a growing cycle is perhaps only thirty minutes in the whole 5 week cycle. The remainder of the five weeks leaves the growing room unprotected because synthetics must be washed away. Growers need to consider strategies that prolong this protective action against pathogens and this may involve using more than one disinfection routine and product.

A table of Properties

SPOREKILL

Up to 51,500 x less toxic

Best remaining on surface

May be used during cropping

Lasts for a whole cycle

Non toxic for workforce

No toxic vapour

Residual build up over time

SYNTHETICS

Up to 51,500 x more toxic

Must be washed off

May not be used during cropping

Gone after rinsing

Potential hazard for workforce

Must be washed away

Washed away