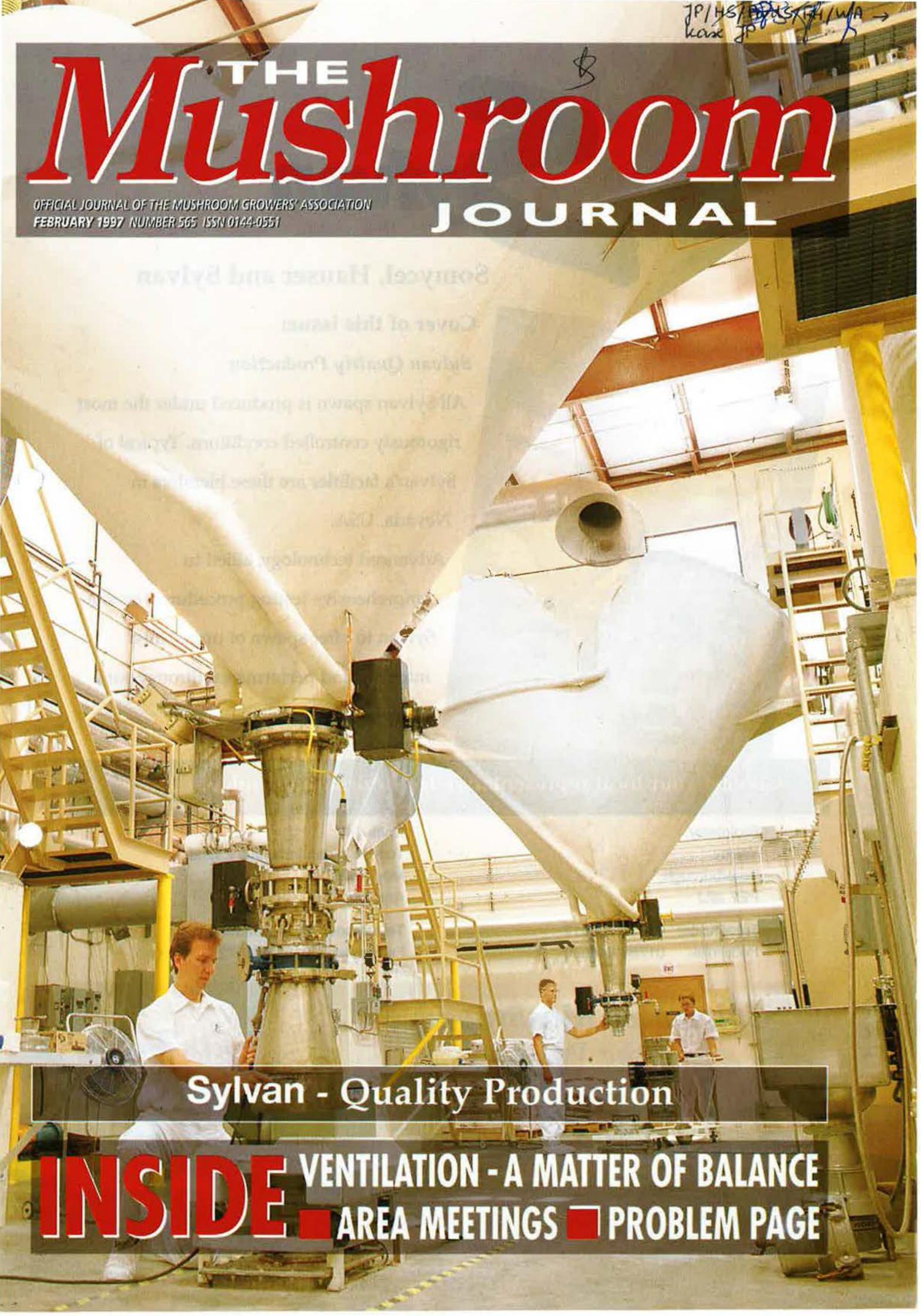


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THE Mushroom JOURNAL

OFFICIAL JOURNAL OF THE MUSHROOM GROWERS' ASSOCIATION
FEBRUARY 1997 NUMBER 565 ISSN 0144-0551



Sylvan - Quality Production

INSIDE ■ VENTILATION - A MATTER OF BALANCE ■ AREA MEETINGS ■ PROBLEM PAGE

Sylvan

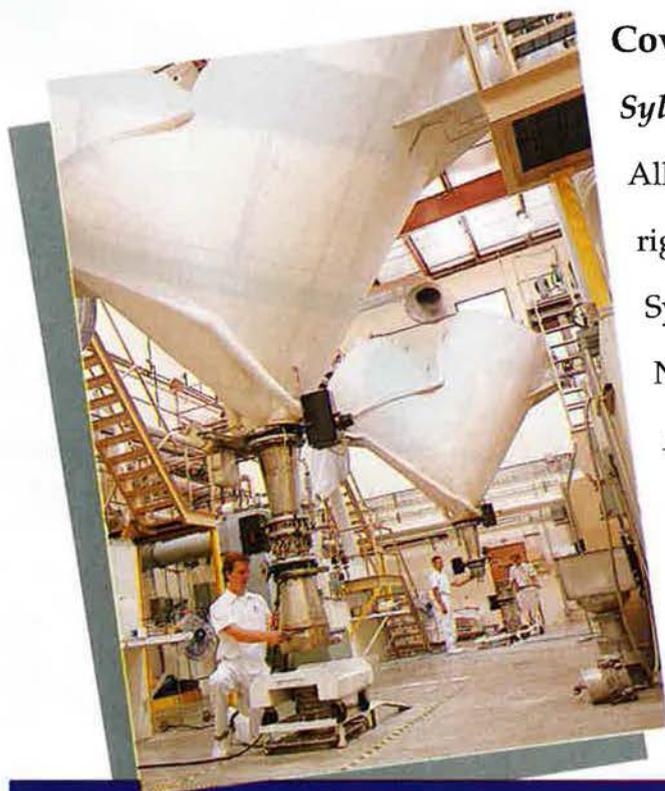
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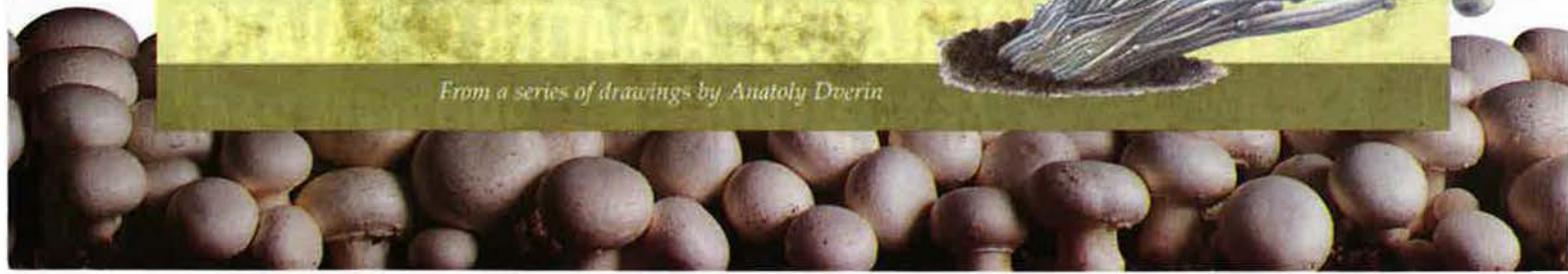
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MGA Council Chairman Jack Orr, Vice-chairman Miles Middlebrook, Jim Rothwell, Robert Brown, Richard Huntington (Hon Treasurer), Geoff Ganney, Barrie Hughes, Dennis Watkins, Tony Dumbreck, Bryan Dyer, Frank Stewart-Wood, Peter Woad, Roger Lunn, Adrian Sampson and Peter Grierson (representing Spawned Composters).

Articles for consideration are welcome; also letters for publication which should make a point strongly and as briefly as possible. They may be faxed or posted and should be addressed to the editor.

The editor, editorial advisory board and the MGA do not necessarily support, nor are they responsible for, statements made by contributors to the Journal. The leading article is normally a statement of MGA policy.

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ISSN 0144-0551

THE Mushroom JOURNAL

February 1997

No 565

EDITORIAL

It's good to talk

In the October and November 1996 Mushroom Journals, two letters were published from Growers on the subject of the quality of bought-in substrate. There had been a lot of talk within the Industry and those letters reflected, from a Grower's perspective, what many of them had been saying. The first of those letters prompted a good deal of discussion at the Annual Conference and the topic was aired amongst everyone, from every sector and whatever their particular angle on it. In the Eastern Area, local Chairman Damian Hearne focused the debate by making it the subject of an Area Meeting on 15th January 1997 (which Richard Gaze of HRI writes about in this edition). Growers, Composters and other Trade Members turned out in force and followed up the Presentations made by the two Speakers with a lively discussion. Participants heard every side of the story and mutual understanding was undoubtedly improved; only rancour left before the Meeting ended. It was concluded that something has to be done collectively, in the interests of the Industry as a whole and the clear message came across that we are all in this together and not on opposing sides. The need to bring matters like this into the open was acknowledged and it was suggested that the subject be debated in other Area Meetings and other gatherings as further steps towards the goal of finding a workable solution. Our Director took the opportunity to remind us that it is open to every Member, whatever his or her shade of opinion, to make a point in the Journal in a "Letter to the Editor" and that our Council has Grower and Composter representatives on it who have been elected to represent the interests of their "Constituents". The communication channels are there to be used by everyone and there are many doors into the system.

It's good to talk and it's good to see issues being raised and finding their way through those communication channels to where something can be done about them on an Industry-wide basis. Collectively, we can, and we are, making things happen.

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South East I and II Area Meeting

We are pleased to announce that the next South East I & II Area Meeting and Luncheon will take place on **Tuesday, 11th March 1997**. The main speaker will be Dr Ralph Noble of HRI Wellesbourne on the subject of 'Casing Soils and Casing Management'. The programme will include a discussion session.

The venue will be The Grasshopper Inn at Westerham (location map available from Melissa at the MGA). If you are in that area, have not yet received an invitation, and would like to attend – call Melissa or Susie at the MGA on Tel 01780 766888. Numbers may be limited.

New Chairman – Irish Mushroom Growers' Association

We are pleased to confirm that in September last year the Irish Mushroom Growers' Association appointed a new Chairman.

The post has been taken up for a period of three years by Mr Aidan Ryan. Mr Ryan's details are as follows:-
Mr Aidan Ryan,
Chairman,
Irish Mushroom Growers' Association,
'Brownwood',
Enniscorthy,
Co. Wexford,
Ireland,
Telephone:
00 353 5433616.

We would like to take this opportunity to wish Mr Ryan every success.

Have you considered the Mushroom Journal as an advertising medium? If you would like full information please contact

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1997 Annual General Meeting

The 1997 Annual General Meeting will take place on **WEDNESDAY 23RD APRIL 1997**, at the Falcon Hotel, Stratford-upon-Avon. (Tel: 01789 279953 Fax: 01789 414260).

Special room rates have been negotiated for those wishing overnight accommodation on Tuesday, 22nd April, as follows.

Double/Twin room – £70.00

Single room – £55.00

These rates include full English breakfast and VAT.

The Annual General Meeting presents the opportunity for all Members to find out more about how the Association works for you and for voting Members to exercise their votes.

If you do not regularly

attend, please make a resolution to attend this year's AGM.

Remember, the Association belongs to YOU, its Members.

AGM Invitations will be sent to Members at the beginning of April, but the MGA Office will be very pleased to receive your expressions of interest in attending, at any time.

Please contact Cecilia Timewell on Tel. No. 01780 766888.

1997 MGA Conference

6th – 8th November 1997

Stakis Brighton Metropole Hotel, Brighton

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In 1997, the MGA CONFERENCE returns to the South Coast of England, which has always proved to be a popular location.

The venue for the Conference is the STAKIS BRIGHTON METROPOLE HOTEL, BRIGHTON, an elegant hotel, situated on the sea front.

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Access to Brighton is good, via the M25 and M23 Motorways and, with Gatwick Airport only 40 minutes away by car, there is no reason for anyone not to

come to the Brighton Conference!

This year it will be easy to park your car, as free parking facilities are offered to those staying at the Conference Hotel.

The Conference programme has, in the interests of topicality, not yet been finalised, but delegates are promised a very full programme of events, with Lecture Programme, Trade Exhibition, Social Events and a very special programme of TWO Farm Walks on the Saturday.

LOOK OUT FOR FURTHER CONFERENCE DETAILS IN FUTURE ISSUES, BUT MAKE A DATE IN YOUR DIARY NOW FOR 6TH – 8TH NOVEMBER 1997, STAKIS BRIGHTON METROPOLE, BRIGHTON, SUSSEX BN1 2FU.

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Director's Notes



Horticulture Research International

After a long wait, the good news this month is the announcement that Horticulture Research International is to remain in the public sector, for the present, as an executive, Non-Departmental Public Body, sponsored by the Ministry of Agriculture, Fisheries and Food. There is, however, perhaps a slight caveat in the announcement made by the Minister for Agriculture which we must keep an eye on; it reads "HRI has achieved a great deal since its creation in 1990 and its high reputation is well deserved. Nevertheless, we should strive to secure further improvements where possible for the benefit of both HRI and the horticulture industry. The Government's substantial restructuring investment in the body provides an excellent foundation. The Government has also agreed a number of steps to help improve efficiency on a wide range of research establishments remaining in the public sector. My Department will be working closely with HRI management over the coming year to resolve outstanding operational and staffing matters and to develop the body's science strategy and business plan. This will provide the basis of a report to Ministers at the end of 1997."

Election of Office-bearers

The process of electing representatives to serve on the MGA Council for the term of Office commencing in April 1997 has already started. The following Members have indicated that they will be standing for re-election:-

- Mr. P. Woad, Blue Prince Mushrooms. (Large Farm category)
- Mr. B. Dyer, Monaghan Middlebrook Ltd. (Large Farm category)
- Mr. A. Dumbreck, R. D. Dumbreck & Son Ltd. (Scottish Area)
- Mr. P. Grierson, Agricultural Supply Co Ltd. (Spawned Composter)
- Mr. F. Stewart-Wood, Aylesbury Mushrooms Ltd. (Medium Farm category)

The following Members have indicated that they will be standing down:-

- Mr. R. Huntington, Monaghan Middlebrook Ltd. (Honorary Treasurer)
- Mr. R. Lunn, Haymes Farm Produce Ltd. (South West Area)

Voting Members in the relevant size category/Area are entitled to submit nominations for the appropriate seat(s) on Council and if there is a contest, to vote. In the case of the vacancy for Honorary Treasurer, all Voting Members have that entitlement. Please let the MGA Office know as soon as possible if you have not received notification from us or if you require further information.

Annual General Meeting

It's almost that time of the year again – the Annual General Meeting is to be held on Wednesday 23rd April 1997 at the Falcon Hotel, Stratford-upon-Avon. Cecilia Timewell at the MGA Office will be pleased to note expressions of interest from those who wish to attend and don't forget that it is open to Members to bring any subject before the AGM, provided twenty-one days' advance notice in writing has been given to the Director. This year, the deadline for letting me know of anything you wish to raise is therefore Wednesday 2nd April 1997.

Agricultural Wages Board

The subject of wages is of such importance that it merits raising again and again. The Workers' side claim this year includes:-

- Increase in minimum wage
- Reduction in working week to 35 hours
- Ten days paid Paternity Leave
- A contributory Pension Scheme for all Workers covered by the Wages Order

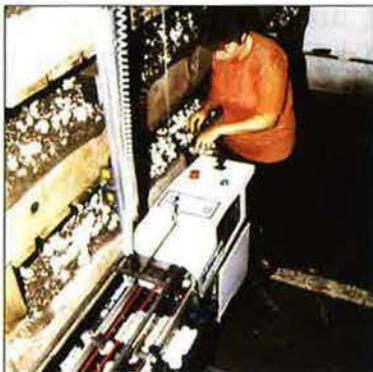
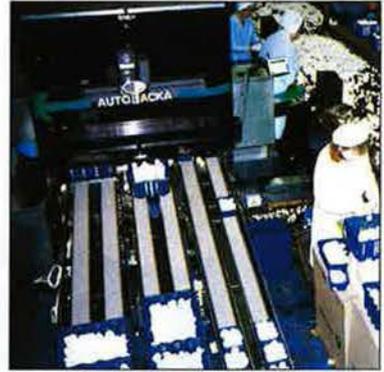
The AWB negotiations will take place on 18th and 19th March 1997 and nothing can be more relevant to the Board's understanding of the effect on Growers than factual information on the economics of running a Mushroom Farm. Help the Industry's case by writing as soon as possible to Professor J. S. Marsh CBE, MA, Chairman, Agricultural Wages Board, Nobel House, 17 Smith Square, London SW1P 3JR. A copy to the MGA Office of any letter sent directly to the AWB would be appreciated.

Out and About

The past month has seen me out and about for much of the time on MGA business, notably at meetings with An Bord Glas and the Irish Mushroom Growers' Association, with the NFU and MAFF and at a Seminar in the House of Commons on Exporting British Horticulture at which the Minister for Horticulture was the key Speaker. The outcome of these meetings will be reported to our Management Committee and thereafter, to our Council for our Office-bearers to consider appropriate follow-up action. I mention these external activities not only because of their benefit as fora in which to discuss specific issues, and not only so that I can let you know how they are taken forward within the MGA, but because they are, just as importantly, a means of getting to know people and it is that which oils the wheels of our dealing with others.

Trudy Johnston

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1 December

Having seriously contemplated making a five year plan reality returned.

2 December

It's a pity someone couldn't find an easy way of recovering plastic mushroom sheds! Continually it is a time-consuming problem to get the sheets on, let alone on neat and tight. At least after many years we have learnt to use heavy plastic sheets that will last over 20 years.

3 December

Elevator on the filling line is well worn and has developed a continual slip which is ideal to give an uneven fill. The importance of fluffing out and evenly filling compost, no matter what system you use, can never be overstated. Even temperatures and subsequent good conversion will not be maintained otherwise. A number one basic for successful mushroom growing.

4 December

Some days you get that urge to try something new, but economics always seem to prevail and as always the known way is followed. How progressive that is I am never sure and it certainly takes the excitement and buzz out of the business.

5 December

It doesn't seem six years since John Major opened the Snowcap packing complex. But when you look at the condition of it, it looks more like 60 years! Certainly have to be re-furbished this year and to achieve that when you are still having to use it, is no

small feat. In fact, I am not sure how we will do it, but we will.

6 December

Quality audit discipline on the farm is essential to ensure we keep our product up to the customer requirements. I never cease to be amazed how quickly standards fall or how quickly the reliability of product quality can change on the growing bed in such a short space of time. Never underestimate the difficulty of 'maintaining standards'.

8 December

I suppose on reflection 'maintaining standards' is what all mushroom production is about.

9 December

Growing flat mushrooms seems to be presenting us with problems as to the best cultural method to do the job in a controlled way. Looking at first flushes with large flats growing over beautiful closed cups seems wrong. Yet leaving whole flushes, even after careful thinning, gives us too high a wastage level. Using carefully thinned first flushes gives excellent quality with lower wastage levels,

but delays our second flushes. Back to the drawing board!

10 December

It just occurred to me how conscious we used to be about growing and flat mushrooms with the fears of mushroom virus transfer from spores. **A real fear.** Now that puzzles me in that farms do grow programmed flats or even economy pack open cups, which both have very high spore loads, and yet virus very rarely seems to be found. Maybe I am wrong and will so be informed at a later date!

11 December

The mental picture imprinted on the brain of what a mushroom crop should look like at every major stage of production should be transferred to computer control. Mind you there would be no doubt some variations in the ensuing programmes! Crop reading experience is built up over many, many years, and I suppose has individual in-built judgement criteria.

12 December

How often we get caught out with water requirements when environmental conditions change. In fact you

can guarantee it will happen every time. Yet the growers are experienced, have plenty of time to check and re-check, but simply misjudge the situation!

13 December

Looking at today's spawning and at the carefully presented length of phase II straw. Good structure, soft, good length and inbound moisture. But if you look at phase III compost it is chewed to nothing and gives a milled appearance. Now which is right?

14 December

Cap distortion we are experiencing seems to be connected with cold air hitting the surface of the casing at pin formation. High bed temperatures seem; to have kept the air temperature high enough to prevent heat being called for. You never can tell what sort of conditions are likely to take place in mushroom growing and I imagine only with careful computer controlled environments will you automatically adjust.

15 December

Severe bacterial developments on the side of ►

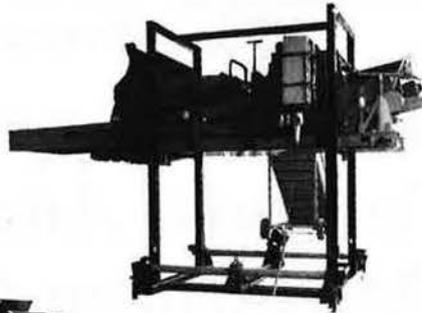
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the stipes have formed once again to such an extent the outer layers have peeled back like a banana skin. It really is not a typical old or new blotch colour and really gives an appearance of being internal bacterial transmission. There must be far more bacterial problems than we understand in mushroom production, but I have no doubt we will gradually come to know many more.

18 December

White plaster mould still continuing to form in isolated patches which can only mean an unhappy compost. Ideas of an unhappy compost performing at maximum efficiency is extremely **wishful thinking!**

19 December

Modified casing mix to a slightly less heavy greasy consistency has certainly improved evenness of pinning. Or was it just repairing the casing machine? Machine wear is a continual process but needs to be identified as quickly as possible. But it rarely happens of course.

20 December

Quality greatly improved with hard white mushrooms and very little premature opening. In fact there has been a dramatic fall in value pack to the extent there are not enough for orders! Is that improvements in compost, casing, crop handling, or a combination? We will seriously have to analyse what it is as the change is so dramatic. It is likely to be nutritional? Why do you say that? It could simply be better moisture control, but I doubt it!

21 December

Flies virtually non-existent and no fly control has been used through 1996! Other growers tell me they are still struggling to reduce sciarid levels and chemicals don't seem to be working very well, or not at all. Maybe that's not a

general condition. Maybe we are just lucky...

22 December

Never has a mushroom Sunday been like today. Orders are meteoric and it is pure bedlam clearing the beds. **This is insanity.**

23 December

Well, we seem to have crops on time with both customers and people to pick the mushrooms. You could put it down to thorough planning, but many would agree it is luck! Perhaps it's a bit of both!

24 December

So much hard work for a short period where one endeavours to minimise loss in the hope of better things around the corner. It is a time that creates so much pressure for the work-force in completing work and running the home. It would be wonderful to be able not to pick for three-four days like we did years ago, but that is wishful thinking. Today's mushroom business is all about the market place.

25 December

I suppose everything on the farms is alright. Well, it has two chances...

27 December

It is of course not amazing when you have a very short working week to find major areas of breakdown. It is a very well known fact that the role of "Sod's Law" is governed by the "**pressure created**" (S.L - P.C = Mushroom Growing).

28 December

Plenty of mushrooms still to pick and most remaining closed. Cannot remember this before and am now worried as to what we have **done right!** It is often more difficult to know that, than to sort out what **you think is wrong.** I have been convinced for many years

that the right way for the most effective research and development would be achieved by intimate studies on a farm producing high yields of top quality mushrooms. And to continue those studies when that situation no longer exists.

29 December

Mushroom demand very strong and it does seem that growth has been stimulated, probably because they are too cheap. What is that termed, price elasticity? Or something like that? Perhaps we can find an increase in price to the producers in the New Year.

30 December

Few pieces of *Dactylium* have appeared again. Yet the last samples sent to John Fletcher

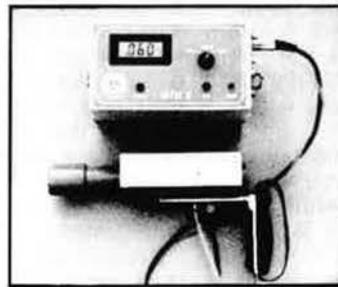
were chemically sensitive. What is always the case is when picking control is not quite 100% then we seem to be more vulnerable to disease. **"Well! you've known that for generations!!"**

31 December

Yet another year end. From our point of view a very difficult one culturally as production has always been a struggle. You try to evaluate why and the quality of straw will always be high on the list. Much is due to people, and the continual daily pressure of the operation. Facilities, or rather lack of them are also a fight to be overcome. But we go into 1997 with renewed vigour, a crate of whisky, new found wisdom, and a massive great overdraft. **Enjoy 1997!**

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PETER FLEGG INVESTIGATES



Growth Promoters and Inhibitors –

significant factors or red herrings?

Last month I raised, perhaps rather dismissively, the spectre of substances in the substrate with the ability to cause unexpected peaks and troughs in the mushroom yield pattern. If such substances are a major factor in mushroom production, they are not going to help towards the current desire to minimise the variables. Further investigation seems called for.

Growth stimulants – what are they?

Although substances reputed to promote or inhibit mushroom growth have a long history, there is relatively little information on them.

In a reasonably thorough search going back more than 50 years of publications I have been hard put to finding a score or so of papers which contribute substantially to the subject. Out of 300 pages or so devoted to 'The Biology and Technology of the Cultivated Mushroom' (Editors Flegg, Spencer and Wood 1985) there is just over one page (pages 54-55) on growth stimulants and practically no mention of growth inhibitors. A red herring then? Well let's see.

On page 54 of the above mentioned book vitamins and growth factors (promoters or stimulants) are defined as organic compounds required (by the mushroom) in minute amounts for growth. They act as part of the enzyme systems or as important structural components. The mushroom is unable to produce these substances for itself, hence their absence from, or presence in, the substrate is a matter of some importance to the mushroom's well-being. If completely absent from the substrate the mushroom cannot grow, but the addition of minute amounts can have dramatic effects and the hitherto struggling mushroom mycelium is restored to its full vigour.

The early work by Treschow (1944) (and Bohus, Mushroom Science 4) established that the mushroom has a

requirement for some elements of the vitamin B complex, particularly B₁ (thiamine) and B₇ (biotin). In the 1950s some workers claimed beneficial results on yields from adding vitamin B mixtures to mushroom beds, while others found no such effects. As many of the microbial inhabitants of a mushroom substrate, thermophilic actinomycetes, fungi and bacteria, produce the components of the vitamin B complex, it seems that, in a properly prepared mushroom substrate there is unlikely to be any shortage of the B vitamins needed by the mushroom. If not a red herring then growth substances seem hardly to be a significant factor.

Treschow, in his detailed and thorough study of the nutrition of mushroom mycelium also found that growth was stimulated by extracts of nettle leaves and of alfalfa. It was eventually established in 1958 by Frazer and Fujikawa that the mushroom is unable to manufacture certain amino acids in sufficient quantity, but again, with so much other microbial activity in the substrate producing many metabolites, it is unlikely that there will be any shortage. Such results do suggest, though, that attempts to grow mushrooms on substrates which have undergone little or no microbiological conversion might need supplementation with some of these growth factors.

Around the early 1970s it was found that some oily and fatty compounds can stimulate the growth of mushrooms in pure culture. Among the few other investigations we have Impens and William (1968, Mushroom Science 7) who found stimulating effects on growth from adding complex compounds of amino acids and sugars. Their experiments were done using pure cultures growing on nutrient solutions in the laboratory, so it is uncertain how their results would translate to commercial mushroom production. In 1989 (Mushroom Science 13), Shou, Chen-Hisoh reported that a substance called 'Mushroom Robustin', said to be

a mixture of vitamins, micronutrients, plant growth regulators and quick acting minerals, when added to mushroom substrates in various ways led to increased yields. Similarly, in 1991 (Mushroom Science 13) Wu Jin Wen, Sun Yu Ping and Zheng Xue Ping reported that 'Zeng-Chan-Ling', of unspecified composition, and described as a new kind of growth promoting agent, when sprayed on the beds at pinning also raised crop yields.

A reassessment needed?

It seems, then, that adding various substances to mushroom beds in one way or another can sometimes improve crop yields. Without being derogatory it suggests to me that a substrate which responds to such additions is deficient in some way. The successful additive is contributing the missing component(s). If relatively large amounts of the substances are needed to produce an effect, then it would seem that the shortage is nutrients such as proteins, amino acids, fats and so on. This effect describes the successful use of the commercial supplements currently in wide use. If a beneficial effect is obtained from the addition of minute quantities then it is most likely that growth stimulants (such as vitamins) are being supplied. Of course, some successful additives could be contributing both nutrients and stimulants.

Those experiments which suggested that a well-prepared substrate, full of microbes, is unlikely to be deficient in essential vitamins and growth substances were carried out a long time ago. Average crop yields in the 1950s and 60s were much lower than they are today. Could it be that today's higher levels of production sometimes overstretch the reserves of vitamins and growth substances in the substrate? Perhaps it is time for a reassessment. Could the highly productive and

nutritionally supplemented substrates in use today benefit from vitamins supplementation?

Growth inhibitors

If there is little enough information and firm evidence on the effects of, and need for, vitamins and growth stimulants, then there is even less on growth inhibitors.

One of the earliest papers describing the adverse effects on mushroom mycelial growth appeared in 1953 (Mushroom Science 2). Heinemann and Engels showed that a wide range of organic acids reduced mycelial growth. It was suggested that substrates which had not been properly prepared could contain some of these organic acids and poor mushroom mycelial growth would result. Well, that seems fair enough. A well-prepared substrate should ensure no problems. Ammonia is a well-known inhibitor of mushroom mycelial growth,

and, again, is usually present in the substrate at high enough concentrations to do harm only when the substrate preparation process has gone astray.

Interactions with micro-organisms

Gapinski in 1968 (Mushroom Science 7) found that some substances extracted from peats using water or dilute sodium hydroxide affected the growth of mushroom mycelium. Most had beneficial effects, but some reduced growth. He suggested that such effects might be one of the causes of varying mushroom yields. Whether this work has ever been followed up or not, I have not discovered, but the effects of micro-organisms on the casing and their effects on the production of fruit bodies have been given some attention. Despite the efforts of several scientists the full story of how mushroom fruit bodies are initiated remains to be discovered. Gradually the many effects of micro-organisms and the substances they produce during their growth are being revealed (for example, O'Donoghue-Maguire and Ryan, Mushroom Science 13).

A wide range of micro-organisms lives alongside the mushroom in both casing and substrate. One of the characteristics of those which inhabit such media is that they produce and excrete substances which inhibit the growth of neighbours and competitors, that is, antibiotics. A full study of the interactions of these micro-organisms with one another and with the mushroom is likely to be a vast undertaking. It is also, perhaps, one which is unlikely to appeal to committees allocating, scarce R&D funding and requiring a fairly rapid pay-back in order to justify their choices. Some work is in progress though, for example, I referred last month to recent work on the interaction between *Scytalidium* and the

mushroom being carried out in the Netherlands. Perhaps one day all (well, most) will be revealed.

A final note

One final note on the subject of growth inhibitors and mushrooms concerns a paper read as recently as the 12th North American Mushroom Conference held last July in Vancouver. Professor Kelly Duncan, Dean of Science at the University of Canterbury, New Zealand presented a paper entitled 'An ecophysiological approach to mushroom media' (Mushroom World, September 1996). One of his major interests is extending the range of plant wastes which can be used for growing 'speciality' mushrooms. His work has centred on studying inhibitory factors in substrates which prevent or hinder mushroom growth. He lists several groups of known inhibitors which include polysaccharides, reactive lignins and tannins. Among the plant wastes he is working with are coconut sawdust, pine sawdust (in chicken manure?) corn stalks and wheat straw. Materials not entirely foreign to the cultivation of *A. bisporus*.

Although we seem to know very little about mushroom growth inhibitors, the subject can hardly be said to constitute a red herring. It is not a dead duck either. We may well hear more on the topic in the future.

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The Eastern Area Meeting

**Bury St Edmunds
15th January 1997**

Compost quality

Two speakers talked on this subject. Malcolm Hensby of Hensby Composts Ltd and Adrian Hearne of Tech-Check, the Gloucestershire based compost analysis service. As one has come to expect the meeting was well attended, despite the fact that the East of England was shrouded in dense freezing fog. What better testimony to the popularity of these gatherings could one have?

Damian Hearne, the Area Chairman briefly introduced the meeting in his own quite inimitable style, setting a relaxed, good natured but entirely serious tone for the rest of the afternoon.

Malcolm Hensby

I didn't time it but my recollection is that Malcolm spoke to us for over an hour. You might perhaps wonder why that should be of any importance. He told us a great deal during that time, about his own career, about Hensby Composts, about compost making and the nature of compost, interwoven constantly with his ideas about the nature of the relationship between grower and composter. A daunting task to communicate in such a short report.

In an attempt to do that perhaps the first thing to remark upon is Malcolm's unique perspective on compost and compost making. He spoke to us as a grower - customer and now as Chief Executive of the compost company supplying himself. Whether this makes him an unusually well informed and understanding grower or equally, composter is perhaps debatable but certainly an interesting and unusual, if not unique, perspective.

Background

To explain this position Malcolm gave us a brief resume of his 16 years in the mushroom industry. He left Ford and joined his father, Ferd Hensby, at the compost yard in 1979 or thereabouts. The idea was that he would become involved so that Ferd could retire! He went on to explain that of course retire he didn't. So that after 18 months or so Malcolm was tempted away to join a



Speakers Malcolm Hensby (left) and Adrian Hearne (right).

friend and to grow mushrooms at Barkston Heath. As he described it, the classic story of riches to rags. Despite that and minus the friend, he is still there, taking 60 tonnes of Hensby phase II blocks each week, servicing multiples and by his own admission making a moderate living. So he stood before us as a grower of 16 years experience.

Last year, owing to Gerry Barker's unfortunate illness he rejoined the composting company and so stood before us also as one of the country's major composters.

Hensby Composts Ltd

Malcolm reconciled the apparent contradiction of being two things at once by explaining that he had largely delegated management of the 70 people working at Barkston Heath whilst undertaking that of the 40 at Hensby's himself.

In an unusually frank account of the trials and tribulations of the last year, in which, if he erred at all, it was on the side of under valuing the achievements of the yard, he concluded that the man-

agement team was working well and that compost quality had improved compared with last year.

James Burges who had previously been out amongst the growers providing technical support is now phase I manager. Shiraz Ameer is technical manager, both being supported by Malcolm and Brian Fairbrother.

Malcolm has taken James's role in visiting growers. He rather enigmatically said that such visits had opened his eyes concerning growers' facilities. Doesn't it always?

The subject of discussions with Dennis Watkins and John Lyttle concerning the future of the company was freely raised, Malcolm made it quite clear, however, that despite any current uncertainties Hensby Composts would make the plans and investments required to maintain its market position.

Compost production

I'm struggling to adequately encapsulate Malcolm's various themes which were clearly stated on the day but more difficult to summarise. One that I

ng



An evening meal at the Farmer's Club followed the meeting

warmed to was the intrinsic variation of compost raw materials and the relevance of detailed analysis and process monitoring in relation to the experience of the composter. Malcolm showed us sheets and sheets of analytical results, for every stage, which Shiraz had provided. They were interesting and nice to see. His theme was, I believe that whilst they were essential they were only part of the story. Without the flair and experience of the composter they were not much good. I hope that's what he meant as I'm sure that's right. Compost is far too complex for understanding to succumb to this simple analysis of moisture content, nitrogen level and so on. In the hypothetical situation of having to choose between analysis and a good experienced composter, if you could only have one, who would choose analysis? The better option by far, of course, is both.

These deliberations lead to what was perhaps Malcolm's main theme of the afternoon, which was that even assuming all the due diligence in the world compost will vary. Everyone that has ever made compost will surely endorse that.

Therefore, the most important factor in the equation is the grower – composter relationship.

Grower – composter relationship

His contention was that this relationship should be symbiotic. Without indulging in a pedantic analysis of what exactly that means biologically, I would redefine it basically as living together and mutually dependant. On that basis not only should the relationship be symbiotic, it is, whether either side likes it or not.

What most of Malcolm's subsequent ideas developed were in fact observations of how this relationship could prosper to the mutual advantage of both grower and composter. But as he said, to do so it had to be an honest and open relationship. It was no good growers claiming poor performance based on false expectations or poor practice of their own. Conversely composters had to accept they sometimes get it wrong and the potential of some batches is not as high as one might hope.

He raised the question of whether growers should pay on performance. A simple question but several more follow in it's wake. Would one pay a premium following an exceptionally good crop? Would each grower have a handicap calculated on past performance so that for some the median line was 500lb/tonne and for others 550 or 600? How would one deal with on-farm mistakes? In a way he returned to the question from several angles by stressing the trust and two way communication that was necessary to get the most out of what is undoubtedly an interdependent and intimate relationship. A sentiment one can only applaud. There is no them and us situation, in reality, between composter and grower is there? They are two parts of the same process as the larger compost producing farms demonstrate quite clearly.

Commitment

Malcolm's was an unusual talk not only because he brought the twin perspectives to bear on the subject of composting but also because of the range ►

AREA MEETING

and openness of his remarks. One was left with much to think about and firm conviction of his commitment to continue to take Hensby Composts forward in a successful and mutually advantageous relationship with all their growers.

Adrian Hearne

Adrian's talk neatly complemented Malcolm's. Tech-Check are involved in analytical services for many grower-composters and his talk was a clear account of the quality control steps available throughout the process. As was said in the previous talk, composting, whilst still an art, benefits from constant analysis and physical monitoring throughout its progress from raw material to the completion of phase II.

The main objective of all such activity being to detect variation and where appropriate to rectify the situation by bringing that factor back within accepted parameters.

Adrian also stressed the importance of the relationship between composter and grower. He also provided some interesting figures for the range of analyses considered 'normal'.

	At filling	At spawning
N	1.7 - 2.2	2.3 - 3.0
NH ₄	0.4	0.05
% moisture	73 - 75	67 - 72
pH	8 - 8.8	7.4 - 7.8

I haven't detailed all Adrian's technical information as it might be more appropriate to deal with it as a separate article.

Discussion

Appreciation of the two talks was quite clear by the length of the discussion period and the number of the audience who were prepared to participate.

The major preoccupation was undoubtedly the relationship between growers and composters and the need for mutual trust, understanding and information flow in all directions. One suggestion from David Walker of Gateforth was that it had been found beneficial for growers to pass information between themselves. In this way problems that had been wrongly attributed to compost deficiencies had become very quickly apparent to the growers.

Another suggestion put forward by Martyn Dewhurst of Tunnel Tech was the

willingness of composters to pay penalties if compost delivered fell outside agreed parameters. The difficulty here, of course, is that such composts can sometimes crop very well which underlines the difficulties and complexities of defining a good compost. Rodney Barrett of Agricultural Supply suggested that the whole process of compost production was likely to become more critical to machinery and plant breakdown in future.

The case made by the composters both from the floor and the platform seemed to me logical, pragmatic and to make common sense. Comment from the growers in the audience gave some slight indication that the trust and understanding, whilst well on the way, wasn't quite there yet.

Trudy Johnston, the Association Director, closed the meeting, giving the opinion with which everyone present agreed, I think, that such an open debate was very constructive.

I certainly agreed. This meeting once again vindicated my belief in the value of area meetings. As always, thanks to Damian for ensuring that they happen in the Eastern Area and, of course, to Malcolm and Adrian for the effort they put in to enable this unusually positive debate of such an important subject.

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INNOVATION, TRAINING AND EDUCATION



Dactylium – prudence or heroics

By Richard Gaze of HRI

As readers of this column will know, I can at times become somewhat preoccupied by the whole concept of what really constitutes a problem. Whilst this may result at times in a degree of opaqueness it arises from the sincere belief that often the real problems go unnoticed. It has even been suggested that the title of this column be changed, particularly after January's issue.

In that issue I began to review the problems of the past year but in doing so it became apparent that whilst there had been many problems, some quite serious ones, the overall tenor of the analysis was of quiet optimism. Problems

indeed there were but most were being constructively dealt with and those usually considered outside our control, if not very visibly improving, were certainly not getting any worse.

Quite clearly false confidence in itself can be highly problematical but real confidence, well founded, is an enormous benefit to any enterprise and to fail to recognise the signs that give birth to it a real problem.

What I'm trying to say, and probably failing to achieve, is that problems come in many guises. To restrict oneself to the immediately obvious is constraining.

There has to be a case for ranging further and wider, to include following and analysing improvements to accepted problems, to chronicling scientific and technological innovations and exploring all the many components involved in growing and successfully selling mushrooms.

If there are times, therefore, when the subject matter of this column doesn't seem to be addressing the subject, bear with me. The central core remains the identification or anticipation of the problems that beset us and what we might do to overcome or to avoid them. Sometimes, also, stumbling across those we hadn't previously noticed. Which leads me to this month's subject, *Dactylium*, which may further illustrate some

of the points being made in this introduction.

Cobweb 1996

This column reflected the concern and general chaos in 1995 that the disease caused us. Three issues were exclusively devoted to it. 1996 has, thankfully, seen a diminution of the problem in general although a few farms still suffered quite badly. We have all learned a lot, both at the practical level and from the investigations carried out, funded by your levy board the HDC.

I don't think, however, that any of us, after the experiences of 1995 should be complacent about the situation. Now seems a good time to reflect on what we have learned and what we are still doing and need to do to ensure that the epidemic is not repeated.

The nature of the beast

I think there are perhaps two major lessons we learned. The first is that what industry has accomplished arises, ironically, from familiarity with the pathogen. Until recently most of us hadn't seriously encountered Cobweb as a major disease problem, so that the sort of information available and, as a result of that, responsive action required, just wasn't possible. In many instances, therefore, the infection became very serious, extremely rapidly and thus

difficult to quickly reverse.

An interesting aside to this comment is the chastening realisation that became apparent after looking at internal disease incidence diaries. This was that for several years prior to the epidemic there were clear warning signs that the disease had already emerged from the obscurity in which it had previously hidden.

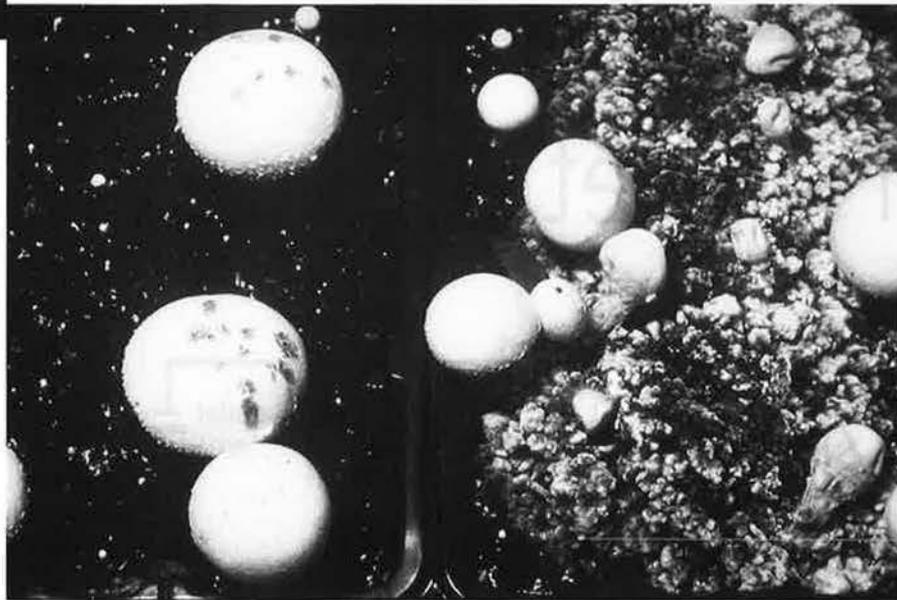
There is still much we don't know about *Dactylium* and that is being addressed currently by an HDC funded studentship, but we have learned, at a cost, how rapidly it spreads and how much spoilage by cap spotting it can cause. As a result we take much more effective hygiene control measures.

Pesticide control

Undoubtedly the second major factor in gaining control, at least for the moment, has been the wealth of information produced concerning the resistance of different isolates to Sporgon, Bavistin and Hymush. Very few growers are now uninformed concerning the resistance profile of their particular strain of *Dactylium* or the possible complication of carbendazim (Bavistin) breakdown in the casing.

The search for precision use of pesticides continues, again under the auspices of the HDC. Recently completed work has been aimed at more effective use of Sporgon and the





Dactylium (left) cap spotting, (right) Cobweb on casing and mushrooms.

occur but I'm afraid it's inevitable as it is the most potent and perhaps the most difficult component of problem solving.

Conclusion

On that note I'll conclude by saying that to my shame I now think we could, or should, have anticipated the outbreak before it became one. In one of the 1995 issues we explored the reasons why *Dactylium* had emerged from obscurity to prominence so rapidly. The reasons for it, I'm still convinced, were correct but it wasn't that sudden. It stopped being an eccentric or autumnal problem at least five years before it became an epidemic.

But then, if it had been anticipated and prevented, we wouldn't all be as clever now as we are, would we? Then again that's the frailty of the human psyche isn't it. We need to learn to really value prudence as much as heroics and on the whole we haven't yet done so.

identification of completely new pesticides. Work planned for 1997 will enable even better use of resistance information.

A model problem

I suppose I'm still searching for the real lessons to be learned from this recent epidemic.

The obvious one is that quick reaction by the industry and R&D, in concert, can subdue even a novel and acute problem such as this. Another is that continued effort is required to maintain that situation once it has been achieved. More knowledge of how *Dactylium* and pesticides behave will be of great assistance as, of

course, will new chemicals should we be able to develop them. But now that we grow in such a way as to favour *Dactylium* a constant reminder of what could happen if we become a little negligent must be an integral element in subduing the problem, by anticipation. It's rather off-putting how often that word seems now to

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Ventilation – inlet and outlet

by Ken M Lomax

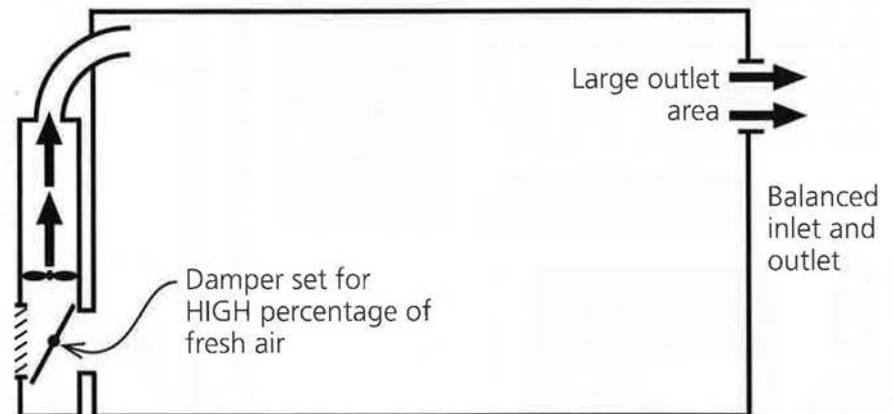
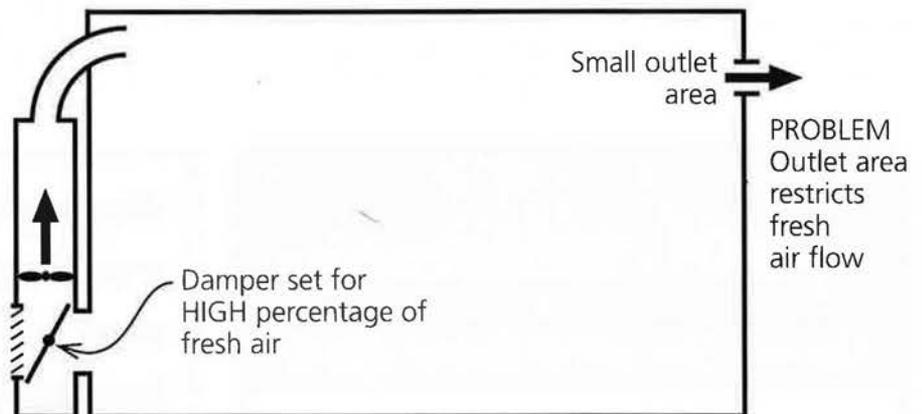
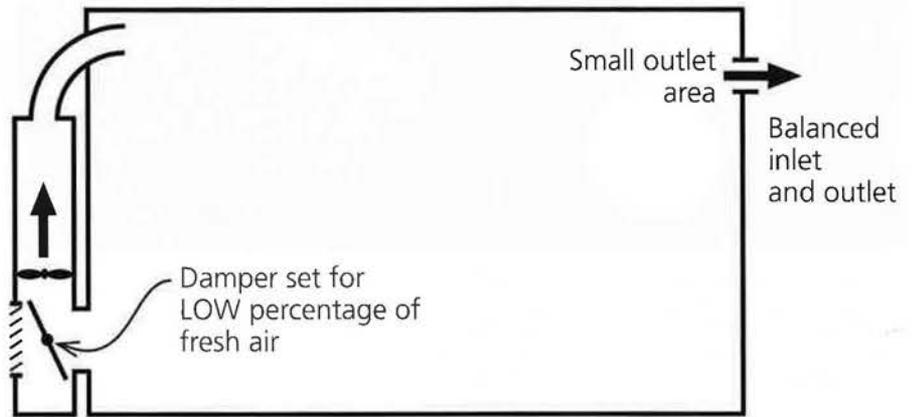
Department of Agricultural Engineering,
University of Delaware, USA.

You have probably heard the saying: "What goes up, must come down". Maybe you are aware of the short form of the fluid continuity equation: "What flows in, must flow out". I want to use my own phrase for the continuity equation applied to air systems: "What can't get out, won't go in". The message of this article is that ventilation inlets and outlets work together, not independently.

First, let's use water for a visual aid. A small stream of mountain water is flowing down the hillside at 2000 gallons per minute (gpm). If we build a solid dam across the stream, then the water can't flow down the hill until it overflows the dam. If we put a pipe in the bottom of the dam to handle 500gpm, what will happen? Yes, water will flow down the hill at 500gpm and also will fill the lake above the dam and then overflow. Now if we put in a pipe to handle 2000gpm, the water will continue down the hill as if there was no dam. Only if the flow would exceed 2000 gpm would there be any accumulation in the lake. At the other extreme, if we build a dam and put in a pipe capable of 2500gpm then the pipe is not fully used and the dam has no value.

An airflow system is a closed container rather than the open container like the lake above the dam. With a closed container, there is no space for filling or storing air. In order for air to come into a room, there must be some outlet or hole for the air to go out of the room. In the liquid example above, a small pipe in the dam caused water to be stored in the pond without decreasing the inlet flow; however, a small outlet for air leaving a room will restrict the amount of air entering that room. Only the flow (cfm) allowed out, will go into a room.

An important term for understanding air flow is 'static pressure'. Within a room, there needs to be a small pressure, either positive or negative, in order to drive the air into or out of that room. Static pressure, measured in inches of water, is a small pressure that we cannot feel with our body. You



might observe static pressure when opening a door. If there is a positive pressure in the room, the door will be forced open slightly by that inside pressure. If there is a negative pressure in the room, the door will be more difficult to open or might close with a slam.

The management of ventilation requires that the inlet area and outlet area be balanced so that static pressure within the room is relatively constant. Balancing means that when more fresh air is called for (e.g. pinning) that the inlet and outlet are both changed to maintain the static pres-

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sure. The diagrams help to emphasise the balancing concept. There should be some controllable outlet shutter or ventilator slide. It is even possible to purchase automatic shutter devices that control area according to a static pressure sensor.

There are two physical limitations that need mention. A fan or blower has

an upper limit of static pressure. At the fan limit, the flow through a room may not change even if the area of inlet or outlet should change. Also, not all of the air flow areas are readily visible because porous walls and cracks around doors are part of the inlet/outlet area. At low flowrate, these dispersed and un-controllable outlets can

allow ventilation without an intentional outlet. At a high flow rate of fresh air, a large outlet area is needed in addition to the porous wall and cracks for air escapes.

Remember, you need to balance the inlet and outlet so that the ventilation flowrate will provide the desired volume of fresh air.

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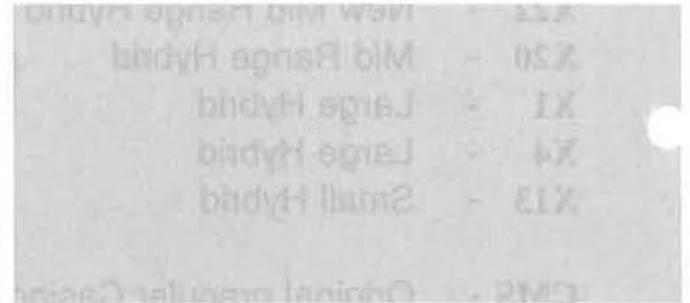
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Obituary – The Late Mr. Gerard Barker



On 21st January, Hensby Composts Limited and the mushroom industry lost a good friend when Gerard Barker died following a gallant struggle with cancer. He was 56 years old.

Mrs S C Hensby writes: Gerry joined Hensby Composts Limited in 1972 as Cost Accountant, and in 1992 became Managing Director. He has been of inestimable value to us during that time and had become well known in the Mushroom Industry.

Members playing in the Allied Trades Annual Golf event will remember that his organisation and personality were always an asset to the occasion, combined with a typically Scottish sense of humour. When he stepped in as Honorary Treasurer of the Mushroom Growers' Association, he became more widely known and liked by the members.

He was a devout member of his Church, which sustained him through a long and painful illness and which obviously helped to mould him into the forthright and loyal person he was.

We mourn the loss of such a determined and honest member of our Company and the community. He will be sorely missed.

He is survived by his wife, Elizabeth and three children to whom he was devoted.



Obituary – The Late Mrs. Patricia McLaughlin OBE

Mrs Patricia McLaughlin died recently aged 80.

She was, for about six years from 1966 to 1972, Public Relations Officer for the MGA. At the 1972 Annual General Meeting of the MGA, held on 22nd March at the Park Lane Hotel, Piccadilly, London, her work was described as 'outstandingly successful'. After her comprehensive review to the meeting of her work of the MGA's publicity department she was loudly applauded. Later, at the Luncheon which followed the Annual Meeting, MGA Chairman, Joe Longhill, presented her with a gold chain and locket in recognition of her services to the Association.

An idea of the work done by Patricia McLaughlin and her department can be gained by reading the

various reports presented during her stay with the MGA in the Association's Bulletin. They record an impressive sequence of Displays, Cooking Demonstrations, Films, Booklets, Talks, Exhibitions, Cookery Competitions, County Shows and Press, TV and Radio comment.

Before joining the MGA she was Unionist MP for West Belfast from January 1955 to 1964. Her husband was an engineer and industrialist with connections in Northern Ireland and other parts of the UK. She was Chairman of a Steering Group on Food Freshness from 1973 to 1975, a member of the Housewives' Trust and, for a period of over twenty years until 1985, a Vice-President of the Royal Society for the Prevention of Accidents.

She was appointed OBE in 1975.

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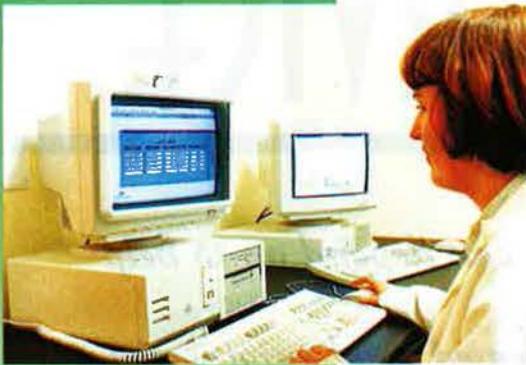
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