

The Mushroom Journal

JUNE 1989
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Official Journal of the
Mushroom Growers'
Association

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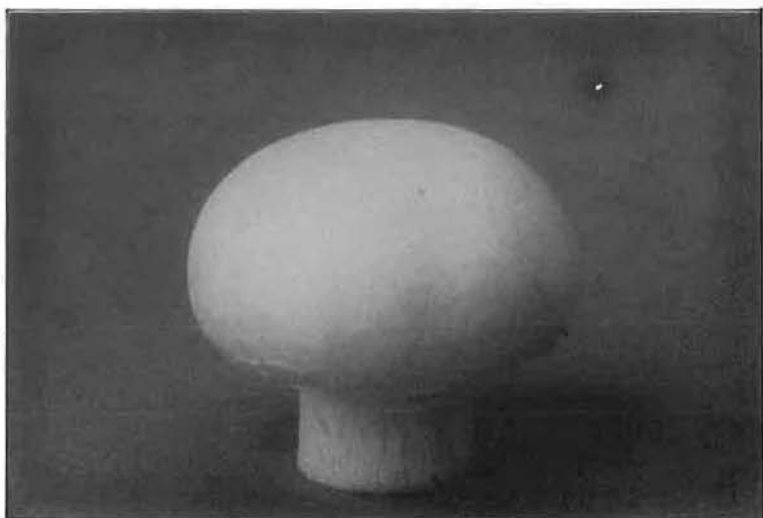


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Director's Notes

Ken James



Let activity and action *Mushroom!*

My notes this month reflect a great deal of activity and effort, by staff and growers - the question I must always ask is; 'Did the activity gain the benefits for MGA members which justifies the effort - and the cost; your cost?'

An industry association takes on many commitments, which are reflected in the range included in the past month. From representation at the European Mushroom Group meeting, to area meetings, attending the launch of the UK Register of Organic Food Standards, the International Fresh Produce Fair, handling enquiries from most of the one million people who attended the Hyde Park, Celebration of British Food and Farming - well it seemed to us that they all made tracks for our delicious free chestnut mushroom samples!

Add an executive meeting, representations to the government on R & D and to North and Southern Ireland on aid to increasing production, in the face of continuing market oversupply - and it seems that the MGA is right in the centre of activities affecting its members' interests.

The letter from John Callow, commenting on the value of the MGA stand at the International Fresh Produce Fair is encouraging, for it indicates that there was commercial, as well as PR value to gain from that event.

So I must return to the market place. Not because I am trying to bore you by repetition each month, but because it highlights that an industry association does have a responsibility to members who rightly, spend their time growing mushrooms. Most feel that they cannot influence what is happening to their prices - excepting by attention to detail in producing more of the better grades and presenting them

so that customers find them easy to sell and use.

The wholesale market for the first three months of this year shows a minimum increase in volume, of nearly 24% over the same period as last year, with average prices down by over 21%. These figures come from a regular survey of wholesalers handling a high proportion of all market sales - but do not include some new market handlers of mushrooms from Ireland - so the real increase in volume could be higher.

The MGA is arranging a meeting for all N. Ireland growers at the Inn on the Park, Dungannon, 27 June, to discuss the marketing and promotions work. Co-operation and cash will be the message, to build the market and supply it effectively.

Just for a change, and to emphasise the need for action, I can quote Jim Corregan, the live-wire editor of 'Mushroom People' in N. Ireland. He tells me that he has counted orders for several hundred new plastic houses in Ireland. Although I hope that the present market situation will at least delay investment, I believe that some estimates at least confirm Jim's count. Need I say more?

Is there any good news, you must ask? Yes, for we have recently seen the consumption figures for the first three months of 1989. Although they do not match the enormous production expansion, volume sales - at consumer level only - have increased by 15% compared to 1988, for which the housewife paid only 13% more cash. Sorry about the sting in the tail! Prepacks however, substantially outstrip the overall sales increase - buttons and closed cups, up 28%, flat/opens, up a massive 67%, though still only 5%

The Mushroom Journal

JUNE 1989

No. 198

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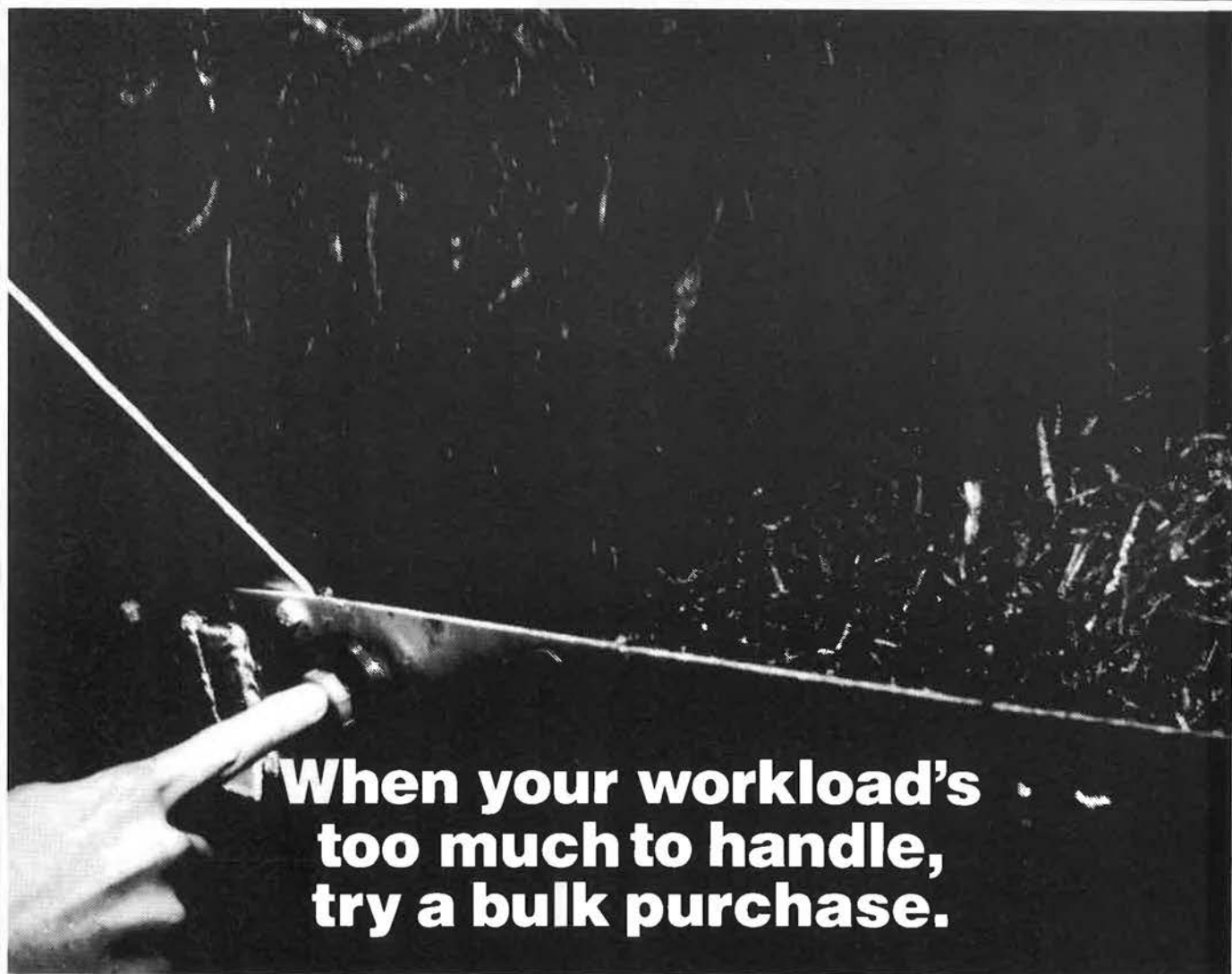
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Articles submitted for inclusion in the Journal are always welcome. Whilst the Editor cannot undertake to publish all the copy received, submissions will be acknowledged. Originals, wherever possible, will be returned to the contributor, who will also be notified as to if and when the article will appear.

No responsibility can be accepted by the Editor, the Editorial Board, or the Mushroom Growers' Association for statements made or views expressed in this journal, or for any advertisements included.

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Annual Conference - York

27 - 29 September 1989

Social Programme for the Ladies

by **Sharon Brook**

Ladies, we have a very interesting and enjoyable day's outing organised for you on Thursday 28 September. Here are the details to whet your appetite.....

At 0930 we will depart by coach from the Viking Hotel en route to the North York Moors National Park. As it will be Autumn, the unspoilt and natural countryside will be beautiful with the heatherclad moorlands. We will pass through many attractive stone built villages such as Sutton-on-Forest, Hutton-le-Hole, as well as Helmsey - a market town known as the gateway to the moors. The group will then be taken for coffee at Danby Lodge which is the official Visitors Centre. This offers a permanent exhibition covering all aspects of the National Park, its geology and history, its wildlife and folklore.

At 1200 the group will depart from Danby en route to the Moor's best known, and most captivating village - Goathland. Here we will have a delicious three course lunch, with wine, in the beautiful ivy clad Mallyan Spout Hotel.

The highlight of the day will be an afternoon visit to one of England's most famous private houses, Castle Howard (setting for the BBC's television series 'Brideshead Revisited'). This features a costume gallery which displays original period costumes said to be Britain's largest privately owned collection, together with architecture which can only be described as monumental grandeur. The house is set in one thousand acres of stunning parkland which houses statues, arbours, fountains and an enormous collection of Rhododendrons, hybrids, shrubs and trees, surrounding a seventy acre lake.

We will arrive back in York at approximately 1700. The cost of the full day's outing is £35.00. Please advise me at your earliest convenience on 01 235 5077 Ext. 363 if you would like to participate in this exciting day's outing.

As an extra, we will be organising a short walking tour of the city of York. On Friday morning, we will depart from the Viking Hotel at 0930. We will walk through the historic streets and alleyways, visit the Undercroft Museum and the magnificent Minster. This walk will take two and a half hours and will include morning coffee and biscuits. Cost will be £5.00.



of total sales.

Our concern must be that lower prices mean lower real margins for customers. We have an exciting product, with a good healthy image. It will be a disaster if we allow the market to slip just because we, as growers, are unable to arrange the flow of mushrooms to continue stimulating demand. One wholesaler who came to the IFPF commented that mushrooms were the only blot on the salad picture in the market that morning. If mushrooms remain difficult to sell and prices are low, because we send too many, our wholesale and other customers, will begin to see them as a nuisance.

The launch of the 'Midsummer Mushrooms' leaflets this month, is just one more element in the MGA's fight to keep thinking positive. The Eastern Area initiative to collaborate and seek additional outlets for mushrooms, must be another positive action.

I suppose that I hope the heading for this month's notes will not just emulate our new poster wording 'Let Your Meals Mushroom', but become all mushroom growers' theme for '89.

European Mushroom Group Meeting

This is an important and twice yearly opportunity for the European mushroom industry to discuss common interests and problems. Pressure on the EEC Commission to improve further the wording of the directive on processing, to exclude anything other than fresh mushrooms from cans, was followed by a proposal to the Commission, that we would trade a zero duty on wild mushroom imports from third countries, for a quota on cultivated mushrooms. Concern that the UK government wanted to extend the list of irradiated fresh products, to include mushrooms, resulted in a further request for pressure on the Commission to leave mushrooms fresh.

To celebrate the tenth anniversary of the Group, it is intended to hold a special reunion in Brussels early in December. This will be an opportunity to look at the whole of the European market, a prospect which the MGA Executive welcomed and agreed to support.

European statistics

Information provided by the delegates, shows that France is by far the largest producer in Europe - at 209 thousand tonnes, with 25% exported in cans. The UK is third largest, after Holland, 120 thousand tonnes, who also imports a further 31,000 of fresh and 7,000 processed. Virtually the whole of their processed production is exported, plus 25% of their fresh mushrooms. Most members are surprised to see that Spain produces 60,000 tonnes per annum, with processed sales as far afield as the USA.

International Fresh Produce Fair

The MGA stand at the Fair created much interest, with a steady flow of visitors and time to discuss requirements and sources. Although all members were given the opportunity to take part, only 11 appeared in a very attractive brochure, so opportunities were missed. Most of the major multiples visited the stand, plus mushroom users, for recipe dishes and a wide range of snacks and salads, with wholesale and retail buyers prominent.

Geoff Capes, 'Europe's strongest man', stopped to tell us that he ate mushrooms raw to combat cramp. Another medical and promotional first!!

Some good contacts and much more information on customers' needs - which are becoming more specific all the time. Thanks are due to many growers who helped during the show and to the two 'chefs', Ben Scrimgeour and Nigel Baddeley. Blue Prince succeeded in providing growing mushrooms which attracted much attention throughout the show and stood up well to the heat and light - many thanks to Brian Cartwright and to Robert Lunn.

The stand has now gone across to Alton Towers as a part of their farming exhibit where Staffordshire grower, David Brammer will keep the mushrooms growing through this year. Alton attracts over one million visitors, so there's plenty of opportunity for mushrooms to attract attention.

Letter to the editor

Dear Ken

I am about to pay you the best £80 of value that I have spent for a long time. I refer to my entry in the Birmingham Food Fair brochure.

As you know we spent some time on the stand and around the fresh and chilled fairs. The contacts we made were good ones, for we felt that we met the right people in the right place. It was really interesting to hear the problems of one of our wholesalers from the managing director, not just the salesman. We put our view to him as well!!

There has been an excellent feed back. In one case we had the spec. for a customer in the office within 20 minutes of making the enquiry, so there is interest in mushrooms, thank goodness.

It seems a great shame that more growers did not take a space, but thank you MGA for arranging the stand.

Yours sincerely

John Callow
Axbridge Mushrooms

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A fresh look at British Food

In January last year, representatives from the mushroom Growers' Association took the initiative and contacted several compatible food associations in order to raise money to fund a recipe and information booklet for British Food and Farming Year, 1989. Individually the Association did not have the funds available to finance a twelve page full colour booklet. Collectively they raised over £20,000 and produced quarter of a million booklets. 'A Fresh Look at British Food' was launched by the Rt. Hon. John McGregor, OBE MP, Minister of Agri-

culture, Fisheries and Food, on the 4th May, at the Hyde Park Show. Copies of the booklet have been sent to over twelve hundred women's magazines and newspapers, television and radio stations.

'A Fresh Look at British Food' provides a selection of recipes involving mushrooms, asparagus, Stilton, bread, trout and poultry. Useful information is provided on the buying, handling and storage of mushrooms and there are also many quick and helpful cooking and serving ideas.

The Mushroom Growers' Association

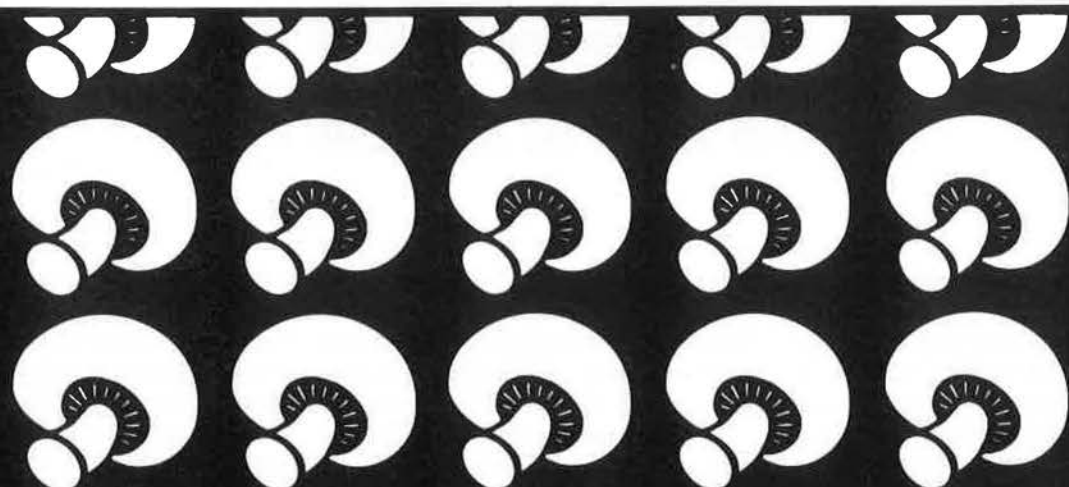
promoted the booklet on their stand at the Hyde Park Show. The MGA will continue to promote it throughout British Food and Farming Year, at agricultural shows, local promotions and cookery demonstrations. Copies of the booklet are available from:-

A Fresh Look At British Food
Agriculture House
Knightsbridge
London SW1X 7NJ

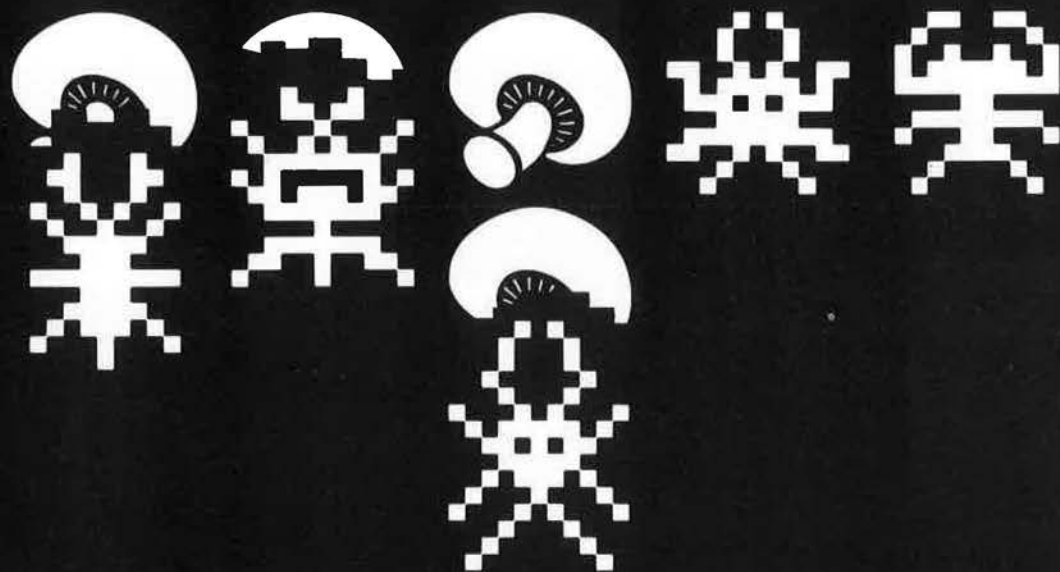
For further information, please contact Victoria Lloyd-Davies/Lucy Unwin, -01 235 5077 ext. 364.



MGA chairman Peter Baker, with Minister of Agriculture the Rt. Hon. John McGregor reading one of the 'Fresh Look at British Foods' booklets of the Hyde Park Show.



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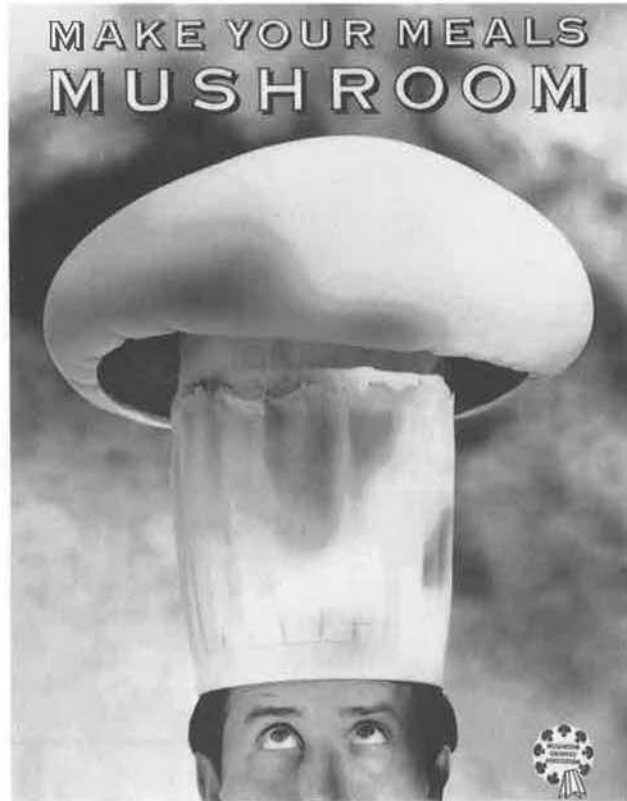
Make a meal of mushrooms

The Second International Fresh Produce Fair at the NEC Birmingham 9 - 11th May was the showcase for the announcement of the Mushroom Growers' Association's advertising and promotional plans for 1989.

The mushroom industry has consistently advertised and promoted mushrooms over the last five years and in the last two years has specifically promoted summer consumption. During this time regular purchasing of fresh mushrooms has continued to rise steadily. The average number of households buying mushrooms in any one month has almost doubled. Over the summer (May-September) of 1988, on average, 44% of UK households purchased mushrooms in any four week period compared with 40% during the same period in 1986. In the peak January sales period in 1989, the purchasing figure reached 50% of all households buying, which represents an additional 600,000 households buying year-on-year. The mushroom market continues to show significant growth with an 11% increase in value year on year.

The 1989 mushroom campaign has three main objectives; to continue the growth in consumption of mushrooms, to continue to support mushroom sales during the summer months and, for the first time ever, to increase the usage of fresh mushrooms in the catering trade, particularly in the pub and small restaurant sector.

In 1983 the mushroom industry launched the animated 'Mushroom Man' television commercial with the now famous 'Make room for the Mushrooms' jingle. Since then, the industry has used television, combined with national poster advertising to highlight ways to bring mushrooms into meals - making room for mushrooms. This year there is a new direction for mushroom advertising; the intention being to position mushrooms as the central part of the meal. In this year's advertising, mushrooms will be projected as the focus of the meal prompting the thought that mushrooms can make any meal more special and more delicious.



The much loved mushroom character has become increasingly more human over the years and will, this year become a real person. A new advertisement featuring a chef wearing a chef's hat, shaped like a mushroom, will appear in a nationwide Adshel poster campaign in July. The 'Mushroom Chef' will be featured on almost 2,000 poster sites strategically positioned in high streets and shopping precincts. The strong banner headline 'Make Your Meals Mushroom' will prompt the British housewife to buy mushrooms on her visit to the shops. The campaign will be funded by the MGA so the advertisements will carry a new logo - a Mushroom Growers' Association rosette.

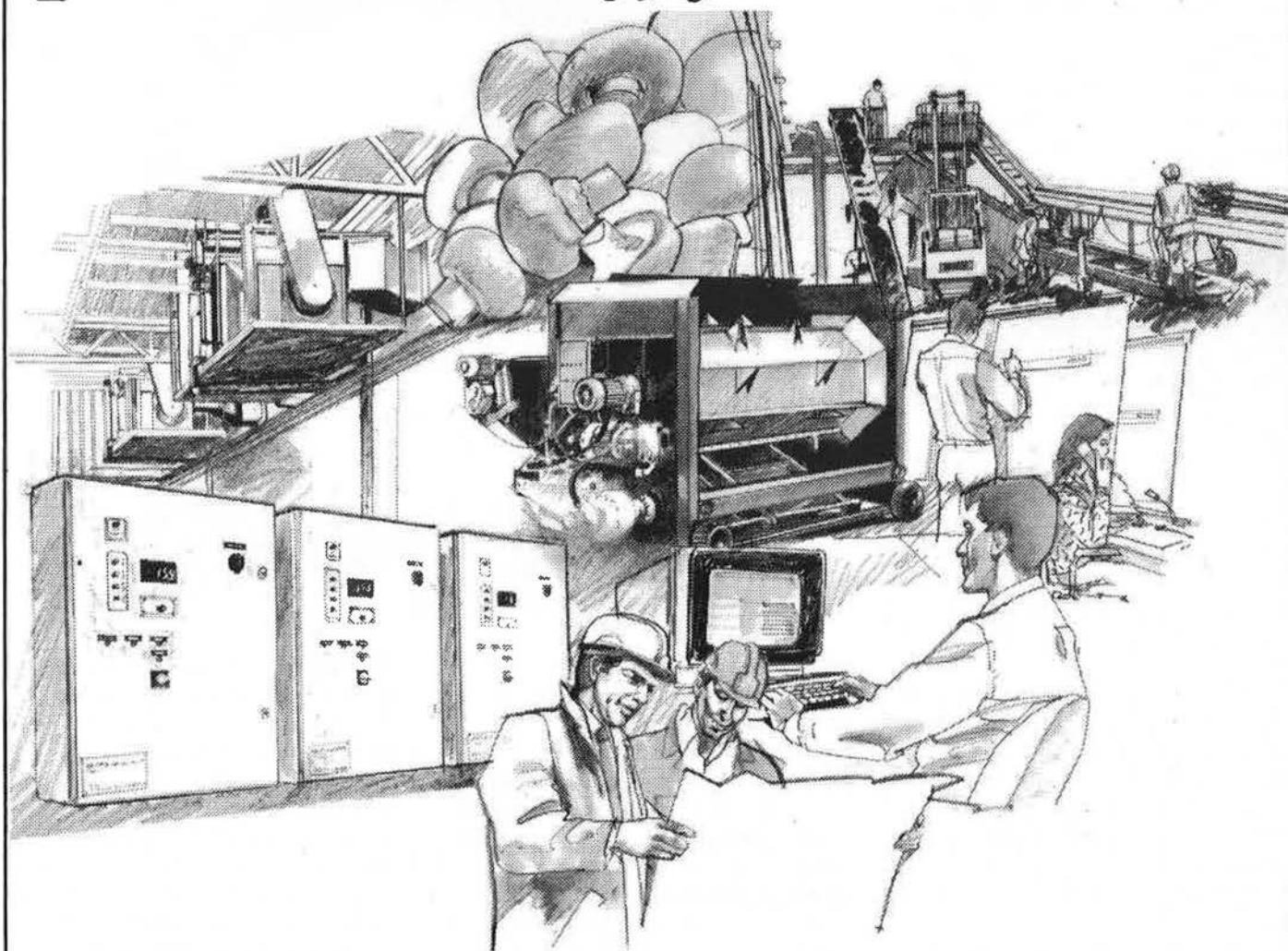
The 'Mushroom Chef' will also be used by the MGA to promote mushrooms in pubs and small restaurants. Full colour and black and white 'Mushroom Chef' advertisements will appear in selected catering publications with supporting editorial features. A new recipe booklet featuring mushroom recipes for hot and

cold starters and main courses will be offered, free, to pubs and restaurants.

The total advertising and promotional package will be supported by a strong marketing programme. A new service was launched to caterers and value-added product manufacturers at the International Fresh Produce Fair. The aim was to offer fresh mushrooms, graded to customers' special requirements. The MGA has a nationwide network of growers, many of whom advertised in a special mushroom brochure at the IFPF. Representatives from the MGA advised potential customers and put them in contact with a mushroom supplier located near to them. A quick and efficient network will enable the mushroom grower to supply the customer with fresh mushrooms, as fast as possible.

Mushrooms are the most valuable horticultural crop produced in the UK. The Mushroom Growers' Association will continue to promote and improve the sales and marketing of fresh mushrooms in this country.

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British Food and Farming Festival

Hyde Park, London, 4th-7th May, 1989

by Lucy Unwin

During 1989, the Royal Agricultural Society of England, is celebrating 150 years of service to agricultural producers and consumers. In addition, 1989 marks the centenary of the creation of the Ministry of Agriculture, Fisheries and Food. This combination of anniversaries called for a special celebration.

The main event of the year was the four day Agricultural Festival, in Hyde Park, sponsored by ASDA. It offered an exceptional opportunity for those involved in the production of food to present a comprehensive display of the nation's most valuable industry.

The Mushroom Growers' Association took part in the Festival and had a stand in one of the Food From Britain Food Halls. On display was an excellent show of mushrooms growing and a superb selection of top quality mushrooms in a

chilled cabinet. A considerable amount of interest was shown. The MGA team and growers worked exceedingly hard giving out the new recipe leaflet 'A Fresh Look at British Foods' and the growing leaflet. The Rt. Hon. John MacGregor launched the new recipe booklet at the MAFF Press Reception on the VIP day, Thursday, 4th of May. The Festival was officially opened by the Queen on that day.

Over 900,000 people visited the Festival with a special day for Inner London Education Authority children. For many, this was their first glimpse of farm life. The beautiful weather drew larger crowds than were expected, helping tremendously with the success of the Festival.

The highlight of the 4-day show was the Great British Breakfast, sponsored by Weetabix. This big charity breakfast, in

aid of Save the Children, raised £10,000 for the organisation, and many food producers provided their products. Fresh mushrooms were supplied, courtesy of Chesswood Produce.

There was a great deal of work involved in the preparation of the MGA stand, and many thanks are due to Gerry and Pam Parker for building the stand, Dennis and Kathleen Watkins for supplying a chilled unit and mushrooms, and Penny Callow, Kath Jones, Peter Bleazard and David Bird for their support and help.

Finally, it was broadcast on the Today Programme, BBC Radio 4, on Saturday, the 6th of May, that a visitor was asked what she had learnt from the show and her answer was...

'Not to peel mushrooms!'



The MGA Executive meeting finished early, to 'give a hand' at the Hyde Park stand - Barry Howes, Dennis Watkins, John Callow, Jim Dumbreck, Gerry Parker and Frank Stewart-Wood in attendance.

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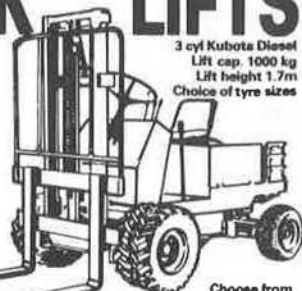


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International Fresh Produce Fair



Prestigious visitor, The Baroness Trumpington, as always showing a keen interest in mushrooms. Chef-grower Ben Scrimgeour - tries hard to look dignified!



As all good chairmen can - Peter Baker achieving a precarious balance.



A happy Lucy Unwin, all her hard work at both exhibitions, has mushroomed beautifully!



An exciting stand generates customer interest. Ken James talks to John and Penny Callow.



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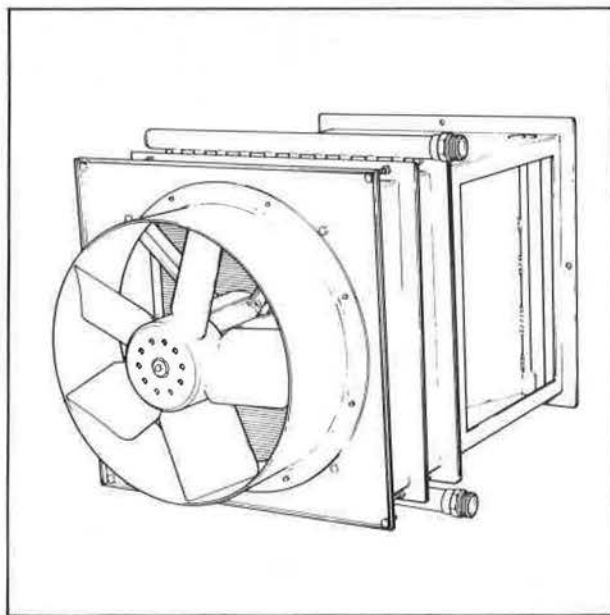
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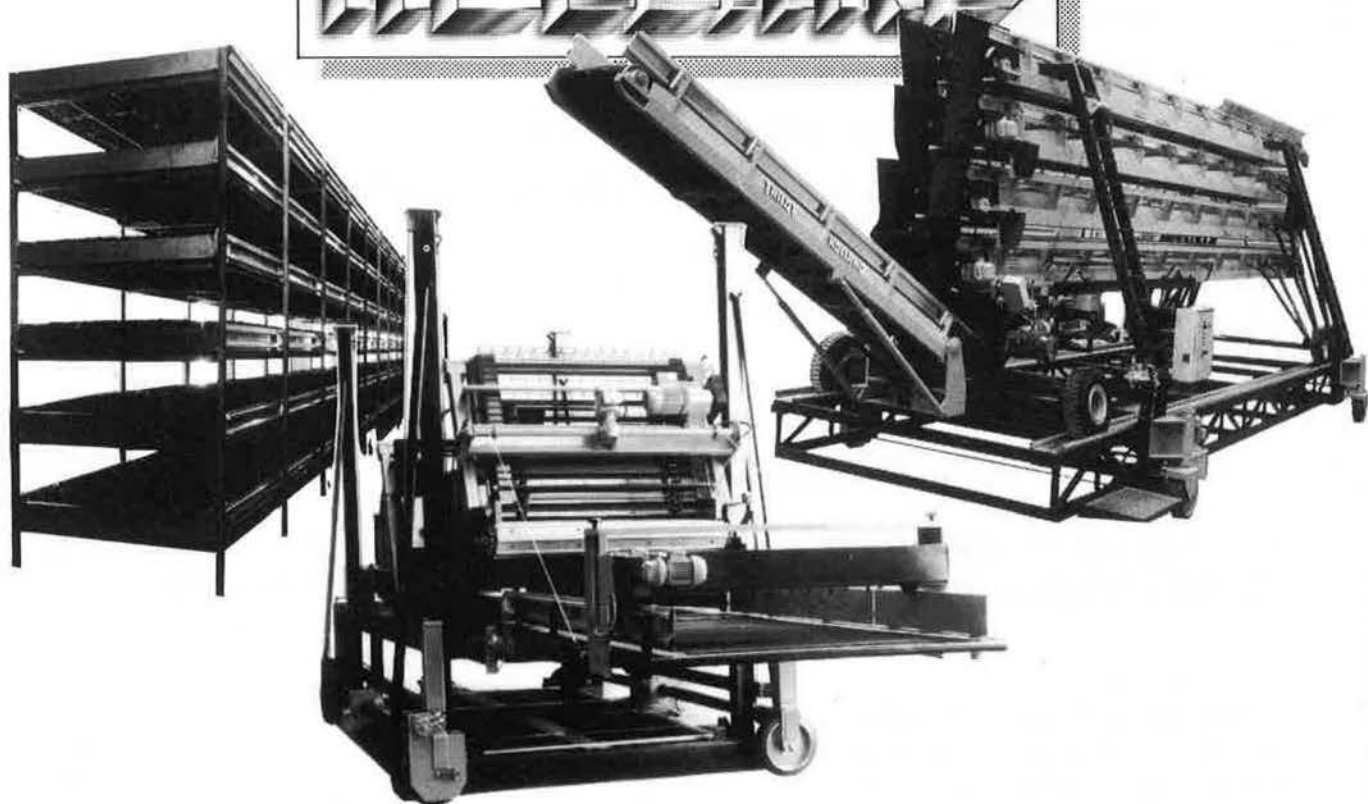


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ISMS International Symposium on Mushroom Biotechnology

Nanjing - China

6 - 10 November 1989

by Sharon Brook



A very exciting seventeen day programme has now been finalised which will incorporate the five day symposium. It is anticipated that a group will depart on Friday, 27 October, 1989, from Gatwick on the world renowned luxury airline Cathay Pacific to spend three nights in exciting Hong Kong. The group will then fly on to China to spend

their time in Beijing, Xi'an and Nanjing, where the Great Wall, Forbidden City and the Terracotta Warriors will all be visited. The group will return to Gatwick on Sunday, 12 November, 1989. Participants may however extend their stay in China or Hong Kong.

A very good package deal which

includes flight, accommodation, transfers full and half board, daily sightseeing, visas, services and taxes etc. has been negotiated. Seats are limited so please telephone me now for more details on 01 - 235 5077 Ext: 363

Please note that the official language of the Symposium will be in English.

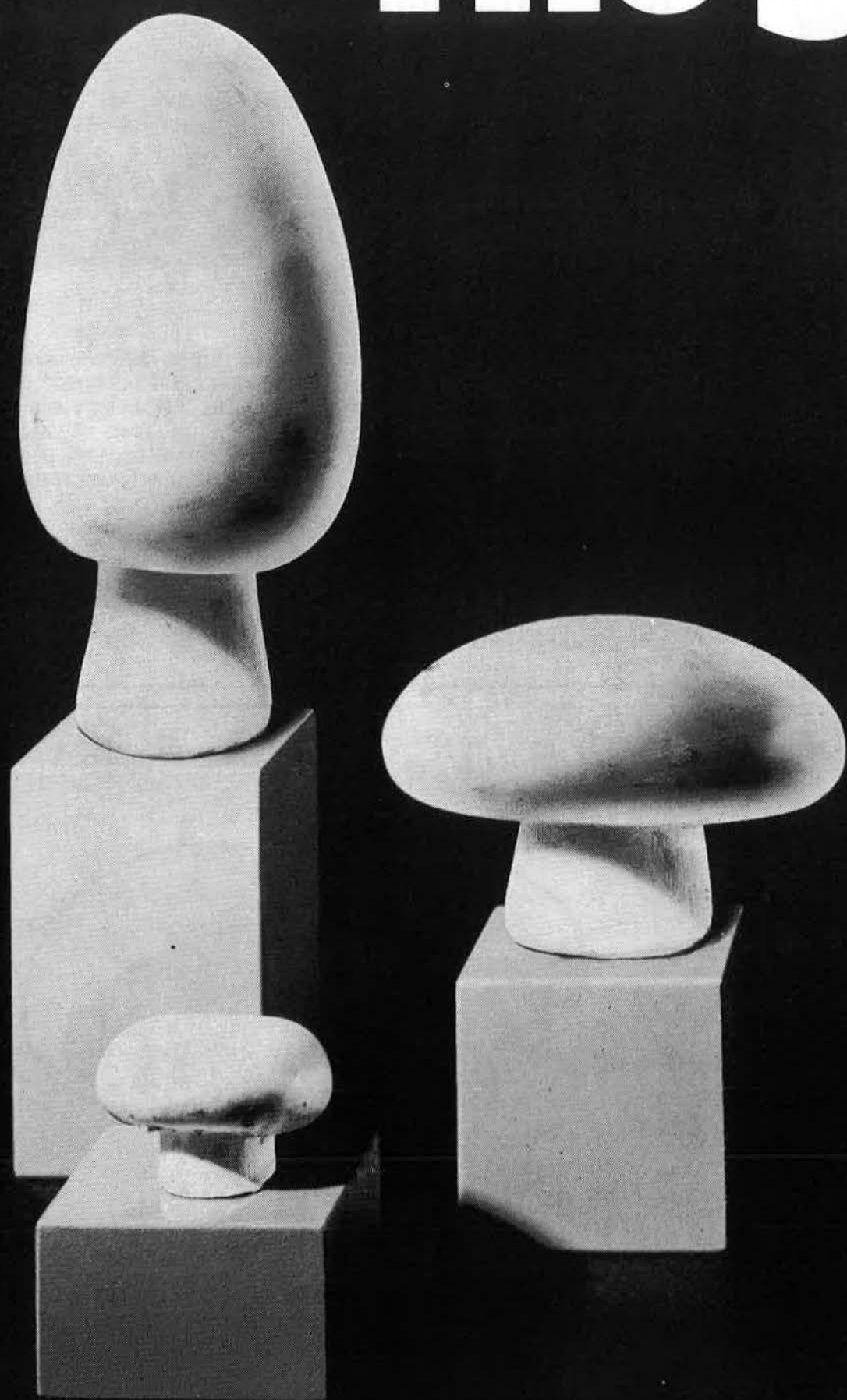
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SEVEN DEADLY NEEDS OF GROWING PAINS**GROWING PAINS**

for many years has given cause for concern but in our experience with the introduction of certain hybrids has caused more economical loss. Arguments as to the major effects being caused by environmental factors or genetic qualities have long been held. In probability certain strains appear to succumb to poor environmental conditions. Our attention has been more closely given in recent years due to our need to supplying pre-packed 'breakfast grade' mushrooms. Poor gills reflect poor quality and low total percentage conversion. An unacceptable factor in the economics of 1989.

Accuracy in mushroom growing is a basic essential for success.

Need for humour

Intensity in producing economic crops of mushrooms has greatly increased in the last fifteen years and it has been too easy to forget the gift of humour. In times of stress 'Humour' is a very necessary part of the management armoury.

5th March '74

Thought we saw a 'streaker' enter the peak-heat room! Must put up notices denoting this is a clean area.

8th May '79

Atkins started his 'Shitake' kit off today, placed the block into a bucket of water - told him they taste like dead newts - he wasn't perturbed only concerned to know if the newts were inebriated or not! Seems little demand for other fungi in UK markets.

31st May '79

Greatly intrigued by advert for a 'Modern Mushroom Farm' which was advertised as a 'golden opportunity to acquire a profitable but not demanding business in glorious countryside!' Jim, we must have it wrong somewhere along the line?

4th December '81

Found John Peaker sitting in the 'Stilton Cheese' pub looking very glum. Found out later he had a severe outbreak of 'Dripping Gill'! Fred Atkins looked up original reference on control, which was based on atomising 4 ozs malt whiskey per 1,000 cubic feet of shed and then to lock the door. (from the inside, of course.) Passed the information on to John who has since perked up considerably.

30th January '82

New moon and the night of the witches should help to solve any current cropping problems: sent people out to look for newts and toads. Annual report of the Mindless Mushroom Institute quotes excellent results if large numbers of these creatures are put into the 'goody' pit water. Spoke to Fred Atkins and he confirmed that he had come across this in the past, but he did admit he had a heavy session the previous night causing him to have some doubts about the newts!!

30th November '82

Talking to a grower's son as to why he wanted to take up mushroom growing and he simply replied, 'To be like dad and sit behind a desk all day signing cheques'!!

20th January '86

Definitions of a Pathologist - 'Someone who lays slabs for the council'. That's worse than the Irishman who went into a massage parlour only to find it was self service.

27th December '86

Intrigued to read of the use of 50 - 50 solution of meths and Dettol for the spot treatment of *Trichoderma*....Hic! Hic! Hic! What lengths some people will go to.

31st January '87

Short 'New Year' message from George Carapiet. 'The worst day's fishing is still better than the best day's working!!' These mushrooms are a bit like fishing, you never do know what you will get George.....

The idea was spawned late one evening 15 years ago in the infamous 'Stilton Cheese' when Fred Atkins persuaded Jim Gooding about the need for such a growers column. Who could do it? As I had consumed a quantity of 'Gin and Tonics', the job was mine. It was January 1974 that the first issue was introduced and except for a brief break has been inflicted on *Journal* readers ever since.

A Mushrooms Grower's Diary - 'Growing Pains'

'The symptoms are many and varied ranging from labour problems, rising costs, material shortages, poor prices and to one's own ability. Remedies are not available from a local GP and have to be learned from endeavour and experience.

On our farms we religiously record important happenings and it occurred to us that a series of jottings of a practical nature may be of interest to other members. We would hope that our 'Growing Pains' will console you in the knowledge that you are not alone and perhaps indicate how anticipation and good observation can help avoid some problems.

Let us proceed

January 1974

Some of the early entries while perhaps not being naive were of little consequence, others still pertain in today's base. Recent years has been aimed at trying to make readers aware that 'Mushroom Growers' world wide have similar problems of culture, management, personnel, production systems, finance, research, and have a need for a sense of humour. I was once asked by an Australian lady 'Are you the poor man with all the problems? Jesus I really feel sorry for you!' Others have simply expressed surprise anyone could be stupid enough to get so many problems.

A great deal of poetic licence has been granted or taken and some random days writing, are blended together as being 'Persistent Growing Pains'.

Need for Accuracy

The need to be more accurate in description was brought clearly home with an early entry indicating that our packing shed had 'Hardgill'. In itself 'Hardgill'



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Need for Research

Our production system has evolved very much from the early commercial research findings of Jim Sinden. Short composting, quick phase II, industrialised large trays, through spawning and grain spawn to mention just a few items.

In more recent years 'Near Market Research' from Holland has greatly influenced us towards changes in casing mixtures, hybrid strains, watering practices and thoughts towards total bulk compost preparation. The mushroom industry in the U.K., is being asked to contribute to such 'New Market Research' or see such work suspended. But for years the separation of Research, Advice, Training and commercial development work has been a source of irritation, and frustration to the commercial mushroom industry. Twenty years ago energetic lobbying had been underway but due to inflexible government systems, and personality clashes the considerable amounts of money were spent with precious few commercially viable results forthcoming. As a vehicle for comment 'Growing Pains' has had its uses, even if no results have been gained.

23rd June '76 referring to a Glasshouse Crops Research Institute Open Day.

Day passed quickly and one departed hoping that the current expenditure of over 130,000 would contribute in some way to assist the ailing UK industry in true commercial terms, as would appear to happen with commercially-influenced research centre at Horst. Little doubt that the mushroom section is large enough to now have its own advisory committee!

27th February '80

Research and Development Committee meeting next week; hope we manage to see a little headway being made. Having sat on the Committee for over thirteen years I can confirm that Research and Development are slow, slow, processes.

10th May '82

Met up with Paul Middlebrook to travel to a combined meeting of ARC, University, and ADAS personnel involved on research and development of mushrooms. General idea being to establish a

closer liaison in order to try to avoid overlap of work and hopefully, for the Research and Development committee to get some say in when projects should draw to a close and new ones commence. The resources of money and manpower involved in direct research to those available for development work appeared to be in excess of 20 to 1!!!

Plenty of talk took place and enough 'gobble-degook' to confuse the most persistent and hardened campaigner for more efficient research and development in the UK. Don't really think we came to any concrete conclusions, certainly no decisions.

Perhaps we were never meant to.....

11th February '87

Paid a visit to the Lee Valley EHS for the first time in four years or so Paul Perrin and Harry Kitchenor told me!! By the depressed state of the Station I imagine it will be the last! How it is expected personnel are able to carry out an experimental programme under such a state of uncertainty I shall never know. Reality and reason certainly don't enter shall never know. Reality and reason certainly don't enter into some of the thinking! Paul Perrin has now accumulated for use in the unit a wide range of equipment and has been trying very hard to present a comprehensive programme. This when one is expected to carry out trials on trays, shelves, troughs, blocks and bags leaves me in total confusion. Surely if there ever is a centralised unit to undertake the needs of the UK industry, now under constant external pressure, someone will have to be bold enough to decide which route it should take? No doubt in the coming weeks, months (more likely years!!) a decision will be taken, which will be a forward step, hopefully for the benefit of the industry! Unfortunately throughout this whole mess no one within the public services has had the guts to listen and take hold of the situation that requires mushroom research, development, advice and training to be under one facility controlled by combined commercial and public service specialised mushroom people. No one can ever say they weren't told, Fred Atkins, Graham Griffiths, Paul Middlebrook, Stanley-Evans family, Harold Linfield, but to mention a few, who have for over 20 years fought hard to influence changes. But others have known better. I wonder

why the UK Horticulture Industry does not compare in so many areas with our overseas competitors? Certainly those involved in daily work, such as Paul Perrin, work with great dedication and deserve all the support they can get. **Please somebody make up their mind before its too late.....**

1st September '88

'The best person to decide what research shall be done is the man who is doing the research. The next best is the head of the Department. After that you leave the field of best persons and meet increasingly worse groups. The first of these is the research director, who is probably wrong more than half the time. Finally there is a committee of Company vice-presidents, which is wrong all the time.'

Need for no Chemicals

Over the years the role of chemicals in the production of mushrooms has come under closer scrutiny. The 'Organic mushroom' maybe a dream, but is it that far from reality if farm design, knowledge and personnel training applied to the problem? It is obvious that many past practices employed in the mushroom industry will not be permitted in the future.

31st July '79

Long discussion on the best chemicals to use for spraying out crops and washing around the farms. Not only do we have to consider toxicity and pollution - but how effective are they in practice? Putting a collection of spores in an *in-vitro* test will give 100% kill with many chemicals - but what happens with the old debris and dust around the mushroom farm? How often do we add spreaders when we know that dust is a great problem to wet. Formaldehyde is cheap and created a great 'fug' of fumes - but is it as effective as we imagine? Decided to try cresylic acid!

Any help would be appreciated.....

2nd May '82

Discussing pesticide shortages with Phil White GCRI and with the cessation of Nogos manufacture, he agreed it might be time to increase activity in the biological control field. Certainly in an enclosed environment in mushroom sheds lend themselves to biological control. Joe

The growing voice of opinion



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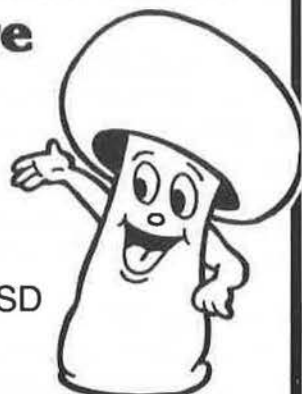
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Comment January '88

Hygiene standards vary enormously from mushroom farm to mushroom farm yet the principles of creating clean and protective areas from basics. Being simply clean and tidy is only part of sound husbandry practice. Flooding areas with chemicals will not necessarily protect crops from re-infection. Sound aftercrop sterilization has to be of major importance with the level and time heaped for routine or a specific problem of necessity. The grower has to identify his 'foe' on an individual shed basis. How often do you stand looking at old crops being emptied? Much can be learnt. Our practice is never to empty uncooked trays as re-contamination with moulds we wish to avoid. Other do not do this. Fred Hayes tells me there is more interest in using methyl bromide for after crop sterilization to save on tray and building damage. But whatever the system, it has to be based on sound practice and be monitored.

From starting clean with the growing container, farm and shed hygiene has to be absolute. The use of copious quantities of pressure water to clean and mild disinfectants will achieve this. But in order to prevent virus, flies of fungal pathogens farm design, filters fly screens and physical preventive barriers are essential.

The safe minimal use of chemicals will become essential practice in the future.

11th November '88

Environmentally in coming years the question of smells, chemicals or pollution will, without doubt, simply not be accepted from a mushroom production Company. Often in this column reference has been made to establishing 'hygiene programmes' with minimal chemical usage and those that are used to be far less noxious.

Suggestions of Ministry guidance in formulating such programmes for mushroom farms has drawn no response.

A very sobering experience is to take series of black and white photographs looking from the outside into the premises called a 'mushroom business'. Those unsavoury corners quickly catch the eye, as they do to the passers by! The camera does not lie and as an industry

some more landscape application could be employed to good effect so lifting the image of the 'mushroom business'.

7th February '89

Requirements by Supermarkets for chemical analyses of product is now with us and the use of blind as well as selected tests will be the way of spot assessing specifically quoted chemicals and their levels. These days I am unsure on E.E.C., regulations concerning the use of all chemicals permitted in mushroom growing and whether those chemicals are permissible in all individual member countries.

Certain anomalies used to occur, maybe they still do. As one who is emphatically in favour of hygiene preventative measures, whilst realising that there are certain areas of conflict to this. I welcome less and not more chemical use. The problem of course is people, people not doing as they should. This was clearly shown today at the Yaxley farm where selected trays for 'spawned casing materials were taken out of the clean zone and stood outside in the open!' Why? 'Oh, so we could get to the stuff at the back of the shed Gov'nor'.

Reminds me of many years ago when Peter Stanley-Evans was trying to explain to his staff what dirty air way in terms of being full of minute spores. If spores were only like footballs.....

Need for Control

Disease problems are never far away from any commercial mushroom producer and these often occur if not monthly, never had such outbreaks, but if you have, then there is a need to discuss fully the implications of how both to *avoid* and *control* them.

Bacterial Blotch

5th February '76

Have looked at 'Blotch' problems again. Note where pickers have been sweeping dry floors that blotch seems more prevalent on the edges of the two lower layers. Have introduced watering the floor with chlorinated water 200 ppm prior to sweeping. After a lengthy searching, found chlorine tablets that can be dropped into a gallon of water to give 200 ppm - very simple. Continual water-

ing with chlorine appears to reduce blotch, but have been concerned as to a build-up of conductivity during the last two weeks and possible yield reduction. Will write to GCRI about it.

1st March '81

Back to water chlorination for 'Blotch' in hope of trying to reduce the incidence. Surprising that at the same levels of concentration some strains appear to mark more easily. Can only conclude that there is variation in strain sensitivity and perhaps we need to vary 'p.p.m.' used for different strains or different flushes. Certainly need a more accurate measurement to ascertain the levels of chlorine present at application.

6th December '85

Bacterial blotch problems re-occurring far too frequently and one has to wonder at times about the possible build up of infectiously high levels of bacteria in farm water supplies. Maybe in tanks used for storage or even bore hole supplies. No doubt in my own mind that one levels of 'blotch' are high on a farm, spread from crop to crop is similar to Verticillium disease and infection can be endemic.

2nd January '86

Effect of individual strains on Bacterial Blotch damage levels appears to be more significant than one might think, or may be it is the strains individual requirements in terms of water levels that has the main effect?

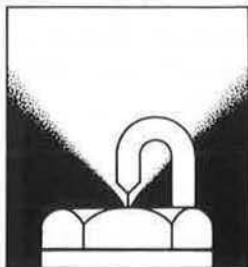
Fluctuating environmental conditions will undoubtedly give rise to blotch symptoms as will variations in casing moisture levels. Perhaps the improvements being made within the industry with greater use of a closely controlled environment is having an effect; certainly less is talked about Blotch outbreaks!

4th January '87

'Blotch' re-appearing which with extreme cold outside could be considered surprising! Yet by opening a door the cold air entering the shed will change the mushrooms' temperature in a very short time. There is nothing like environmental variations to cause 'blotch' as Jim Sinden pointed out many years ago. A clear pattern could be seen along the bot-

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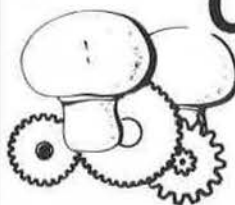
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tom trays where the cold air passed rapidly over the mushrooms.

Virus

29th January '80

Had a telephone call asking about early symptoms of virus (or is it back to La France disease?). Whatever you call the problem (and it is pathogenic) it should be dealt with in a thoroughly professional way. Never hesitate to ask for help or clarification on certain points from those who know. Earliest symptoms, seen on generally very good first flushes, are single grey or off-coloured mushrooms in clumps; this symptom is not often recognised by growers. Some weeks later the more typical symptoms of leggy mushrooms, german helmets, stringy mycelium, die-back in the casing, patchy zonations in early breaks and a general reduction in yield. Some would say symptoms of a poor compost! At any rate, it would be time to quickly get samples to ADAS for electron microscope tests - which are the only reliable practical test, although even a negative could be misleading.

13th September '82

Routine Virus tests came back negative. Been thinking about some of these new strains which have an off-white tendency and if they would be tolerant to virus-type symptoms. Practice of having a complete break of strains is interesting in that may be a farm does become 'strain-sick'. Continual use of the same strain bringing about a type of hidden malaise! Probably nothing in it, but it just makes for a discussion.

28th February '86

Virus appears to be one the increase, which in itself is an alarming situation, as is the thought of a massive load of spores in the environment! But why on the increase? Have growers relaxed their hygiene programme because of the costs? Has compost selectivity caused a triggering of latent virus? Is the increase in open sales giving more spore contamination? Are old buildings being knocked about releasing years of stored problems? Are we importing infected spores? Have cultural techniques been changed to cause a move in standards in crop safety? A need for discussion between growers.....

Verticillium

27th April '76

Played hell with the staff for not emptying stalks daily and keeping bins clean. Tried to explain that even apparently healthy stalks could have *Verticillium* or *Mycogone* spores present if there was infection on the beds. A rotting mash of mushroom tissue would be ideal in spreading spores all over the place, let alone attracting 'flies'.

19th July '79

Received number of telephone calls from growers concerned about the movement of *Verticillium* infection from later infection to the first flush. Must admit we have found pieces appearing in the first flush and having tightened up hygiene, have wondered about contamination of the raw materials. Could it be a possibility?

3rd April '86

Sudden increase in *Verticillium* is related straight back to hygiene being by-passed, 'because someone knew better'? Why do people seem unable to follow a proven system and gradually move the parameters to where they think they should be? When you stand where showing them where they have gone wrong the old excuses, well it was Joe, Bill or Sid who charged it? So you start again, write it down, start a book or display a notice or two notices - but where is the faith! Trying to explain why microscopic particles are so dangerous when they are not visible is by no means the easiest task. Yet in the absence of a safe chemical control this is where the battle has to take place. You have to break the re-infection cycle and I can see why some growers used to completely run all the crops out for a short period in the summer. Economics have now changed!

23rd February '87

How does *Verticillium* suddenly appear in a crop on a farm where there previously was none? Yes, it could have blown in or some dust or soil that was accidentally introduced? Yet could it be part of a natural infection that lies dormant until its latency is triggered by some unknown factor. Never ever really believed all the epidemiology of the pathogens is fully understood.

Need for excellence

Casing I suppose of all the cultural aspects is the item most frequently referred to due to our insistence to strive for 'Excellence of Product'. How is that so involved with casing? Can one say the blend of peats, limes, density, mycelial retention, water holding capacity and gaseous exchange control the quality any one strain may reach.

The Casings's role in quality

7th March '80

New casing mixing machine producing a mix nearly similar to hand mixing, but with more water in. Still not sure if we can achieve immediate application or if we should let the mix stand for 48 hours before application. Real trouble is that the peat is just too fine. The mix is still too light for good mycelium growth and we must increase the water level.

9th November '82

Effect of casing mixing machinery on the end product and total yield is more pronounced than might be imagined. Certainly any trial work on different types of casing materials should be carried out with this in mind, by attempting to mix under various commercial conditions. A certain mixture that seemed a loser under one set of circumstances may not be so with a different blending machine.

Two methods, mixing and blending!

28th April '86

Mixing unlike ingredients together can be most difficult and if not initially done thoroughly the degree of separation both physically and chemically will remain. Then the moisture levels will be variable as will the water retention. Also the levels of nutrition and sanitation may not be all in the range that is acceptable. The problem could be in variance of density and not gaining good mixing by reaching a state that causes physical damage.

2nd July '87

Casing panning due to batches of finer peat being delivered or if not that, something we have inadvertently changed in our handling procedure. It is quite amazing how observant key people require to

be to identify changes in laid down procedures. *Creeping Variance*. Carefully defined weighing systems to ensure correct densities can be used but at times may, due to a shift in the material make up patterns become variable rather than due to moisture holding capacities. Double check systems are a necessity.

10th July '87

Small mushrooms on third flush revealed too shallow a casing layer and a clear example of COC (Cocked up Quality Control!). As George Carapiet constantly told me. 'Check the Checker'.

6th March '88

Discussing peat in all its various aspects is without doubt a complex subject. White or Black! Fine or Coarse! Dense or Light! With Free or Locked Water! Sedge or Sphagnum! Baled or Bulk! Clean or Dirty! Expensive or Expensiver! How to mix it? Better still how to mix it without grinding down the structure! Or with even amounts of water and an even pH distribution. Mix and apply or mix store and apply? How can so many permutations occur? Subject for a day's conference similar to the recent ADAS event at Harrogate. Have not seen that Conference written up as yet, no doubt the Journal will publish an article! Now we have the advent of ready prepared casing! With all the problems and complications that go into centralised preparation, problems are widely distributed and far reaching!

Excellence of Product

Quality is related not only to casing but many, many other factors, even though we feel casing to be extremely important. In the last few years 'Quality' is the word more frequently used in 'Growing Pains'. Quality in the market place, in the workplace, in material control, in fact everywhere.

7th June '80

Mushrooms too damp for picking resulting in much enzyme marking or bruising where they have been held during the harvesting operation.

10th August '86

Quality, quality, quality!! Individual quest for continuity of supply of top quality mushrooms has become more and more paramount. Yet how do you

achieve it? As it basically boils down to 'People Producing Premier Products', you could rightly argue once a quality production system is installed on a farm, if it fails, it is a People Problem. Then what's new! But as a grower was explaining to me recently, 'How or what is a good quality production system?'.

Comment '87

Bob Bellman writing in the American Mushroom News makes a very profound statement: 'In my opinion, growers need to change some of their attitudes regarding quality. They need to be willing to make some changes and institute concerted efforts to achieve better quality - Not just talk about it! This may require some sacrifice in yield, for example. Considerable research with other crops, for example most fruits, has clearly demonstrated that overcrowding reduces quality. There is always a point of diminishing return. We probably have reached that point with mushrooms. Emphasis must now be on growing for quality with the best yield that can be achieved under such conditions. This will be a great challenge for everyone. Always remember top quality today may be the norm for tomorrow. Standards never come down and customers' demands will be ever upwards'.

Is the problem of quality in the cultural system? When one sees over-pinning of soft mushrooms under the peaty casing layer the answer must be yes! When one sees the clumping and clustering of square mushrooms the answer must be yes! But when one opens the shed door to see shelves full of individually spaced, evenly symmetrical mushrooms the answer must be no! Where are the differences in technique? Are the realities of strain, compost, moisture, stress and casing layer in relation to one another not fully understood? The individual manipulation of all these areas are mainly still very much in the hands of the personal growing techniques of the producer. Probably it will remain this way for many years to come or is it likely computer control will make those skills of 'Anticipation' redundant?

31st May '88

Effect of poor harvesting practices not just on quality and presentation but actual crop conditions cannot be overstated. It is a continual battle trying to ensure

supervisory personnel communicate what it requires back to the picking force. Don't cut the stalks too short; or too long; keep the mushrooms clean; stop picking mushrooms too small; who told you to climb on the beds; never touch diseased mushroom; why did you throw those mushrooms away; how did you manage to pull the casing away from the bed; what is making the caps pull away from the stalks; can't you tell closed cups from open cups; and so on and so on. Now with-standing the problems of getting enough people to harvest the crop, the demands on quality add extra pressures to reach these required standards. It will be the major factor affecting mushroom products in coming years.

Need for people control

People make a Mushroom Business progress or fail. Management may guide, train, encourage and take discussion, people do. Any breakdown in communicating these factors to the work force will result in a 'People Problem' operations will become inefficient, slovenly and open to outside factors. In recent years awareness to the importance of this has led to greater stress on the need for Excellence in Management.

8th April '85

Growers not recording what is important! Yes, what is the daily routine programme, but also what is at variance. Casing too wet/dry; deep/shallow; compost long/short; wet/dry/ spawn run slow/quick/ type of colour and all the other most vitally important issues that at a later date may help us tell us why a crop was poor or good. We all know it is Tuesday 9th April and 7.30 a.m., well most of us.....

5th December '86

Process control is becoming more and more critical with the customer awareness of quality. Individuals' interpretation of 'control' and 'quality' and their own way of achieving the same is very varied. Training in such techniques is left virtually to a one to one situation which is questionable in terms of future expansion of trained people. Greatly intrigued in a term I noticed in the AMI's Mushroom News from the May issue. Reference to 'Staff Creep' contrary to anticipation this relates to the

'increase in staff exceeding the proportional increase in production'.

1st February '87

Remember the basic responsibility of a supervisor is to motivate the direct production. An 'easy' supervisor (one who just wants to get along with people) can find they have a low level of productivity in their section. On the other hand a supervisor who sets exacting personnel standards should have no trouble motivating staff to a higher level of production. A case for selection.....

Comments from '87

- A year that has in the minimum been eventful and in the maximum one we could do without!
- Creeping Variance.*
- Who checks the checker.*
- If we do not learn by our mistakes, why do we make them?*
- Complacency Syndrome.*
- Central essence of understanding.*
- Not just talk about it!*
- Discussing personnel accountability.*
- The obvious is avoidable if it is observed.*
- Standards have fallen.*
- It's a people problem.*

New Years Day 1988

Formulated plan for a year with Zero Defect - based on removing all the

people!

Outside People

Acceptance of the obvious can result from being too close to daily line management, not questioning closely enough and not using outside eyes. Everyone in a daily routine of growing needs to be able to draw himself away to see the obvious.

17th June '76

It is amazing how you can sometimes miss the obvious by being too close to the day-to-day running of the farm. Found some saprophytic eelworms present in several houses and on checking back these could possibly be linked to some uneven peak-heat temperatures back in April. Must look very closely at this in future. Certainly seems to be a link up with red pepper mites. Botrytis mould and saprophytic eelworms!

31st July '82

Debated how useful are consultants on a mushroom farm which, of course, depends how, when and what you might want to use them for. Never is it possible for any person to come to your farm in a single visit and tell you how to grow your mushroom crops; this is a daily decision-making requirement. As a 'diagnoser or trouble shooter' an outsider can often see the obvious and create an atmosphere

where personnel on the farm are receptive and questioning over the problems they think they have. Aid in putting over a new technique that is viewed with some misgivings by established staff around, is often gained if put forward from outside the farm. When planning an external appraisal of the finalized production it generally raises items that have been forgotten or wrongly appreciated. Someone asked once about selecting key personnel and having an outsider sitting in on the interview. Not really sure about this one as in a small industry personalities are known to many.

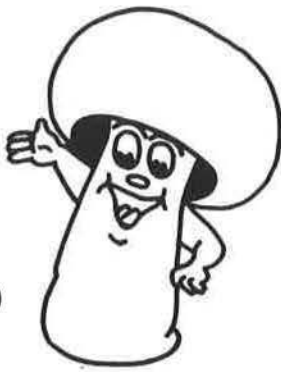
July '87

Outside eyes are extremely useful in terms a likely question as to 'Why' or 'Where' or 'What' do you do that for? 'The obvious is avoidable if it is observed'. Hugh Barton always used to advocate to get an honest friend to walk your farm if you want to know where changes have taken place in your standards. Then you have to be honest with yourself in deciding that the standards have fallen.....
This Paper was presented at the 5th South African Mushroom Farmers Conference 15th May 1989 and my sincere thanks go to their organising committee for their invitation to speak and to all their members for their generous hospitality.
Geoff Ganney

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Peter Stanley-Evans

After a long drive South culminating in a short spell through the plush countryside of stockbroker Surrey, I arrived at what must be one of the world's more unusual mushroom establishments, an operation which focusses on the cultivation of large (4" across) flat mushrooms of pink-gilled freshness. This operation is necessarily conducted with fastidious attention to detail and hygiene.

Many growers throughout the world will immediately recognise/equate this description with Shackleford Mushrooms, home of Peter Stanley-Evans, founder and Chairman of the company and Chairman of our Association in 1960.

Over dinner that evening, I had opportunity to learn of Shackleford's evolution and Peter's thoughts on the future of our industry.

After the war, mushroom cultivation offered a fascination to Peter and seemed a natural enough extension to his love of horticulture, principally cut flowers. With the advent of son David into the business, Shackleford Nurseries became Shackleford Mushrooms and Peter's beloved chrysanthemums went out with the glass. This was in 1969.

I suppose most conventional growers are bound to wonder why, in those early unfiltered years, a man would put his neck on the block to the extent Peter did with such an apparently high-risk strategy of growing opens.

'Quite simple' Peter replies, 'the market wanted them'.

If one stops to consider the production-orientated basis of the mushroom industry until, say, the late seventies, the originality and forwardness of Peter's concept was unusual to say the least. Indeed, his attention to marketing matters led him to rail against Covent Garden's decision in 1964 to impose a five day week. As he wrote in *The Grower*: '...the facts in this case are that it is against the interests of millions of housewives who will have to make do with produce which is past its best...mushroom growers are going to be hit harder than anyone else



because their product is more perishable...to disrupt our industry, which will soon be the most valuable protected crop in the country, is to invite imports...we are mugs not to opt for a grower-controlled system modelled on the continental clock auctions.'

Peter's forward-thinking further manifested itself in his appreciation of the need for operating-theatre hygiene at a time when mushroom growers were quite literally in the dark about many cultural aspects. It is certainly his opinion that lack of knowledge on the causes of La France disease/die-back/virus transfer was possibly the greatest hindrance to uniform cropping.

Nowadays, Peter undoubtedly frets at the time taken up in dealing with the matters non - mushroom. His target is currently directed at the environmental constraints increasingly being imposed on mushroom farms in a suburbanite society. Nevertheless, Shackleford continues to develop and, once again, 'we

have stuck our necks right out and are in the process of completely streamlining-modernising our operation.'

But let me leave you with another delightful quotation from one of a series of articles Peter wrote for *The Grower* in the Sixties:

'I have always thought that, to the uninitiated, one of the oddest sights in the world must surely be an enthusiastic mushroom grower taking large double handfuls of horse droppings and urine mixed with straw and liberally laced with chicken manure into which he proceeds to thrust his nose, taking deep draughts as if of some delectable nectar and completing this peculiar ritual by squeezing the steaming mess until it exudes manure water between his fingers which then engenders an expression of complete satisfaction on his face.' - the words of a connoisseur.

Charles Spencer

The Influence of Ammonia on the Growth and Quality of Mushrooms

by J.P.G. Gerrits and L.J. van der Eerden, Mushroom Research Station, Horst and IPO Wageningen, Holland. Reprinted with permission from De Champignon Cultuur.

The fact that air pollution can have a negative effect on plants is generally known. The direct damage to Dutch horticultural production has been estimated at about 600 million Guilders per annum (Van Eerden *et al*, 1988). This damage is primarily caused by three components: ozone, sulphur dioxide and hydrogen fluoride. The fact that ammonia is not included in the 'top three' requires some explanation. Ammonia is represented as one of the biggest villains in the press, on the radio and on television whenever acid rain, dying woodlands and grassing on moorland are discussed.

Ammonia produces three different effects: it is a nitrogen fertiliser, it acidifies the land and increases the sensitivity of plants to frost, drought, diseases and infestation (Dueck *et al*, 1988). It could well be that it has a positive effect on horticulture, provided that the effects of 'free' nitrogen fertilisation outweigh the negative effects of land acidification (which the farmer must compensate with lime) and of increased 'stress sensitivity'.

The effect on woods, moors, peat bogs and other (semi) natural poor vegetation is quite different. There free nitrogen fertilisation is in general unwanted. It disturbs the nutritional balance, causes the plants to suffer from a shortage of other nutrients and making them more stress sensitive. In turn, this upsets the competitive balance between species.

In recent years, many indications have also been found to confirm that air pollution (including ammonia) plays an important part in the increasing rarity of many toadstools. Some mycorrhiza forming toadstools have been found to be extremely sensitive to ammonia, and can therefore play an important indicating role. The fact that the chanterelle is now becoming rarer has probably got a lot to do with air pollution (although that may not be the only cause).

There are two reasons for wishing to know whether mushrooms are also sensi-

tive to ammonia:

- In pasteurising compost, a great deal of ammonia is released. In the event of leaks or faulty air supply from an adjacent room ammonia laden air can be fed to cropping rooms where mushrooms are growing, and cause damage.

- Every now and again, there are complaints about reduced mushroom growth and quality following the spraying of slurry on nearby fields. Ammonia is the prime suspect. This is why mushroom growers frequently object to the granting of licenses for intensive animal rearing ventures in close proximity to their businesses.

A study was carried out in 1987 in order to assess the possible effects of ammonia on mushroom growth. The results are given in this article.

Experiment

On 25th February, 20 trays, each having an area of 0.2m², were filled with 22 kg fresh compost from the CNC (Experimental Dutch Mushroom Growers' Association). This was peak heated in the normal way and the trays were inoculated on the 5th March with the strain Horst U1. They were cased on the 20th March. As soon as the pinheads had grown to the size of peas, the trays were taken to Wageningen. That was on the 6th April. They were then exposed to 5 different concentrations of ammonia for 3 days at the IPO (Research Institute for

Plant Protection) (four trays per concentration). On the 9th April, the trays were returned to the Experimental Station in Horst.

The ammonia (NH₃) concentrations were 5.4, 2.7, 0.5, and 0.18 mg/m³. The concentration in the control was less than 0.03 mg/m³.

The conditions in the gas cells were held constant at: relative humidity: 90 - 95%, temperature: 19.7 - 20.2°C, air speed: 1.0 m.sec⁻¹, CO₂ concentration: 330 - 360 p.p.m.

The gas exposure took place during the pinheading phase. Back at the Experimental Station, cultivation progressed normally, and the mushrooms were harvested over a five week period.

The pH of the casing soil was measured before and after exposure to the gas.

Both the yield in kg/m² and the number of fruit bodies produced in each tray were measured. The unit weights were calculated from these measurements. During the first break, mushrooms were taken from each tray, dried and sent to the IPO. There, they were assayed for their Ca, Mg, K, P, and N content.

Also shown is the effect on the dry matter and calcium content of mushrooms of the first break. The standard deviation (s.d.) for each group of measurements is given at the bottom of the table (n = 4).

Table 1. The effects on mushroom yield (kg/m²), numbers (number per m²) and unit weight of three days exposure to ammonia.

%NH ₃ in mg/m ³	Yield kg/m ²	Number per m ²	Unit weight (grams)	%Dry Matter mushroom	Ca content in mg/g ⁻¹
0.03	26.0	1159	22.4	7.7	0.50
0.18	24.9	1321	18.8	7.6	0.52
0.50	26.6	1504	17.7	7.9	0.62
2.70	26.5	1434	18.5	8.3	0.70
5.40	25.7	1326	19.4	8.0	0.94
s.d ±	1.6	277	3.2	0.3	0.11

Results

Directly after gas exposure, it was found that the pinheads exposed to the highest concentration of gas (5.4 mg/m^3) showed some brown discolouration. After a few days, this had disappeared. The pH of the casing soil was not affected by the gas. This is not surprising, remembering that casing soil is heavily buffered with sugar beet factory wash lime (calcium carbonate).

It may be seen from Table 1 that exposure to the gas had no effect on yield, the number of mushrooms per square metre or on the unit weight. After one week, it was still possible to see some effect on the trays that had been exposed to the highest concentrations of ammonia. The number of mushrooms was less than in the other four sets and the yield was about 2 kg/m^2 less. This was compensated for in the later breaks.

The dry matter content of the mushrooms increased with the increase in exposure to ammonia, with a maximum at the highest but one concentration. The calcium content of the mushroom also increased significantly with exposure to the gas. The N, P, K and Mg contents were not affected.

Discussion of the results

At the highest ammonia concentration (5.4 mg/m^3) there was some visible dam-

age. The pinheads were slightly discoloured brown. The discolouration disappeared after a few days.

In addition, it appeared from the number of mushrooms harvested in the first week, that pinheading was negatively influenced by exposure to the highest ammonia concentration. This effect was compensated for in the subsequent weeks: the following breaks yielded more fruit bodies. The total yield was not affected even by the highest ammonia concentration.

No explanation has been found for the increase in dry matter and calcium.

Ammonia concentrations produced by pig units or hen batteries, or resulting from slurry spraying, seldom reach 0.5 mg/m^3 and even then only for short periods. It would thus seem most unlikely that intensive animal rearing or a slurry covered field pose any danger to the quality or yield of mushrooms.

Airborne ammonia concentrations in rooms where compost is being peak-heated can be much higher. If this air gets into a room where fruit bodies are developing, (via leaks in the room walls for instance), it is risky.

Even so, it is doubtful if concentrations of 5 mg/m^3 would be maintained for days on end, since the mushroom grower would take care to deal with any such leaks as soon as they occurred.

Summary

Trays of mushrooms were exposed to air containing various concentrations of ammonia for three days during pinheading. Some brown discolouration and a temporary delay in production were seen only at the highest concentration (5.4 mg/m^3).

Comparable high ammonia concentrations will not be seen in a production room, so that it is unlikely that ammonia damage will be seen in mushroom cultivation.

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International Report

Mushroom supplement from down- under

The use of milk whey, a waste product from the production of cheese is again in the news in connection with the production of mushrooms. Dr Yip Cho, Senior Lecturer in microbiology at Sydney University, and his team of scientists have developed a new mushroom supplement derived from whey.

In producing cheese, milk is clotted and when the curds have been separated off the remaining liquid is whey. It is mostly water, but contains around 1% protein and 4 to 5% of milk sugar, lactose. To develop the supplement, Dr Cho's team removed the protein from the whey and

then grew yeast on the lactose solution remaining. The yeast cells were separated off and dried. Yields of mushrooms grown on compost supplement with the yeast product are claimed to be up by 30%.

Not only may the mushroom benefit, but the process could help to improve the environment as well. Whey is a waste product from milk processing which may often find its way into ditches and streams causing pollution. Using whey to produce a mushroom supplement could help to reduce pollution of water ways and one milk processing factory is believed to be

considering setting up a plant to produce mushroom supplement from their milk waste.

Among earlier examples of the use of milk whey in mushroom growing are Dr Stoller's experiments with it as a source of carbon in composts in the 1940s and, more recently, in the development of rapid mushroom composts by Jeff Smith of IHR, Littlehampton, in the 1970s. He also used whey powder and similar dairy by-products to provide a soluble source of carbohydrates to encourage microbial activity in the compost.

BMS carry off first PPMA 'Advertiser of the Year' Award

...BMS gave the whole mushroom industry a boost at the recent Produce Packaging and Marketing Association Conference. In the face of nominations from most of the major worldwide fresh produce boards - Agrexco, Cape, New Zealand Apple and Pear Board, Outspan and the Israel Citrus Marketing Board Campaign 'Jaffancyone' - the BMS 'Make Room for the Mushrooms' TV and poster campaign in 1988, took the honours. This was sponsored by ASDA Stores, and Roy Hancock, Chairman of the BMS Marketing Group, received the award from Mike Allison, Director of ASDA. Congratulations BMS.

Norman House - Holyport Mushrooms

...Our good wishes go to Norman, following a further operation to replace hips. One of them was a second replacement and he tells me that he is being blamed for not putting 100% effort into mushrooms, but actually played football until he was 50! With a further three months on crutches, his patience, which he admits is very limited, will be extended to the maximum. After his son, Christopher's performance as Chairman of the SEI meeting in March, I do not think that Norman will have too many worries about the efficiency of the farm whilst he is partially incapacitated.

Interspawn

...Interspawn are very pleased to tell us that International Mushrooms Ltd, have indicated that they will join the Interspawn group. International Mushrooms are a fully owned Irish company, who have a technical agreement with the Lambert Spawn Company, Pennsylvania, USA. Their representative is likely to be their Managing Director, Mel O'Rourke.

Royal Mushrooms

...A press clipping from Douglas Miller:- 'Why are the Queen's guests at

Windsor Castle sometimes heard complaining that they have been virtually force-fed mushrooms during their weekend stays with Her Majesty?

The answer lies with the Windsor Estate's prolific production of edible fungi - 200 tons of mushrooms are created annually on horse manure from the royal mews. The Queen's thrifty nature decrees that few are thrown away, hence it's mushrooms for breakfast, mushroom soup for lunch and stuffed mushrooms for dinner.....'

Electronic Pallet Scale Range

...Adam Equipment Co. Ltd are launching a range of pallet scales, the DPS Series with capacities from 500 kg to 2000 kg.

The system comprises two weigh bars, each approximately fifty-five inches in length, made of steel. Each bar contains two heavy duty load cells which are connected to the indicator system, which can be desk or wall mounted, and linked to printers or a remote display unit.

The weigh bars can be positioned at virtually any width required and therefore can be used with most sizes of pallet. When not in use the bars can easily be stacked away and take up very little space. They are easily transportable, so can be moved around the warehouse, and into different buildings.

Adam Equipment offer a range of counting consoles to monitor input from the weigh bars. Top-of-the-range is the DPS 4 an electronic instrument with many features, including a piece counting capability of up to 999,999 units; pre-set sampling; sample enhance; automatic zero and span temperature compensation; store and recall for up to twenty tare and average piece weight values; accumulator with recall and print; negative count capability; simple two-button operation with keyboard overlay; lb/kg conversion with switch capability and LED indicators; and a bi-directional RS232C Serial Port or 20MA Loop Output.

Options include a bar-code scanning wand; a wall or desk mounted remote display; and a tally roll printer.

Kathleen Edwards

Kathleen Edwards, wife of Ron, died on the first of June; a memorial service was held at Bearsted church, near Maidstone.

Many members will remember her visiting several conferences and MGA social events and she will be sadly missed by all who knew her.

Our thoughts are with Ron and family.

Writtle to Morocco.

...A group of students from Writtle Agricultural College is organising an expedition to Morocco, in September 1989.

They will be obtaining sponsorship for this expedition, which will be visiting Agricultural and Horticultural establishments in Southern Spain, Morocco and Canary Islands. Additionally it is hoped an attempt on Jdel Toubkal (13700 feet), the highest mountain in North Africa, will be made. Further details available from Colin Falla at the College.

Northern Polytunnels Mushroom Division

...Northern Polytunnels has established a new mushroom tunnel division, to be headed by David Nelson BSc. (Agr).

Mr Nelson has over 15 years experience of mushroom cultivation, gained throughout the world, from turning compost by hand 10,000 ft high in the Himalayas, to hi-tech, computerised and mechanised mushroom farming in Holland.

Under Mr Nelson's management, the company intend to offer two distinct services to the mushroom-growing fraternity. One will be a total start-up package for new mushroom growers, including site survey, set-up costings, a full equipment and finance package, installation and technical back-up, growing and marketing advice. This package has been designed specifically for the non-mushroom grower looking to broaden his traditional product base.

The tunnel concept adapted by the company has been tried and proven in the Irish

mushroom market, where mushroom growers have made great inroads into the U.K. market previously dominated by British and European mushroom growers.

Wet air cooling system

...Modern wet air cooling systems can deliver cold, humid air into the cold room at temperatures down to 1.5°C and at relative humidities as high as 98%. These conditions preserve the natural freshness and appearance of the produce, prevent dehydration and weight loss and extend shelf life.

Baltimore Aircoil Ltd has several years of experience in Europe in the supply of components for wet air cooling systems including BAC products for wet air cooling systems is now available in the UK from Baltimore Aircoil's factory in Corby, Northants.

Mushroom Chalk

...Following the merger of Croxton + Garry and the Industrial Minerals Division of Blue Circle Industries plc, a wider range of mushroom chalks is available from Croxton + Garry.

With quarries at Melton on Humberside and Steeple Morden in Hertfordshire, the enlarged company is able to offer a better service to growers. Snowcap 10 and 20 are available for delivery from Humberside whilst Britomya C and S are produced in Hertfordshire.

Weighing Systems

...Parker Weighing Systems has announced two new electronic weighers.

Pallet Weigher

Designed primarily for the check weighing of palletised goods and boxed items the Pallet Weigher can also be used for weighing items up to 2 tonnes in weight.

Accurate to 1/10th of 1% the pallet weigher is manufactured in galvanneal steel and finished in signal yellow. Each unit comes complete with an electronic digital indicator with an indication range of either 0.5 kg or 0.2 kg.

The pallet weigher is fully portable and is fitted with nylon wheels and handgrip for easy movement. Price £1685.

Weighing Beams

A set of two beams and digital indicator designed for weighing all manner of goods from a single carton to stacks of timber or steel. Being fully portable the weighing beams can be used in almost any conditions and are capable of weighing items up to 3 tonnes in weight.

Ideal for check weighing goods at a number of difficult sites the weighing beams will easily fit into most car boot and are quickly and easily transported from site to site.

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DIGITAL TEMPERATURE MONITOR. Designed for the mushroom farm. Big bright LED digital display for easy accurate monitoring of temperatures. Two models, 12 or 24 probes. Standard range 60°F to 160°F (switchable to °C). Enquiries: Engineering Design & Production Ltd., Catfield, Gt Yarmouth, Norfolk NR29 5BQ. Tel: Stalham (0692) 82100. Telex: 957647.

TEMPERATURE AND HUMIDITY. Most successful growers use electronic instruments for control, indication and recording by Telemax-Anville, the people with 30 years experience. Details from: Anville Instruments, Watchmoor Trade Centre, Watchmoor Road, Camberley, Surrey GU15 3AJ. Tel: (0276) 25107/684613.

HYGROMETERS and THERMOMETERS: Mason's wet/dry bulb copper cased hygrometers complete with tables. Also metal framed pocket whirling hygrometers and extensive range of hot-bed, dial, max/min and other thermometers. Discounts for quantities direct from the manufacturer. Russell Scientific Instruments Ltd., Rash's Green Industrial Estate, East Dereham, Norfolk NR19 1JG. Telephone 0362-693481. Telex: 97322.

TAMPLIN MACHINERY SPARESSERVICE. Contact: Ken Proud - Tamplin Engineering (0243) 512599 or Telex 86402.

BRITOMYA C. The new slightly coarser mushroom casing chalk, sterile and cost effective with usage levels recommended at 10-25kg per bale of peat. Enquiries: Croxton & Garry Ltd, Curtis Road, Dorking. 0306 886688. Telex: 859567/8 C and G. Fax: 0306 887780.

FOR SALE: Second hand Dutch mushroom machinery. Head end filler, tunnel winch, tunnel filling line, plus conveyors. Please ring after 7.30pm. 0329 231 329.

DISPOSABLE POLYTHENE GLOVES for mushroom picking and waterproof aprons. Prices & free samples from Mushpro Ltd. 226 Belsize Road, London NW6 4BT. Telephone: 01 - 328 5715.

POSITION REQUIRED: Grower Manager, well experienced from construction to production. Synthetic compost, bulk pasteurisation and growing on different systems. Suitable qualified, would appreciate challenging job, either UK or Overseas. Contact Box No: 273.

FOR SALE: One Nowenco peak-heating fan, 25 tonne bulk pasteurisation fan. Almost brand new - only had 25 tonnes of compost through it. Tel: (day) 0366 500800 (evening) 0366 501044.

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plied in both Stainless Steel and Hot Dip Spun Galvanized, contact the specialists: Holbolt Ltd. Victoria Road, Halesowen, W. Mids, B62 8HJ. Tel: 021 561 3114. Fax: 021 56 4566.

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CORNWALL: - modern building designed for poultry but suitable for mushroom farm available together with 3 bedroom traditional Farm house of Barn for conversion. Set in attractive part of West Cornwall Ref: 740. Details from: Stratton & Holborrow, Charlestown, St. Austell Cornwall. PL25 3NJ Tel: 0726 65611.

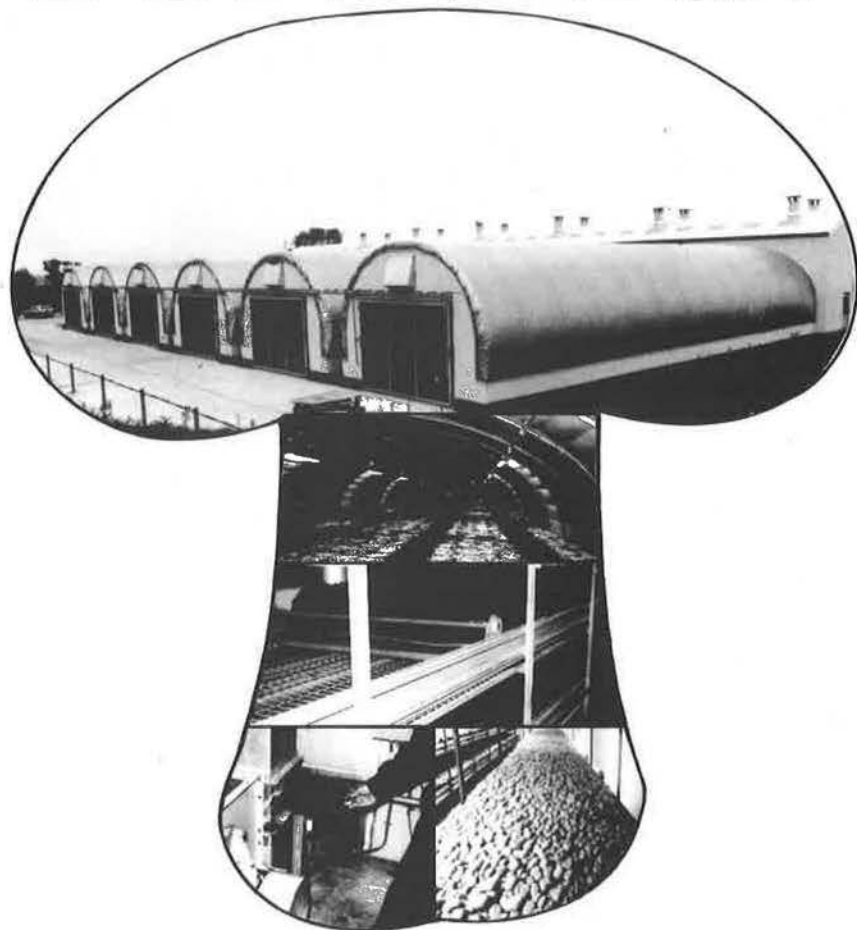
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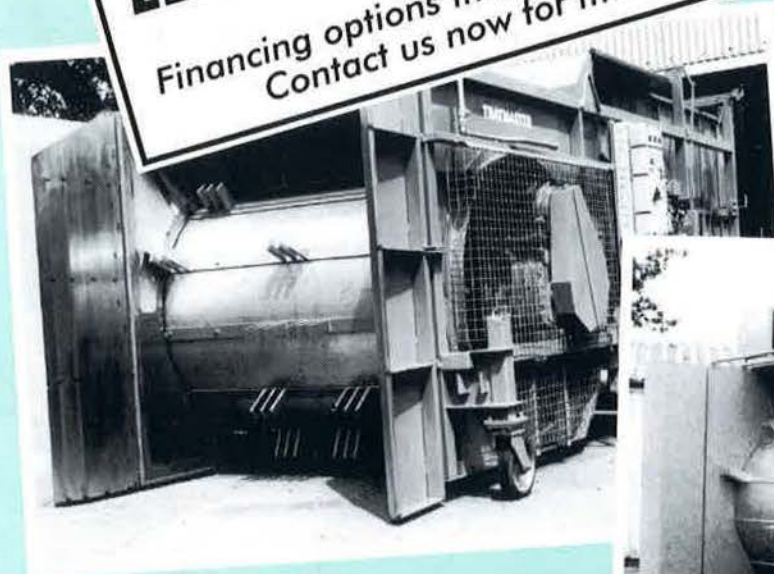
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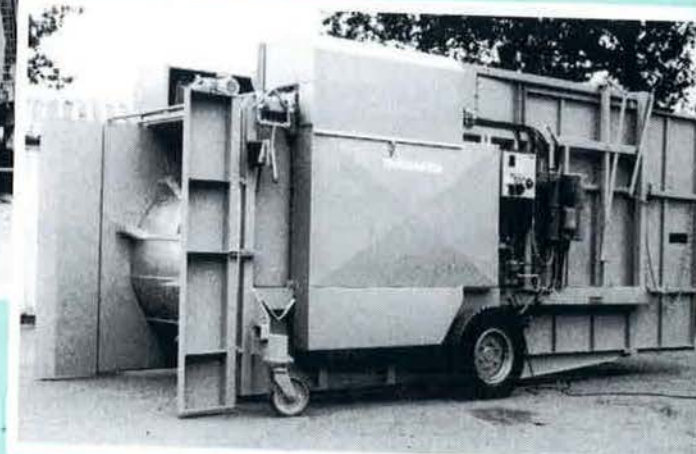
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'H' Series



'S' Series

What should you look for when choosing a compost turner? The ability to produce top quality compost and the reliability and endurance of the machine are, of course, essential. But there are other factors which vary according to your individual needs. Consider the features and equipment fitted as standard or as options, look at the range, capacities and performance of models available, and take into account the manufacturers willingness to produce customised versions to meet users exact requirements. Traymaster are unbeatable in all these criteria.

Traymaster compost turners are quality products which have been tried, tested and accepted for almost 15 years. You can't buy better. For leaflets, advice, quotations contact:



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