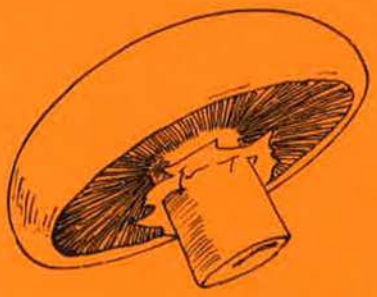
May 1978 Number 65

The Mushroom Journal



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THE OFFICIAL JOURNAL OF THE MUSHROOM GROWERS' ASSOCIATION OF GREAT BRITAIN AND NORTHERN IRELAND

Confidential to members Price £1.50

FOR BETTER COMPOSTS

AND

`ABUNDANCE´

The Mushroom Journal

MAY 1978 No. 65

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In the Editor's opinion . . .

Organised Marketing at last

The news contained in the last issue of *The Journal*, that a group of six influential growers had got together and formed a marketing intelligence group with headquarters at Stamford, will no doubt be received by growers large and small with open arms, the more so as, initially anyway, it is designed to even out supplies to the wholesale markets where the price obtained influences the financial return from all other sales outlets.

For many years now market salesmen have complained that overnight and without due warning, they have from time to time been expected to dispose of hundreds of baskets of mushrooms without any prior warning. Even smaller markets like Leicester, for instance, were suddenly deluged with an unwanted and massive supply of mushrooms some of which, an additional journey and additional damage not withstanding, had to be hastily shipped to other markets.

The lot of the salesman, in such a situation, commanded a great deal of sympathy, especially when the sender of the unwanted mushrooms was in fact a regular sender. Faced as he was with taking a commercial decision he disposed of the over-supply as best he could, anxious at all times to retain the goodwill of the sender. It was frequently suggested, and without any real proof let it be said, that in the end the salesman was forced into the need to even out the mushroom price from all his senders. Certainly faced with a similar situation most of us would adopt that course.

In this matter of over-supply which from time to time has led to the trundling of barrows into, say, Covent Garden market around midday, the Barrow Boys provided a useful service in clearing up the surplus mushrooms. Maybe they too will be a little less needed.

Growers in general should not run away with the idea from now on all will be well on the wholesale markets but they should at least be comforted by the knowledge that, if all goes well, there should be a noticeable improvement in the distribution of at times large supplies of mushrooms to some thirty-five major markets in the United Kingdom — and that means all of the important and influential ones.

Late in the day though this marketing step has come, it is nevertheless a splendid move forward and one which will be broadly welcomed. By evenning out supplies and thus endeavouring to place large consignments of mushrooms where they are most needed and likely to make the most money, the growers concerned are not only helping themselves but are helping other growers as well. Mushrooms have to be cleared from the beds, and even when the criticism over marketing was at its highest, one sympathised with the large producer and his problem. Maybe he too will now have less headaches, even though the obvious aspirin lay so long neglected. WRA

One of the World's Most Outstanding Mushroom Farms

Shackleford Mushrooms employs twenty-eight people, including part-timers, and produces 900,000 lb. of mushrooms annually from a production area of 22,260 sq. ft.

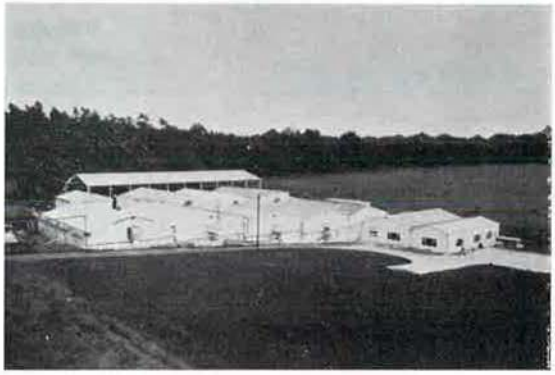
Without question, Shackleford Mushrooms Limited, of Godalming, Surrey, run by Peter Stanley-Evans (MGA Chairman in 1960–61 and current MGA Honorary Treasurer) and his son, David, the current Chairman of the Association, together with Peter Davies and Roger Bunnett who are also working directors, is one of the world's most outstanding mushroom farms, producing just over 900,000 lb. of mushrooms annually from just six production houses of 3,710 sq. ft. of beds. In addition, there are three additional such houses in the preparation area, one each for peak-heating, spawn-running and case-running. Thus the total production area is only 33,390 sq. ft.

Founded after the Second World War as a mixed nursery — it dealt with as many as twenty-six different crops at one time — it was in the mid 1960s that the decision was taken to specialize in mushrooms.

Says Peter Stanley-Evans: 'At the time David, my son, had spent three years working on the best farms in the British mushroom industry, learned as much as he could, and, with the nursery then struggling somewhat, we decided to specialize. We never had any ambition to be the largest mushroom farm in the country but we did set out to be top in the matter of efficiency. Since then we have not increased our bed area devoted to mushroom production, but in fact our actual production of mushrooms has increased four to five times from the same area.'

From Racks to Boxes

For many years this farm specialized in a single-zone, rack system of growing, but changed over to boxes or trays 6 ft. 6 in. × 4 ft. × 8 in. deep. Says David: 'We specialized and embarked on a trail of seeing just how much actual compost we could fill into a sq. ft. of bed area — it is currently 48 lb. The type of measurement which bears the closest relationship to profitability with us is lb. per sq. ft.



An aerial view of the farm

This is because our costs per sq. ft. are closely related to that of other farms, but the difference is that on an 11-week cropping cycle we manage to average over 9 lb. of mushrooms per sq. ft. of bed space (580 lb. per ton at spawning) as opposed to a national average of around 3 lb. 'The main reason for changing to boxes from racks was the flexibility of that system, which enabled us to continually improve on our system of growing. Even now, with a great deal of work being done on shelf production, to us the inflexibility of this system rules it out.'

Debt to MGA Members

At this point Peter intervened to acknowledge the great help given by fellow MGA Members. He said: 'Our MGA friends, both at home and abroad, gave us quite fantastic help. Our fellow growers were prepared to give us unlimited time when discussing the best production system to adopt, not to mention all their advice on cultural matters!'

The Next Ten Years — a Prediction

Says Peter: 'Although I am now of the older generation, I am surrounded by young and enthusiastic directors who have an immense amount of enthusiasm for the job. I am confident that, as far as mushroom production is concerned, we have only just scratched the surface. Over the next ten years the scope for improvement is far and away greater than that which we have achieved over the last ten years.

However, I have always had an enormous respect for the mushroom, and the way in which, if you relax you concentration, things can go terribly wrong.' David joined in to say that he too was very excited about the future, particularly the cultural side of the operation. With regard to farm mechanization, he felt there were some exciting prospects, particularly in the field of climate control. On the cultural side, whilst more people would be quite happy with 9 lb. per sq. ft., 'we are far from happy or content. There is plenty of room for improvement on this 9 lb. figure, and the prospects are quite mind-boggling', he said.

Manure Collection

Perhaps it will be a surprise to some that this farm collects all its own manure, by tractor and trailer, from the many and varied stables which abound in Surrey; most of the manure is loaded by those stables. The collection is restricted to a radius of 15 miles from the farm. There is thus no involvement in any long-distance manure haulage by lorry, and this enabled Shackleford Mushrooms, over the last year, to keep its cost of all raw materials making up the compost to *only 0.3% of the farm's turnover.* This figure includes collection but not, of course, the subsequent cost of turning and processing.

Compost Process

It is Shackleford's contention that the homogeneous condition of the compost at filling is of such paramount importance that a system has been devised whereby they achieve a better Phase I with their non-automatic equipment than they feel is possible with automatic machines. It is a fact that the non-automatic equipment probably costs more than the automatic equivalent, but it is felt that the quality of the finished compost fully justifies the expense involved.

When the manure arrives it is spread in layers over the 250 sq. yd. open pre-wetting area, and

Peter Stanley-Evans (*right*) and son David, getting a good sniff at peak-heated compost

Tractor, trailer and special loading equipment sets out to collect manure

anything from six thousand to twenty thousand gallons of water are added to the 70 tons of original manure — depending of course on the individual needs of the manure and the varying times of the year. A rain gauge makes sure that even water from this source is carefully measured. All the 'goody' water is returned to the pile — a contentious issue, this. Every manure load, as it arrives, is carefully layered over the whole area and the final pile is thus made up of innumerable layers of different types of manure. It is a system which does allow the farm to buy its manure as and when it becomes available and the variability of the supply — light, heavy or what have you — causes no particular problem simply because, in the end, it is all so thoroughly mixed. To ensure a thorough mix — in the original open stacking area — hand forks are still used in the spreading and layering.

The manure in the pre-wetting area can be there anything from a week to ten days. Only on rare occasions, when the manure is very heavy, is straw added. Battery chicken manure, at the rate of four to eight tons per 70 tons of manure, is added, as is gypsum. Currently, further experiments are going on with cotton-seed.

Stacking, under cover now, is by Volvo Loader and three separate stacks are built. The composter, a converted muck-spreader by Tamplin to Shackleford's own design, is self-propelled and is fed by the loader. The loader tackles all three compost stacks at once, taking one jib full from each, tipping it into the composter which, one at a time, builds up three stacks ready for the next turn. Having taken 10–13 days to pre-wet, the most used cycle is Turning Days 0, 3 and 5, Filling on Day 7, although this is often varied depending on the needs of the compost. This and all other cultural decisions are taken by the three cultural directors, Peter, David and Peter Davies. As they themselves say: 'We virtually have a board meeting on every stage of the cultural operations.'

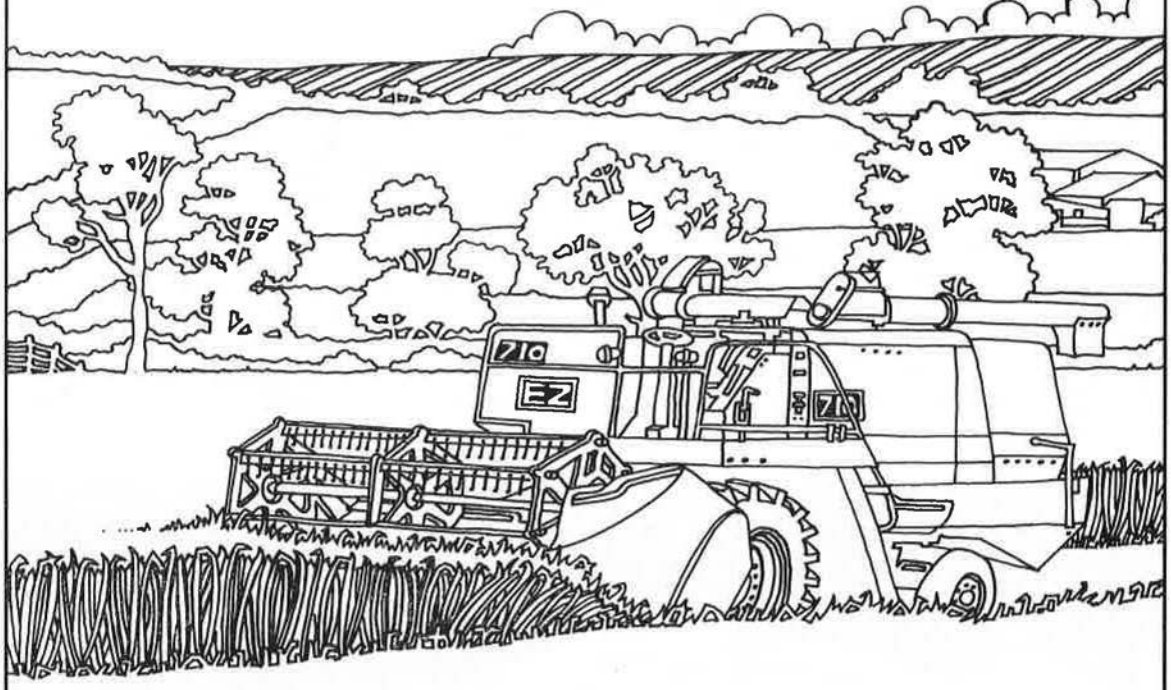
The whole of the composting process is based on the needs of the individual compost, and the system is devised to get as much dry matter as possible into each cubic yard. The final product is very dense and very wet. Surprisingly, sometimes some of the light manure used is up to three years old, and this is incorporated at the ratio of one old light into three fresh, and such mixtures have given the farm some of its best yields.

There is no rigidity in the compost turning cycle, and indeed at the time of my visit, two crops were going through on compost which had been given only two turns — three is the average. In summer, four turns are common.

The original 70 tons of manure — $1\frac{1}{2}$ tons of gypsum is added — is increased to 80 tons at

Layered manure prior to compost turning

Summer is coming - time for K strains



Hot sunny days, sultry, still nights - wonderful times for the beaches, picnics and barbecues - but terrible weather for the mushroom grower.

Horst K26 and K32 strains from Darmycel can take some of the worry out of summer growing. They are both virus resistant and give a complete virus break to reduce the risk of contamination and are less sensitive to high temperatures. K strains will give four flushes in a six week cropping period and large productivity can be obtained.

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filling, when the boxes, with only a very light firming, carry compost 24 inches deep and with 48 lb. to the sq. ft. Seven men handle the boxes at a rate of 50 per hour, but, with a new filling line now ready for use, the number of men will be cut to four.

Peak-Heating, Spawning, Case-Running

Peak-heating follows more orthodox lines, with air temperature held at 140°F. (60°C.) for four hours at the start of the process, and then between 90° and 105°F. (32.2–40.6°C.) maintain a compost temperature as near 135°F. (57°C. approx.) as possible, the peak-heat room taking 3,710 sq. ft. of boxes. The room's total volume is 32,000 cu. ft. giving an air-to-bed ratio on that basis of four to one, or measured in area of flat bed to cu. ft. of air, the ratio is eight to one. Average total peak-heat time is 12 days, but this again depends on the individual needs of the compost, in its 2 ft.-thick beds. On occasions, the peak-heat is not finished by the time the room is required for a new batch, and when that occurs the boxes are moved over to the spawn-running rooms and the peak-heat completed there.

A great deal of heat and cooling is available — the heat can be dry air or live steam, depending on the compost — and importance is placed on putting in the right amount of air: 1.6 cu. ft. of air per sq. ft. of bed per minute appears to give the best results. To a degree, Shackleford can change the nature of the compost during peak-heat, with the dry air, live steam or a mixture of both. It is felt that this is an area where, with accurate adjustment of fresh air to control oxygen level, there is room for improvement. Experiments are going on with nitrogen levels and their relationship with oxygen levels in the peak-heat.

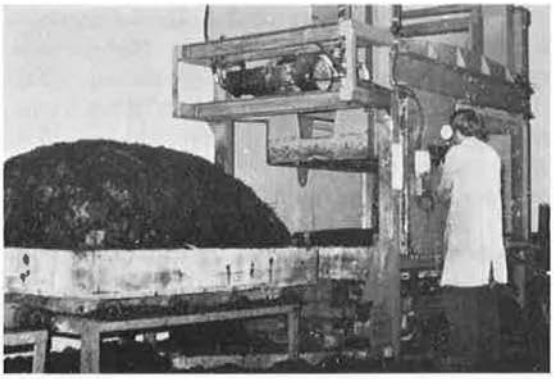
Twenty tons of cooling are available for the peak-heat, and in line with the farm's intense attention to detail the temperature of eight boxes is taken six times every day. Modulating controls have certainly improved efficiency.

Spawning is at the rate of 1½ oz. per sq. ft. of bed. By this time the original 80 ton weight of

Composting in progress

compost has been reduced to 60 tons. A press applies 50 ton pressure on each tray, and this matter of pressure and increased weight of compost per sq. ft. is another area where, it is felt, great improvement in yield is possible. To this end, yet another new machine, capable of chopping manure very finely, with speeds of anything from 800 to 5,000 r.p.m. on the spinners, is ready for trials. The main aim is to get more compost in a given area, and to avoid 'spring back'.

This, says David, is a matter of evolution and not revolution, but great care will have to be taken with any advance in this area. The combination of chopping and pressing harder could mean that the present production boxes, although still with only 12 inches of compost, could take double the present amount. Even he admits that this change, if eventually successful, could take up to eight years to realize its full potential.



This gives some idea of the enormous amount of compost per tray, about to be pressed at 48 lb. per sq. ft.

Casing is with a mixture of peat and chalk in equal parts by volume, but in order to have chalk of the right texture itself, two grades are bought and mixed together to give a final mix of two-thirds dust to one-third three-eighths clean — yet more evidence of attention to detail. Casing takes place three to five days after spawning and later the casing is 'levelled' a second time. Casing is done early because there is a need to reduce first flush yields to around 2 lb. and to ensure more even flushing throughout the crop.

The casing material is sterilized with methyl bromide as, in between crops, is all machinery involved in spawning, casing and so on.

Casing

The application of the casing material to the farm's deep curved beds is a problem yet to be overcome satisfactorily, in spite of the use of 'casing rings' to control evenness. Experiments were tried with deep, flat beds in 12-inch boxes, but these caused very real problems with the women pickers, who found the curved beds much easier to deal with and much less painful. So much was this a problem that picking speeds fell quite dramatically. It is felt, too, that the problem of curved beds and CO_2 drainage could be significant.

'Casting over' when the mycelium appears is carried out as many as four times and the evenness of cropping outweighs the additional labour cost. The theory behind this is that the mycelium is, in fact, growing through the casing at the same rate, and by the time it gets through the deepest casing, all the rest of the bed has been 'cast over'. This has only been possible by the close control of CO_2 levels to 0.15 to 2% in the case-running rooms and therefore, when the mycelium comes to the surface, it does not initiate. In the old days, without recirculated cooling, when the mycelium surfaced it started to initiate, but today on this farm initiation starts on the actual day required.

It is when initiation is completed that the growing boxes are moved from the case-running room to the production units, a job which takes around two hours. During moving time all the exhaust fans in the cropping houses are turned

Shackleford's Engineering Director, Roger Bunnett

off. Usually the move over to the cropping houses takes place on Wednesdays, and with the farm's initiation system, picking is expected to start the following Monday, with the second flush a week later.

So to the actual production rooms, where the crop is so advanced that after five days picking starts. Picking, for very sound economic reasons which will be explained later, occupies eleven weeks.

Under Two Roofs

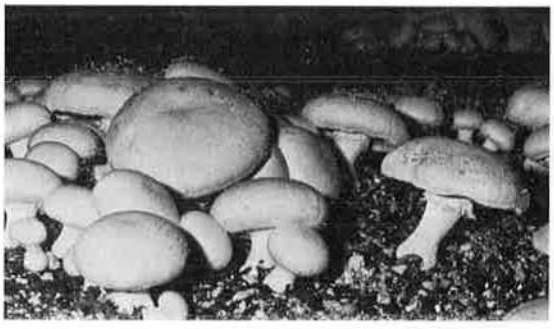
The Production Area is under one Crendon roof and the Preparation Area — or 'Unit' — under another. The unit is a very sophisticated facility, which is all pressurized with fully filtered air. From the moment of filling to end of crop every operation is under these strictly controlled conditions, the preparation unit, which has the strictest practicable hygiene, even including the fact that two fork-lifts which operate within this unit, never see the light of day!

In practice the compost, ready for peak-heat, enters the unit at one end and the boxes, almost at the picking stage, come out at the other. Every precaution is taken to keep this preparation area free from contamination. No one works in this area unless under the supervision of a cultural director, who, like the rest of the work force, goes through the changing room/air locks on entering and leaving the section. Everyone in the unit wears special 'clean' overalls and boots.

One of the three cultural directors, Peter Davies, making a routine compost temperature and moisture content check

Picking, Packing and Marketing

Over the last twelve months the picking average worked out at 41.6 lb. per hour, mush-



Shackleford's real speciality — solid, open mushrooms deliberately produced

rooms picked, packed and all the ancillary work like cleaning up included. If the situation so demands, everyone on the farm, including the directors, lends a hand at picking and packing, even though this has involved working almost throughout the night at times. But in all its history not a single pound of mushrooms has been thrown away.

Picking lasts a long time — eleven weeks — so hygiene is terribly important. Pickers wear freshly laundered overalls and gloves every day; the houses are always picked in strict order, cleanest and newest first. Every shed has all its own picking and cultural equipment so that nothing is moved from one shed to another. So far the farm has retained the effectiveness of Benlate against *Verticillium* by limiting its use and concentrating on routine hygiene. 'We have also managed to eliminate all bacterial diseases. At last we also seem to have greatly improved the "truffle" situation, which was becoming significant; this has been by better control of box temperatures. There is no doubt in our minds', says Peter, 'that the mushrooms produced in the last three weeks of the crop's life are the most profitable mushrooms we grow, (a) because all the main production costs have already been paid, and (b) we are able to produce a very large, long-lasting mushroom for which there is a limited but highly profitable demand. We pick 50% of our mushrooms closed and 50% as mushrooms which are deliberately and purposely grown as opens. We find a steady demand for a really first-class open mushroom.'

Half the production goes to the wholesale market at Covent Garden and half is collected daily by secondary wholesalers. Virtually all the mushrooms grown are ordered, either by the

market or by direct sales, and the farm adjusts its production of grades to meet its known demand.

Says Peter: 'We will not take on more than 50% for the secondary wholesalers because in our view wholesale markets should be supported regularly and efficiently. The using of wholesale markets as a dumping ground by many growers is, in my view, a highly dangerous procedure.'

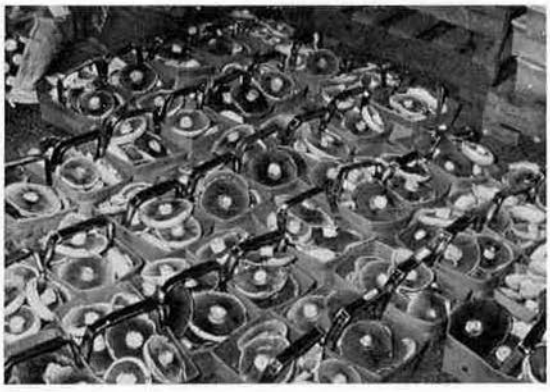
Close daily contact is maintained with the market and with the direct sales outlets, and market sendings are classed as moderate for Monday and Tuesday morning sales, light for Wednesday, heavy for Thursday and Friday (helped by the judicious use of the cold stores). Two wholesalers are used — a long distance apart in the market — the second specializing in grades not required by the first.

The majority of the 'opens' go to market and thence to the catering trade, although there is strong evidence that such mushrooms are in increasing demand by local wholesalers, provided they can be got into the shops very quickly.

Current net return on all grades is just over 50p per lb.

Farm Staff

The staff set-up for this quite remarkable yet small mushroom farm is surprising. In all 28 people are employed: the office staff consists of one full-time and two part-time employees; there are five people employed in the workshop, eight cultural workers and twelve pickers and packers. These figures include the three cultural directors and one engineering director — all



Just what Shackleford's open mushrooms really look like prior to being sent to market

A general view of the packing shed with most of the open mushrooms on the left

engineering and electrical work is done by the farm staff, as is all building and construction work.

One of the many remarkable aspects of this farm is the fact that almost all the mechanical aids and environmental equipment used on the farm are constructed to Shackleford's own design — as in the case of the Compost Turner, the Press and the Filling Line, which are all actually Tamplin built — or designed and built completely on the farm itself. Even the original Carlisle Coolers are now almost unrecognizable! All of which explains the presence of an engineering director. The farm is very conscious of the importance of regular replacement of all capital equipment and this is pursued.

Used Compost

At the moment all the used compost is disposed of as quickly as possible to local growers and farmers at a modest charge. This is not regarded as satisfactory in view of the admitted high potential for sales to private householders in the neighbourhood. The used compost has to be cleared from the farm within four hours; when time allows, used compost sales will be put on a more rational and profitable basis.

The Difference and the Future

What, then, sets this farm apart, in addition to the points already dealt with? Like the tremendous turnover, currently running at an annual rate of around £450,000 from such a small production area, with, one hopes and expects, pretty high net profitability.

Shackleford sets it out thus:

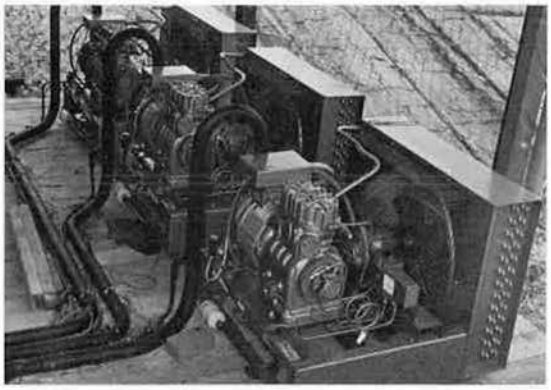
VIVE LA DIFFÉRENCE!

1. *A highly successful Father/Son working relationship.*
2. *Directors who run all day-to-day cultural operations and working with the staff make all growing decisions and alterations and do all the watering.*
3. *Fanatical attention to detail and hygiene.*
4. *Developing a system with* **very deep** *boxes.*
5. *A high level of Management input per square foot.*
6. *A more highly capitalized unit per square foot than any other farm.*
7. *A determination to maintain a small size farm.*
8. *A highly flexible and loyal staff.*
9. *One or more Directors are on duty twenty-four hours a day.*
10. *Highly mechanized.*
11. *High engineering ratio to support mechanization.*
12. *Most engineering and building done by our own staff.*

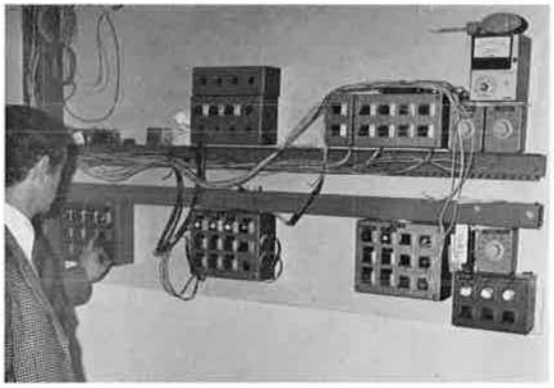
One of the most vital parts of the whole growing system is, says David, the close notes the Directors keep of all cultural decisions on all crops. These notes are probably the most valuable thing on the farm, so much so that copies are made and kept in a separate cabinet away from the farm in case of fire. 'We never cease to refer to them and we are now putting a lot of this information into figures in order to feed them into a computer so that we can extrapolate, more quickly, the finer points', says David.

With an eye to the future and the doubling of the compost intake into deeper and deeper beds, when a new machine is built, a cold store or any facility, the immediate need is worked out, the capacity is then doubled and the facility installed. That is the philosophy behind this farm.

Thus a new Tamplin press for instance, has the capacity to deal with boxes containing compost 4 ft. thick, and to exert a pressure of 90 tons. Another instance is the coolers, which have the capacity to keep the spawn and case-running room temperatures just above freezing — what that would do to the compost is problematical, but the capacity is certainly there.



Some of the new cooling compressors on the unit



Part of the newly-installed control equipment located at the entrance to the processing area

In the new peak-heat, spawn-running and case-running unit the controls, in each of three chambers, modulate supply to the heat-exchangers and coolers, simply — in theory anyway — by the manipulation of a single knob on the new control panel.

The two most recent crops at the time of my visit had been case-run at temperatures in the mid fifties °F. and had produced the farm's best yields to date. On the single zone system, abandoned only a few months ago, it would not have been possible to keep the spawn-running temperatures down artificially to the level wanted without considerable amounts of fresh air cooling. Now on three zone, it is possible to manipulate the CO_2 levels when initiating to the exact level required. On the single zone, matters were really being run by the compost temperatures.

David says: 'This is probably our next area of improvement in the Unit — to have fresh air and CO_2 levels under complete control. We have only just started looking into the instruments necessary for this and it is an exciting prospect. One thing that staggered us was when we asked people about maximum levels of carbon dioxide, for instance — people who should know — we were told anything between 0.2% and 2%.' Peter joined in, saying: 'We have found, with our system, that we virtually have to work out our own salvation. We have had to solve nine out of ten of our problems ourselves, simply because there was no precedent for what we were trying to do. That is why I am so lucky to have young directors around me. They embue me with as much enthusiasm for mushroom growing as I ever had. But for them the farm would certainly still be on the single zone.' He added that Shackleford was in the middle of an exciting development with control of CO_2 for initiation — a new field for the farm and one which the results so far had proved dramatically successful.

Continuity of Supply

Over now to David, who says: 'One of the most difficult facets of our production — because we only fill fortnightly — is getting continuity of supplies of mushrooms. With a fortnightly fill this proves a great problem, but over the last two crops, and agreeing that these are early days, we now seem to have the ability to time our crops to within half-a-day of just what we require. It means that we can start picking almost exactly when we want to and not when the mushrooms themselves want to come. Not only does this concern the first flush, but subsequent flushes as well.'

No Secret System

Peter: 'There is no secret about our system — we have simply evolved a method of putting in and successfully managing more compost into our boxes than anyone else and we are prepared to take time and trouble to utilize all that

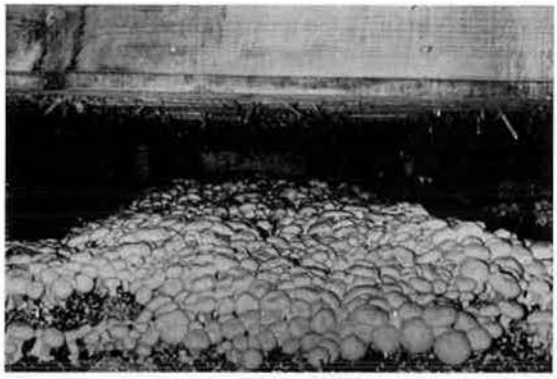
Some of the equipment for environmental control, outside the production buildings

compost. It takes a surprising amount of time, trouble and capital to grow on that depth of compost satisfactorily. The basic object of our exercise is to have the maximum difference between our cost of production and selling price. We feel that using deep growing boxes is the best method of achieving this objective. If we knew of any system better than our own, we would change tomorrow, but so far we have not found such a system.'

Harm to other Farms

In the past visitors — mushroom growers, of course — have come in large numbers to Shackleford Mushrooms and have been shown every phase of production. But, in the words of David, 'we are always very much aware and concerned over the fact that we have done a lot of damage to growers in the past, by showing them how it is possible to get higher yields chiefly by simply putting in more compost. People have gone away and tried it, and it has cost them a lot of money. The plea which we make is for goodness' sake try it first on a very small scale. We have this staggering amount of cooling, and enormous amounts of fan power, adequate and controlled ventilation and very big air-to-bed ratio. At present we have a total of 180 tons of cooling; we filter everywhere we can think of, including cropping houses. Our pre-production chambers have fans capable of delivering over 3 c.f.m. per sq. ft. and we can give our cropping houses over 2 c.f.m. per sq. ft. In addition, four directors, who never stop fussing around six growing sheds. It is possible, with the great attention to detail on a farm of our size, to have this level of control, but on a farm of, say 200,000 sq. ft., it would be an entirely different matter.'

Peter joined in to say that some of the greatest mushroom authorities in the world had said time and again that prophylactic hygiene was not an economic proposition, but, he said: 'We have always felt that prophylactic hygiene is one of the corner-stones of our system. We spend a lot of money on it and we think that every penny is well spent. We are always seeking to improve our overall level of hygiene, to try to get our retaliation in first. To this end, we are about to install exhaust filtration on all our cropping houses; this will undoubtedly be fairly costly, but we feel a very worthwhile insurance policy.'



A right royal flush of mushrooms

Odds and Ends

Every single facet of growing on this farm is controlled by at least one of the cultural directors. Nobody else takes the simplest cultural decisions. At least one of these three directors is on duty for 24 hours a day on the farm, or at the end of a call bell. In addition, and in the case of breakdown, the GPO operates a special five-phone alarm system, calling director number one first and, if this fails, going on to the next, and so on.

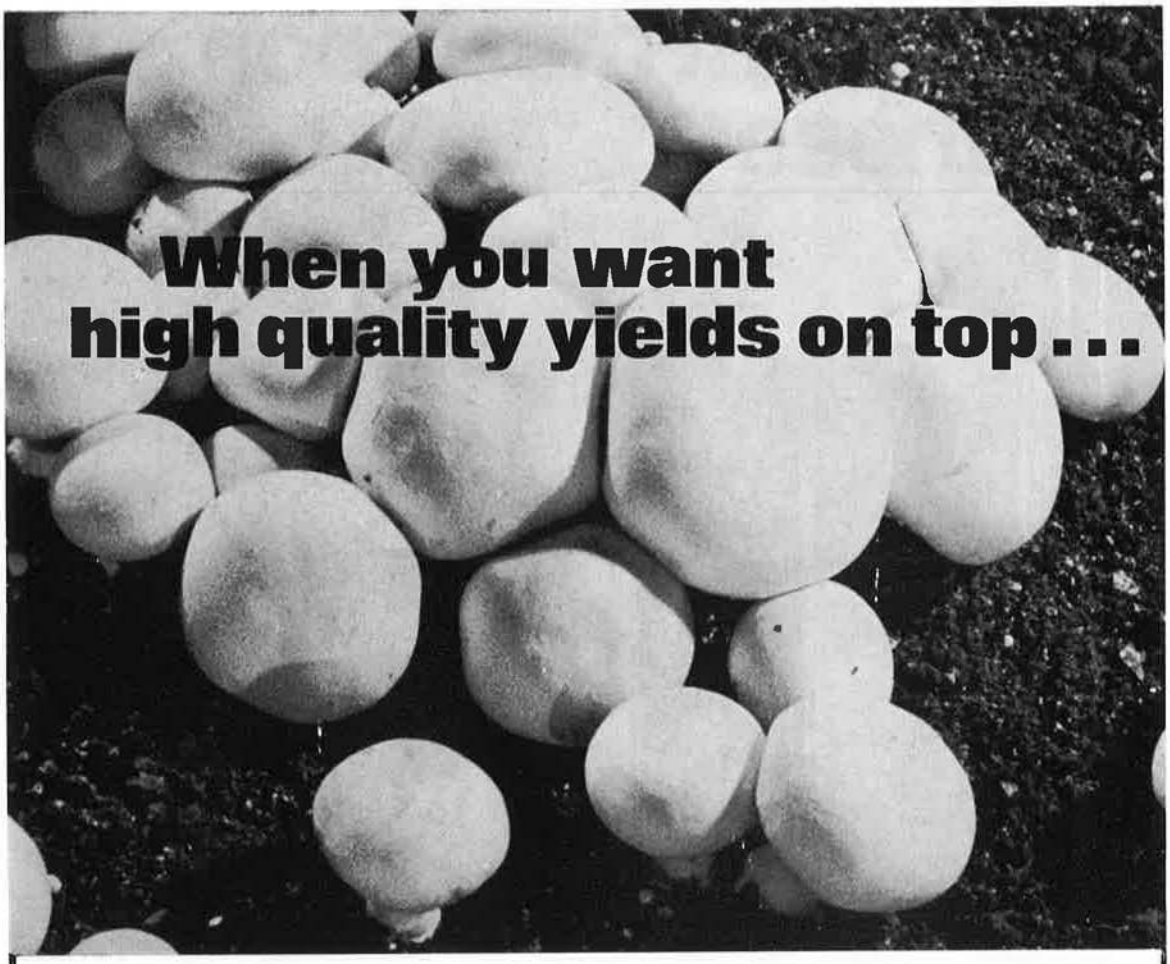
At the end of cropping there is a very thorough cook-out programme with the bottom boxes held at 160°F. (71°C. approx.) for ten hours. Once emptied the boxes are treated with Santobrite and are then given yet another cook-out for 12 hours at 180°F. (82°C. approx.). Box life is reckoned at seven years.

Shackleford Mushrooms is, to put it mildly, a remarkable farm. The amount of capital generated from farm profits and re-invested in the enterprise is, to say the least, quite staggering. Since the farm started no outside capital has been used at all — one should add that the H.I.S. came at an opportune time. A month or two ago the farm's insurance company calculated the replacement value of lock, stock and barrel at the extraordinary figure of over £2.6m! The mind boggles.

WRA

ADAS SERVICE ESSENTIAL

'It is inconceivable that we could do without the assistance of ADAS' said Mr. Peter Pearson, Chairman of the NFU Central Horticultural Committee, speaking at Wisbech on 20th April.



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For all mushroom growers who are seeking a high-quality compost to ensure better growing and increased yields. Who want a technical back-up service which will help you analyse your particular growing problems and come up with answers to keep your production schedules on-line. There is only one name which starts you right and brings you out on top — BURCROS

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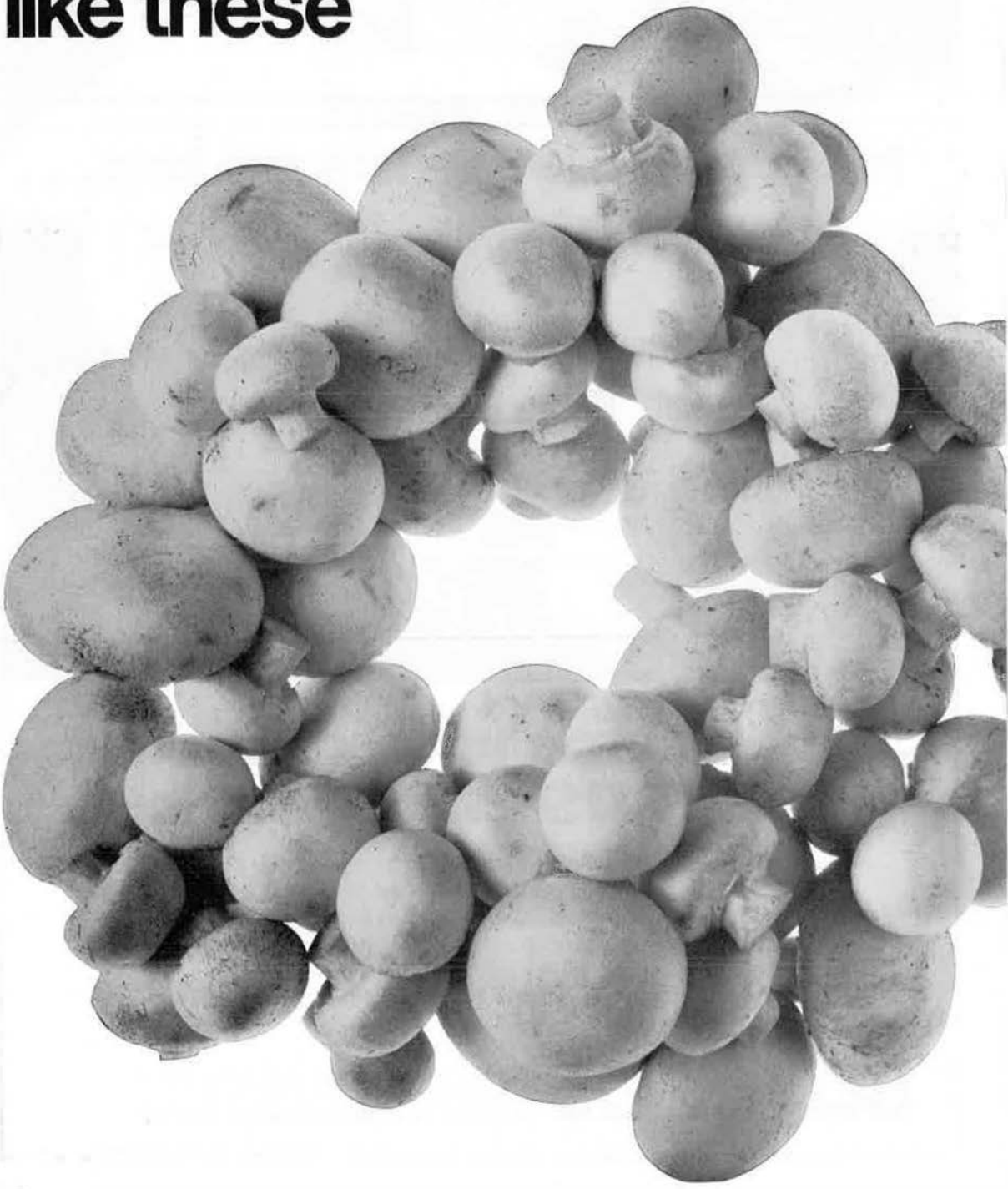

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INTERNATIONAL

STRONG SUPPORT FOR 10th INTERNATIONAL CONGRESS

By the end of March 446 paid-up delegates had registered for the 10th International Congress commencing on 5th June at Bordeaux, France, and concluding with a banquet in Paris on 15th June.

It is confidently anticipated that, when the congress opens, an additional 100 delegates will have registered, making a total attendance of 550.

Excellent support has been forthcoming, not only for the more serious side of the congress, with the presentation of a wide-ranging series of papers, both at the Symposium (5th–6th June) dealing with the more scientific aspects of the mushroom, but at the congress itself which follows on 8th, 9th and 10th June. Already 320 delegates have registered to attend the final banquet in Paris (15th June), 290 (the dinner in Abbaye de Fontevraud, 13th June) and 300 (banquet at the Château de Bourdelais Bordeaux, a few days earlier — 9th June). There has been solid booking (240) for the visit to the Perigord truffle-growing area on Sunday, 11th June, and even heavier support for the visits to the mushroom growing area in the Loire area. Late registering delegates may well find it difficult to join in some of the tours owing to the pressure on hotel accommodation — particularly is this so with regard to the Loire Valley tour.

Delegates to this ambitious congress will receive, on arrival and when registering, two bound copies of abstracts of papers to be presented, one dealing with the Symposium papers and the other covering those presented at the Congress. Together these booklets cover 230 pages.

M. Jean Laborde, the Congress Secretary, reports that the organization work is proceeding smoothly and that, if necessary, up to 600 delegates can be accommodated with the exception already mentioned — for several excursions last-minute registrations will not be accepted because of hotel accommodation difficulties.

The numbers of delegates, with their country of origin, who had been fully registered by the end of March are as follows:

U.S.A. and Canada	100
France	90
England	50
Australia	30
Germany, Austria and Switzerland	40
Holland	20
Italy	20
Spain and Portugal	20
Eastern countries	20
Japan	24
Taiwan	12
Far Eastern countries (others)	10
South America	10
	446

Papers to be presented to the Symposium and Congress

The papers are grouped by subject matter and it is assumed that they will be given in the order shown.

Symposium Monday–Tuesday 5th–6th June

Genetics: 23 papers:
Agaricus 7, *Pleurotus* 4, *Volvariella* 2, *Lentinus* 3, other species 2.

Microbiology: of substrates 5, of *Agaricus bisporus* 4.

Biochemistry: 12

Growth of mycelium: 6

Fructification: *Agaricus* 7, other genera 5

Diseases and pests: 6

Ecology and domestication: 8

Mycorrhiza: 11

Congress Thursday–Friday–Saturday morning 8th–9th–10th June
Thursday 15 June

Substrates, compost, etc.: 13

Cultural: methods 19 casing 5

Disease and pest control: 7

Mites, insects, nematodes: 6

Cultivation of various fungi: temperature 14
tropical 13

Quality of mushrooms: 10

Conservation, processing: 5
Medical aspects: 4
Economics: 5 (in Paris: 15th June)

Some papers will also be displayed in the Poster Hall:

Symposium papers on Monday and Tuesday, 5th–6th June
Congress papers on Thursday–Friday–Saturday, 8th–10th June.

MGA Literature List

Compiled by Dr. R. L. Edwards

Copies of literature cited are available from the MGA office or Science Reference Library. See *Journal* No. 47, Nov. 1976, page 378.

SRL = Science Reference Library.
MGA = Mushroom Growers' Association.

The field of interest covered by a paper is indicated as follows:

C. Commercial, economic
P. Practical growing
R. Scientific, research, experimental

1077
R. Studies on genus *Morchella* in Jammu and Kashmir. 1. Soil composition in relation to carpophore development.
T. N. Kaul, 1975
Bull. Botan. Soc. Bengal, **29,** 127–34 RLE

1078
R. Laboratory rearing of the mushroom phorid *Megaselia halterata* (Diptera: Phoridae)
P. N. Richardson, J. J. Hesling, 1978
Ann. Appl. Biol., **88** (2), 211–17 SRL

1079
P. Tunnel growing in Ottersum
P. J. C. Vedder, 1978 (in German, illustrated)
Der Champignon, **199,** 10–12 MGA

1080
P. Cultivation of *Agaricus bitorquis*
J. S. Klaver, 1978 (in German)
Der Champignon, **199,** 18–22 MGA

1081
P. Use of spent compost as casing material.
N. G. Nair, 1978 (in German)
Der Champignon, **199,** 24–27 MGA
(Translated from *Mushroom News*, September 1977)

1082
P. Edible fungi and their cultivation prospects
P. J. C. Vedder, 1978 (in Dutch)
Groenten en Fruit, **33** (36), 89–92 RLE

1083
P. Prospects for Truffle growing.
Anon., 1978 (in Dutch)
Groenten en Fruit, **33** (34), 65–66 RLE

1084
P. French success in Truffle growing.
(in Dutch)
Groenten en Fruit, **33** (34), 67 RLE

1085
CP. Lutèce — Holland B.V.
(in Dutch)
Groenten en Fruit, **33** (35), 74–76;
33 (36), 85–87 RLE

1086
R. Enrichment, isolation, and assay of growth of thermophilic and thermotolerant fungi in lignin-containing media.
M. R. Tansey, D. N. Murrmann, B. K. Behnke, E. R. Behnke, 1977
Mycologia, **69** (3), 463–76 SRL

1087
R. Sexual and other relationships in the genus *Agaricus*.
C. A. Raper, G. Kaye, 1978
J. Gen. Microbiol., **105** (1), 135–51 SRL

1088
R. Occurrence of *Aspergillus fumigatus* during composting of sewage sludge.
P. D. Millner, P. B. Marsh, R. B. Snowden, J. F. Parr, 1977
Appl. Environ. Microbiol., **34** (6), 765–72 SRL

1089
R. Some factors affecting the growth rate of sporophores of the cultivated mushroom.
D. O. Chanter, D. Cooke, 1978
Scientia Horticulturae, **8** (1), 27–37 SRL

1090
R. Cadmium in mushrooms.
R. Seeger, 1978 (in German, English abstract)
Z. für Lebensmittel Untersuchung und Forschung, **166** (1), 23 SRL

1091
PR. Evaluation of botulism hazard in fresh mushrooms wrapped in commercial polyvinylchloride film.
D. A. Kautter, T. Lilly, R. Lynt, 1978
J. Food Protection, **41** (2), 120–21 SRL

1092
R. Association of clubshaped virus-like particles with a severe disease of *Agaricus bisporus*.
D. E. Lesemann, R. Koenig, 1977
Phytophathol. Z., **89** (2), 161–69 SRL

1093
Benzimidazole fungicides control Wet Bubble disease in mushrooms.
N. G. Nair, H. J. Baker, 1977
Agric. Gazette, NSW, **88** (3), 24–25 SRL

1094
Mushroom crops from beds cased at several depths and times.
D. K. Chakravarty, 1976
Indian Agriculturist, **20** (2), 91–94
The best yield was obtained by casing ten days after spawning with a casing depth of 4.5 cm.

1095
R. Carbohydrate metabolism in *Agaricus bisporus*: oxidative pathways in mycelium and sporophore.
J. B. W. Hammond, 1977
J. Gen. Microbiol., **102** (2), 245–48 SRL

1096
R. Biochemical aspects of the storage of fruit and vegetables.
P. W. Goodenough, 1977
Home Food Adviser, No. 1, 20–26
From Long Ashton Research Station, Bristol, England.

1097
R. Investigations of residues of benomyl in cultivated mushrooms.
J. Dabrowski, W. Czanik, 1976 (in German, English abstract)
Nachrichten für der Pflanzenschutz in der DDR, **30** (12), 254–56
From Inst. Ochronv Roslin, Poznan, Poland

1098
R. Community relations among fly species (Diptera) associated with mushrooms.
A. Dely-Draskovits, 1976 (in German, English abstract)
Annales Historico-Naturales Musei Nationalis Hungarici, **68,** 191–94
From Hungarian Natural History Museum, H 1088, Budapest, Hungary.

1099
PR. The *Annual Report* of the Federal Research Institute for Fruit, Viti- and Horticulture, Wädenswil, Switzerland, 1974–75 in *Landwirtschaftliches Jahrbuch der Schweiz* (1976), **90** (3/4), 499–590
includes a summary of research on insecticides (pp. 565–66) and on control of mushroom pests (pp. 567–68) (in German)

1100
P. Critical temperatures.
F. C. Atkins, 1978
Funghi International, **3** (4) MGA
in Italian 113–15; in English 115–17

1101
R. Why so few edible mushrooms in cultivation?
R. Cailleaux, 1978
Funghi International, **3** (4) MGA
in Italian 118–24; in English 125–30

GCRI RESEARCH STUDENTSHIP

Applications are invited for an Agricultural Research Council postgraduate studentship tenable in the Microbiology Department of the Glasshouse Crops Research Institute for a period of three years commencing 1st October 1978.

Details of the regulations governing the award point out that the work in the Microbiology Department is mainly concerned with crop diseases, including those of the cultivated mushroom, *Agaricus bisporus*. Special emphasis is laid on serious losses from *Verticillium fungicola* — it is in this area that the student will work. The Institute, covering 100 acres, has a total staff of 260 and all relevant disciplines are represented in the 191 scientific and technical staff. Over 30 members of the staff work on mushrooms.

Candidates, normally under 30 years of age, must be British subjects. The value of the award is £1,475 p.a. for students living in and £1,075 for those living at home. Additional allowances for students with at least two years' post-graduate experience vary from £160 p.a. (aged 22) up to £650 (27 and over) with a £160 figure for students with one year's similar experience since graduation. There are other special allowances, including those, in special circumstances, for dependants.

Fred. C. Atkins *writes about:*

REMOTE-READING THERMOMETERS

Occasionally one still hears the masochistic comment: 'Unless I frequently go into the peak-heat rooms I cannot be sure what is happening.'

The small-scale owner-grower does what he likes, of course; but are sorties of this nature every three or four hours, day and night, really necessary? Apart from the undeniable fact that it is unsafe for individuals to walk round (and clamber up!) trays stacked perhaps ten high, especially when they are unaccompanied, it is an exhausting exercise, and shortage of oxygen can be a hazard.

By all means let us enter twice a day, if we feel anxious; but bed and air temperatures can comfortably and much more rapidly be read from a panel outside — and with greater accuracy.

Remote-reading thermometers are common enough in the mushroom industry nowadays. One rugged instrument is illustrated in my *Guide to Mushroom Growing*, but I was told the other day it was no longer being produced. Could I recommend another, similar instrument, I was asked by an MGA member in Northern Ireland?

I contacted three companies who manufacture them, viz. **Negretti & Zambra Ltd.**, of Stocklake, Aylesbury, Bucks., **Kane-May Ltd.**, of Burrowfield, Welwyn Garden City, Herts., and **Telemechanics Ltd.**, of Pembroke House, 148 Frimley Road, Camberley, Surrey.

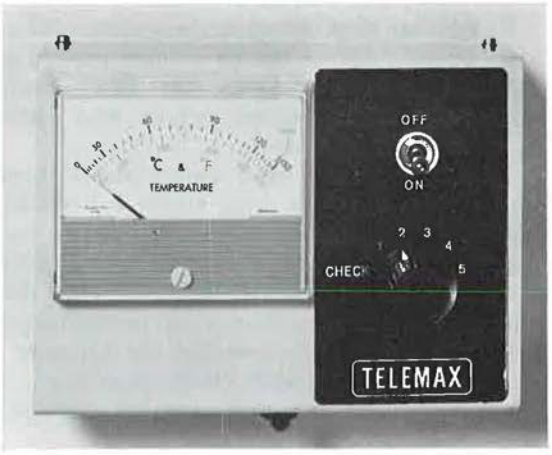
E. W. Turner, Commercial Manager of Telemechanics, came to talk to me about Telemax electronic thermometers. 'Because of the wide range of applications of these instruments in industry', he said, 'we have developed many special units for specific purposes. We have supplied our T-type temperature indicator with switch-box unit for multi-point mushroom compost monitoring. The remote-reading facility offered by this instrument enables it to be located outside the pasteurization room.'

I was told that a special, close-tolerance, interchangeable Thermistor Sensor had been developed for hot, humid environments. This is the P1 vacuum-sealed, steam-proof, PTFE Moulded Probe.

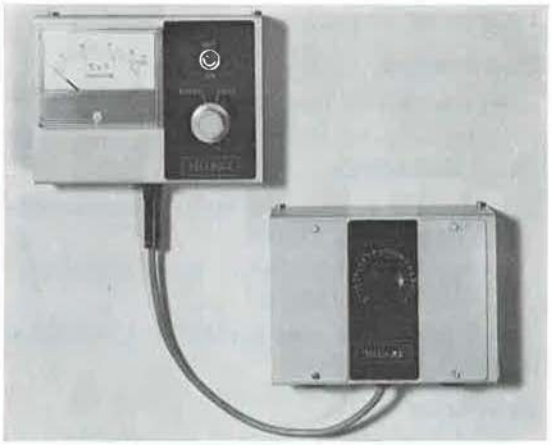
Illustrated are the attractive, wall-mounted Model T Indicator (suitable for up to five sensor probes) and Model BT into which is plugged a 24-way, manual, selector switch. (These, incidentally, can be supplied for 6, 12, 18 or 24 sensor inputs.)

The 24-way switch-box costs £32 today. A 6-way is priced at £22, a 12-way at £23, and an 18-way £28.50. The BT single-input indicator costs £46.75 and the T five-input indicator £48.50. Each probe costs about £11. PVC flexible leads are available at about 13p per metre.

Leads can be vulnerable to forklift cowboys, and I mentioned the annoyance and inconvenience to growers when replacement was



The five-probe indicator



The indicator adapted to the use of 24 probes

delayed. I was assured that in emergencies replacements would be delivered within 24–48 hours. Had we considered reducing the risk to leads trailing along the floor by hanging them from the ceiling? It was an idea new to me.

We went on to discuss more sophistication. Mr. Turner had this to say: 'We could design and provide a completely automatic system for a large plant in which, as an example, there would be four probes for each peak-heat room with up to 20 such rooms in operation at the same time. These would then automatically be monitored and the temperature recorded, showing the particular heat-room and the point number in that room. Also, in the event of any point exceeding a pre-set temperature level, an alarm could be provided. Either audible or visible enunciators could be fitted.'

I am aware that automatic responses such as more or less fresh air can be induced instead of warnings by bells or lights, but there remain many dedicated mushroom growers who prefer to 'go in and take a look'.

Before Mr. Turner left I related one of those stories from the past with which I bore my friends. My first remote-reading system was idiosyncratic: the leads had to be of a specific length and the probes had to be the same distance from the floor as the external thermometer.

No such limitations apply with the Telemax, I was assured. The vertical relationship is of no consequence, and leads as long as 100 metres do not significantly affect readings.

(It is my intention to refer in subsequent issues of the *Journal* to equipment obtainable from **Negretti & Zambra**, **Kane-May** and **Engineering Design.**)

June Journeys

We have a very busy month ahead of us:

31st May–1st June: Mushroom days in the Netherlands.

4th–15th June: Tenth International Congress in France.

19th–21st June: Penn. State University's 21st Short Course.

And remember the Southport Conference: 28th–30th September.

Metrication

MGA headquarters advised us to quote on our basket lids the metric equivalent of 3 lb. as 1.362 kg., 'correcting' an earlier suggestion of 1.361. May I query this? My *Encyclopaedia Britannica* says 1 lb. = 0.45359327 kg. exactly. Therefore 3 lb. = 1.36077711 kg. exactly. I would settle for 1.361 lb. Although it would cost us 300 lb. for every million sold, we could perhaps reduce correspondingly the 1 oz. overweight we generously allow — and often, unwittingly, exceed!

Quote for Today

'A caution must be given to those expanding mushroom production facilities. Expansion is only sensible and economically sound if it is attempted when the increased public demand for mushrooms warrants this increase. Many good industries are harmed by expanding production beyond the development of the market. Examine the market carefully before acting.'

G. Raymond Rettew & Forrest G. Thompson
in *Manual of Mushroom Culture* **(1948)**

What a Waist!

I liked the February 1978 *Women Today* Diet Guide description of the mushroom as a waist-not vegetable! But why not a no-waist vegetable?

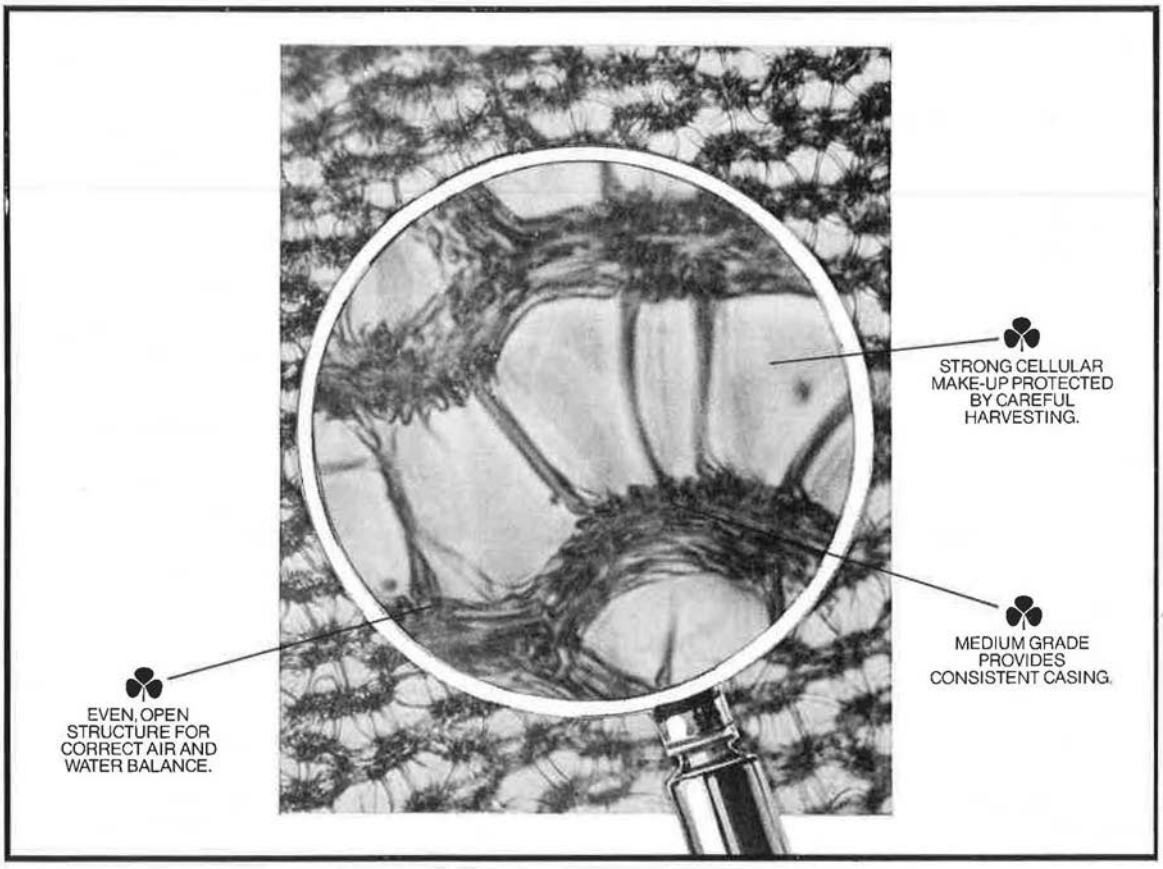
TEETH

According to Arthur Smith, writing in the *Daily Mirror*, dental decay is being tackled in America with chewing gum.

The gum includes a natural sugar named xylitol, produced in berries, fruits, leaves and mushrooms. It is about four times as expensive to produce as ordinary sugar, but, it is claimed, much less harmful to teeth.

ROSE BED MUSHROOMS

The appearance of mushrooms amongst the council's rose beds in the centre of Maidenhead with, it is reported, many early morning shoppers jostling each other to pick them, caused some puzzlement until it was revealed that the rose bushes had been mulched with used mushroom compost. *Evening Mail*, Slough (8 Feb./78).



To be sure- it has to be Irish Moss Peat.

You know the importance of keeping the right balance of water and air within your casing layer.

Irish Moss Peat, medium grade, does this most effectively.

You also want your casing to be consistent.

Always the same grade. Always the same particle size. Always the right air and moisture content.

For heavy, profitable cropping.

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If you use Irish Moss Peat for your mushroom casing you *can* be sure. Because it has the backing of the largest and most experienced producer of peat and fertilised peat products in the British Isles.

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MUSHROOM IMPORT–EXPORT STATISTICS — EUROPE

from **P. M. Schaper,** *Champignoncultuur*, **21** (9), 241–43

Dutch exports of fresh mushrooms, January–June each year, metric tonnes

To	*1975*	*1976*	*1977*	*1977 incr. over 1976*
Belgium	1438	1285	1314	+2%
West Germany	1221	550	235	−57%
Austria	602	407	383	−6%
Switzerland	71	78	51	−35%
Other countries	62	10	18	+80%
Total	3394	2330	2001	−14%
Av. export price		3.43	4.10	+20% (guilders/kg.)

Dutch exports of processed mushrooms, January–June each year, metric tonnes

To	*1975*	*1976*	*1977*	*1977 incr. over 1976*
West Germany	14339	16379	17065	+4%
Belgium	393	691	585	−15%
Sweden	116	119	47	−61%
Other countries	65	81	155	+91%
Total	14913	17270	17852	
Av. export price		3.38	4.17	+23% (guilders/kg.)

Processed mushroom imports to West Germany, January–June each year, metric tonnes

From	*1976*	*1977*	*1977 incr. over 1976*
France	17559 (36.6%)	15063 (29.6%)	−14%
Holland	15917 (33.2%)	17129 (33.6%)	+8%
Belgium	1093	1207	
Italy	377	1479	
Ireland		5	
UK	228		
Total EEC	35174 (73.4%)	34883 (68.5%)	−1%
China (mainland)	7876 (16.4%)	7555 (14.8%)	−4%
Taiwan	3708 (7.7%)	6879 (13.5%)	+85%
S. Korea	940	1032	
Other countries	237	580	
Total from third countries	12761 (26.6%)	16046 (31.5%)	+26%
Total all sources	47935	50929	+6%

RLE

NEW COURSE IN HOLLAND

The Director of the Dutch Mushroom School, Mr. P. J. C. Vedder, proposes to hold a two-week course on 'Introduction to Mushroom Growing', particularly adapted for newcomers to the industry or those with little experience.

It would be conducted in English, probably in September, and would be limited to ten students. Arrangements could be made for some students to stay on longer for practical experience or private study.

The fees would be 550 guilders (£139.00) for the two weeks, covering hostel accommodation, school and visits, plus about 200 guilders (£50.00) per week after that, and weekend meals are not provided.

Those interested should write to Mr. Vedder at:

CCO
Westerholtstraat 2
5961 BJ Horst (L.)
Netherlands

saying whether they are interested in staying longer than two weeks, or not.

RLE

THE FARM AND HORTICULTURE DEVELOPMENT SCHEME

The Farm and Horticulture Development Scheme has been growing as more and more farmers have decided to join the Scheme for planned investment for agriculture and horticulture, stated a Ministry of Agriculture Press Release (27th Feb./78).

The FHDS came into operation in January 1974 to implement one of a package of EEC measures aimed at the modernization of farm structure in the Community. Aid is given in the form of capital grants at varying rates on a wide range of agricultural and horticultural items, and Guidance Premium, a lump-sum of great benefit to livestock producers. The EEC reimburses 25% of the Government's payment under the Scheme.

The aim of the FHDS is to raise the level of farmers' and growers' incomes to that of non-agricultural workers. Thus the first requirement for entry to the Scheme is that the applicant's labour income is below the 'comparable income' which is £3,800 in Great Britain this year. The applicant also has to show that farming is his main business, and that he is properly qualified. He then has to propose and agree with the Ministry of Agriculture a 'development plan' which details planned investment for a period of up to six years and which will raise his farm income to the level of the comparable income.

The advantage of investment under FHDS is that there are higher rates of grant available over a wider range of items than under other Ministry schemes. But the Scheme is more complicated, and this seems to have deterred potential applicants in the early days. After a slow start in the first two years, the Scheme was simplified in June 1976 and at the same time higher rates of grant were introduced for aspects of grassland improvement and dairy farming. Higher rates for certain items were also introduced for hill areas.

Since the June 1976 changes, interest in the Scheme has increased sharply and the table below shows how things have gone.

Uptake of FHDS

Development Plans Approved

	1974	1975	1976	1977
England and Wales	120	372	1331	4271*
Scotland	11	80	414	1463*
Northern Ireland	15	27	207	703†
	146	479	1952	6437

*Provisional

†Provisional figures to end of September only.

The indications are that this surge has now eased and that applications will remain constant at about the present level.

Total cost of investment approved in 1977 was £303,474,102. Uptake of the Scheme is encouraging and investment committed under development plans is on a large scale. There is some need for caution however as investment under other schemes has declined and many of the works committed under FHDS have yet to be turned into real investment. Nevertheless the Scheme has provided opportunity and the results will benefit the country with additional food and better earnings in agriculture.

VEGETABLE PRODUCTION — OUTDOORS

Figures given by the Ministry of Agriculture show that the estimated area devoted to outdoor vegetable production in 1977 was up by an average of 18.1%. The figures included acreage still to be harvested by the end of 1977.

There was a 24% increase in summer and autumn cabbage, as well as in Dutch White cabbage, and a staggering 43% increase in 'other winter' cabbage. Swedes, not for stock-feeding, rose by 35%, autumn and winter savoys by 32%, lettuce by 30% and leeks by 29%.

EARNINGS BY AGRICULTURAL AND HORTICULTURAL WORKERS

The Ministry of Agriculture state that, for the year which ended on 31st December 1977, the average earnings by horticultural workers was £50.65 for a 43.5 hour working week, compared with £45.83 for a 43.1 hour week in 1976. The average for all hired men has risen from £34.52 in 1974 to £54.84 in 1977.

NEW BUBBLE DISEASE CONTROL CLAIMED FOR MUSHROOMS

Hymush, a new dry bubble and bubble disease control for mushrooms has been launched by Agrichem Ltd., through its marketing subsidiary, Hyag Chemicals Ltd., Warrington, Cheshire.

The new product, which is applied as a wettable powder, can be used either as a pre-casing drench or incorporation, or as a weekly spray during flushes. Hymush is compatible with most other pesticides including formalin.

Hymush will treat dry bubble disease (*Verticillium fungicola*) and bubble disease (*Mycogone perniciosa*) in any degree of severity, simply by varying the number of applications, the manufacturers claim.

MINSTER COMPOST

According to the *Nurseryman and Garden Centre* (26 Jan./78), the firm of Heatherwood Nurseries, one of the founder-members of the John Innes Manufacturers Association, is now producing its Minster brand compost for mushroom growing.

PLANNERS SAY NO!

A report in the *Cambridge Evening News* (5 Jan./78) said that the South Cambridgeshire District Council's Development Control Sub-committee had turned down a proposal by Mr. B. Watrasiewicz to erect buildings for 6,000 sq. ft. of mushroom growing at Wimpole Road, Barton, in a prominent but isolated position adjacent to the Lords Bridge Telescope.

IT PAYS TO BUY BIG

A story in the Glasgow *Sunday Mail* (12 March/78) relates how a woman shopper in Marks and Spencers, East Kilbride, paid at the rate of 74p per lb. for a ½-lb. pre-pack of mushrooms and noticed that, alongside, mushrooms of the same quality but in ¼-lb. packs were selling at the rate of 84p per lb. Why the difference? she asked.

A spokesman for Marks and Spencers explained that it was much more fiddly to fill the smaller packs when, in fact, most people were now buying in ½ lb.

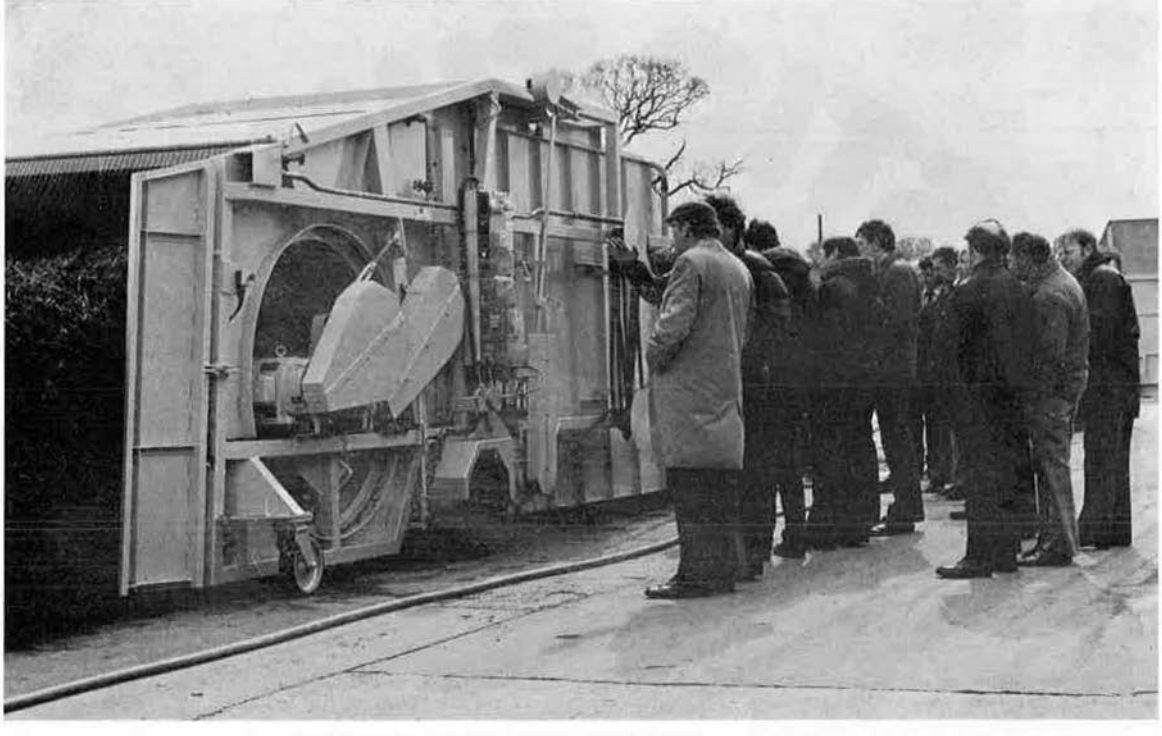
TRAYMASTER COMPOST TURNERS 1978

Traymaster recently gave two demonstrations of their 2000 ESB Compost Turner at their works on the site of Catfield Mushroom Farm, Norfolk.

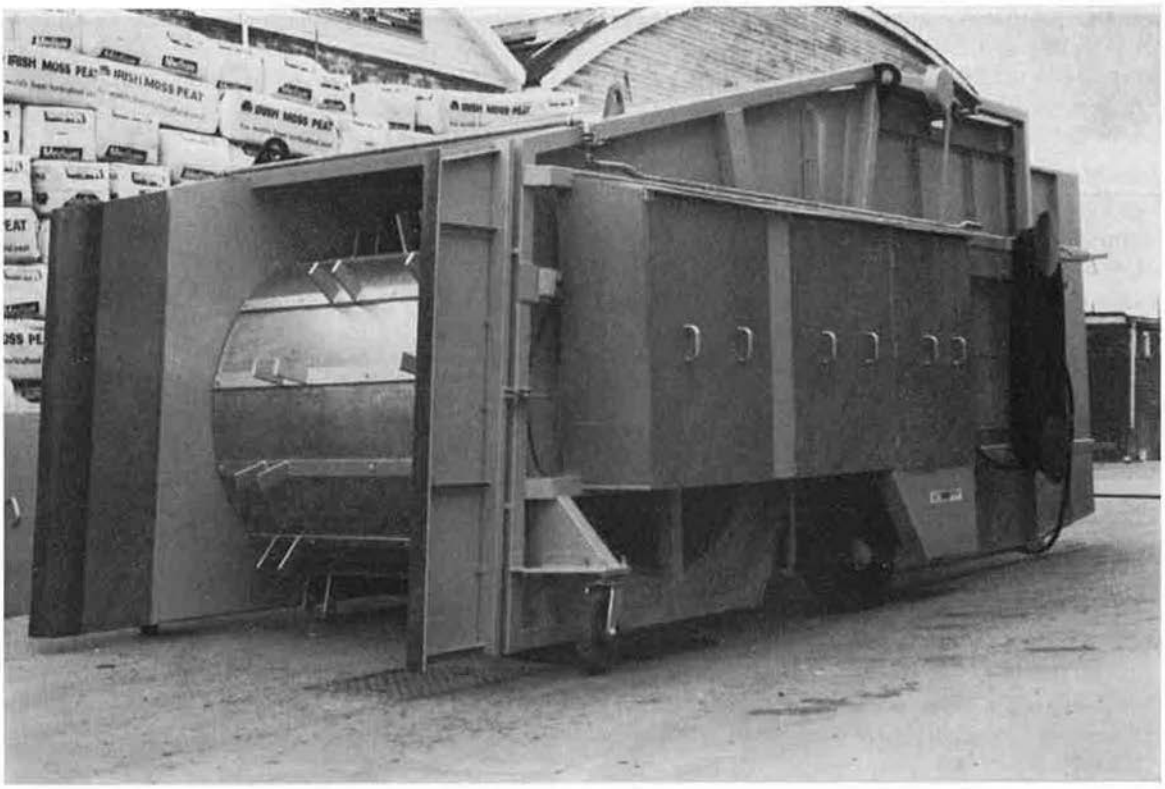
The Composter used was electrically powered with a two-metre entry width and is one of a range made by Traymaster using the single drum and single thrower principle.

Although capable of up to 110 tons/hour, an impressive turning rate of over 60 tons/hour was used during the demonstration 3rd and 4th turns, attended by interested representatives from Hensby Composts, Darlingtons, Snowcap Mushrooms, D. T. R. Beardsell, Redmay Mushrooms, Shepherds Grove Mushrooms, Birds Farm Mushrooms, Broadlands Mushrooms and Catfield Mushrooms.

Those present were also shown round the Traymaster workshop where, amongst other things, a composter frame surrounded by components was on show, demonstrating the functional simplicity and 'easy maintenance' concept of the Traymaster machines. Other models



Visitors inspecting the Traymaster composting machine



Do yourself a good turn!

CHANGE TO TRAYMASTER

The compost turner with all the advantages

- Ample power
- Corrosion free pile formers
- Own length powered turn round
- Easy to maintain
- After sales service

TRAYMASTER
The Mushroom Machinery Specialists

Our Address

Engineering Design & Production Ltd
Catfield, Great Yarmouth, Norfolk, England
Tel. STALHAM 80040

available in this range are the 2200 (2.2 metres entry width) and 2400 (2.4 metres entry width) either diesel or electric.

A general chat then ensued during the wine and buffet lunch provided by Traymaster.

General Specification of the Standard Traymaster 2000 ESB

Turning Capacity
Up to 110 tons/hour

Maximum Pile Entry Width
2 metres (6′ 6¾″)

Pile Forming Width
1.5 to 1.8 metres (4′ 11″ to 6′ 2¾″)

Overall Machine Width
2.9 metres (9′ 6″)

Overall Machine Height
2.81 metres (9′ 3″)

Overall Machine Length — Turning
6.8 metres (22′ 4″)

Minimum Overall Machine Length — Manœuvring
5.7 metres (18′ 9″)

Turning Circle Diameter (continuous powered turn)
6.2 metres (20′ 4″)

Weight (approx.)
5.5 tonnes

Steering:
Each drive wheel is independently driven and infinitely variable in speed, forward and reverse.

Construction:
Main frame ¼″ thick steel rectangular hollow section. Fixed cladding of 'Corten' steel. Front adjustable guides, rear pile formers and flap of either non-corrodable industrial PVC or corrosion resistant 'Corten'. Front pick-up drum can be dismantled for ease of maintenance.

CATERPILLAR LIFT TRUCK AID MUSHROOM HANDLING

The Darlington group have been involved in the mushroom growing industry for over 100 years. Their Agaric plant at Frome Road, Bradford-on-Avon, Wilts., is unique in that it is situated in an underground quarry once used for the extraction of Bath stone.

Five Caterpillar V50B gas-powered hydrostatic lift-trucks supplied by Bowmaker (Plant) Limited of Cannock, Staffs., play a major part in the handling of the product from the composting stage to the cropping itself.

The farm is split up into two parts. On the one side of the main dividing road is the composting, pasteurization, spawning and casing area. On the other side of the road is the quarry. Out of the five trucks employed at the farm, three are used in the composting and casing area, whilst the remainder are used for unloading tractor-drawn trailers transporting filled and spawned trays into the growing area of the quarry.

To enable the trucks to work in the unusual environment, full road lighting and lowered overhead guards are fitted. Precise positioning of the pallets is achieved through the use of an extra wide side-shift attachment. A load accumulator and upswept exhaust complete the specification of the 5,000 lb. capacity trucks.

Caterpillar V50B transferring trays of spawned compost into the growing area inside the quarry

TAKE CARE

Growers are again reminded of the need to take great care in the disposal of empty pesticide containers, because of the pollution danger to people, livestock and wildlife. Copies of *Code of Practice for Disposal of Unwanted Pesticides and Containers on Farms* may be had, free of charge, from the Divisional Offices of the Ministry of Agriculture.

QUALITY AND SERVICE FOR THE DISCERNING GROWER

TELEPHONE RAMSEY (0487) 840375

- *Reasonable haulage to all parts of the country*
- *Mushroom growers are cordially invited to inspect our compost being produced*
- *Our technical advisory service is available to all our growers*

Well done, Harry. That should shake one or two people down in Surrey

SMALL ADVERTISEMENTS

8p per word

ATTACK CECID LARVAE WITH

Monsanto's registered trade name for Technical Sodium Pentachlorophenate.

For further information contact:

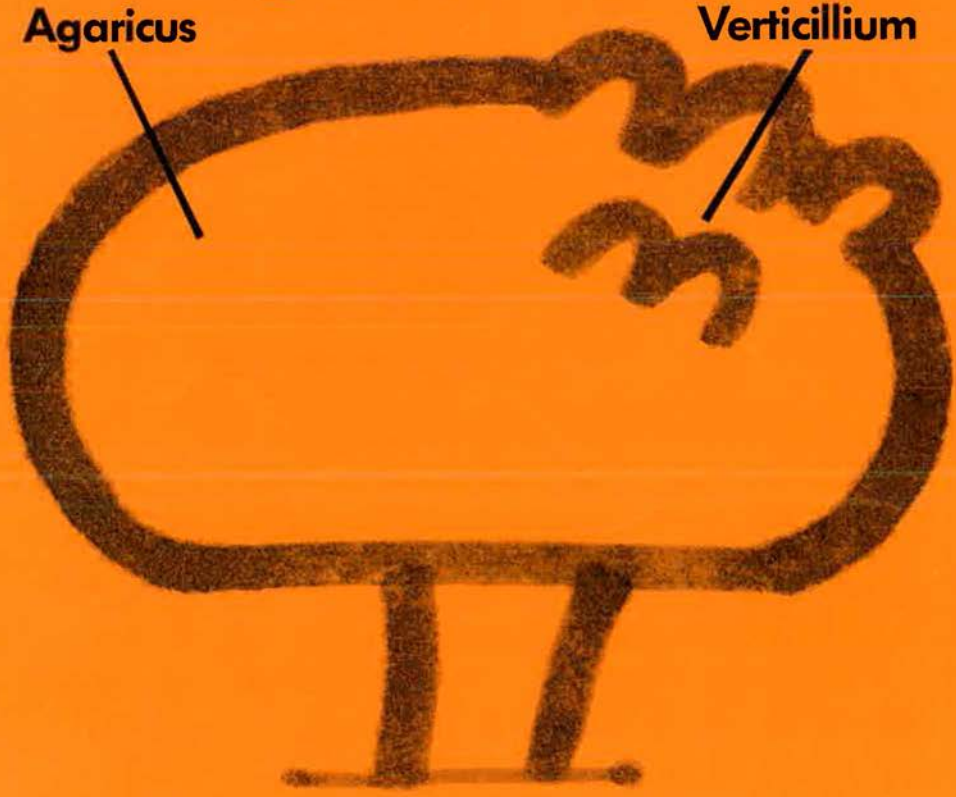
BY APPOINTMENT TO HER MAJESTY THE QUEEN SUPPLIERS OF HORTICULTURAL CHEMICALS KILIAN & CRISP (GREAT BADDOW) LIMITED GREAT BADDOW

KILIAN & CRISP (GREAT BADDOW) LIMITED.

Baddow Park, Great Baddow, Chelmsford, Essex, Telephone: Chelmsford 72361/4 Telex: 995225.

SOLE DISTRIBUTORS TO THE MUSHROOM INDUSTRY

DACONIL 2787 W.75 from Midox can tell the difference between fungus and fungus



Verticillium (dry bubble) feels very much at home on a mushroom.

After all, they're both fungii together.

One you want. One you don't. But there are few efficient fungicides selective enough to discriminate between them.

So to keep your mushroom crop bubble free, you need something more effective. Daconil 2787 W-75, from Midox.

In packs of either 2½kg. or 25kg., Daconil is of wettable powder formulation and a broad spectrum, non-systemic fungicide. It combines a wide spectrum of crop safety when used as recommended. So harvesting could take place 24 hours after spraying.

Best of all it gives you highly effective control of verticillium and all its works.

So your mushrooms will never be seen in bad company.

Midox
Duphar-Midox Ltd
Smarden, Kent.
Tel: Smarden 541/2/3.

Daconil 2787 W-75 is a registered trade mark of Diamond Shamrock.