THE Mushroom JOURNAL

OFFICIAL JOURNAL OF THE MUSHROOM GROWERS' ASSOCIATION
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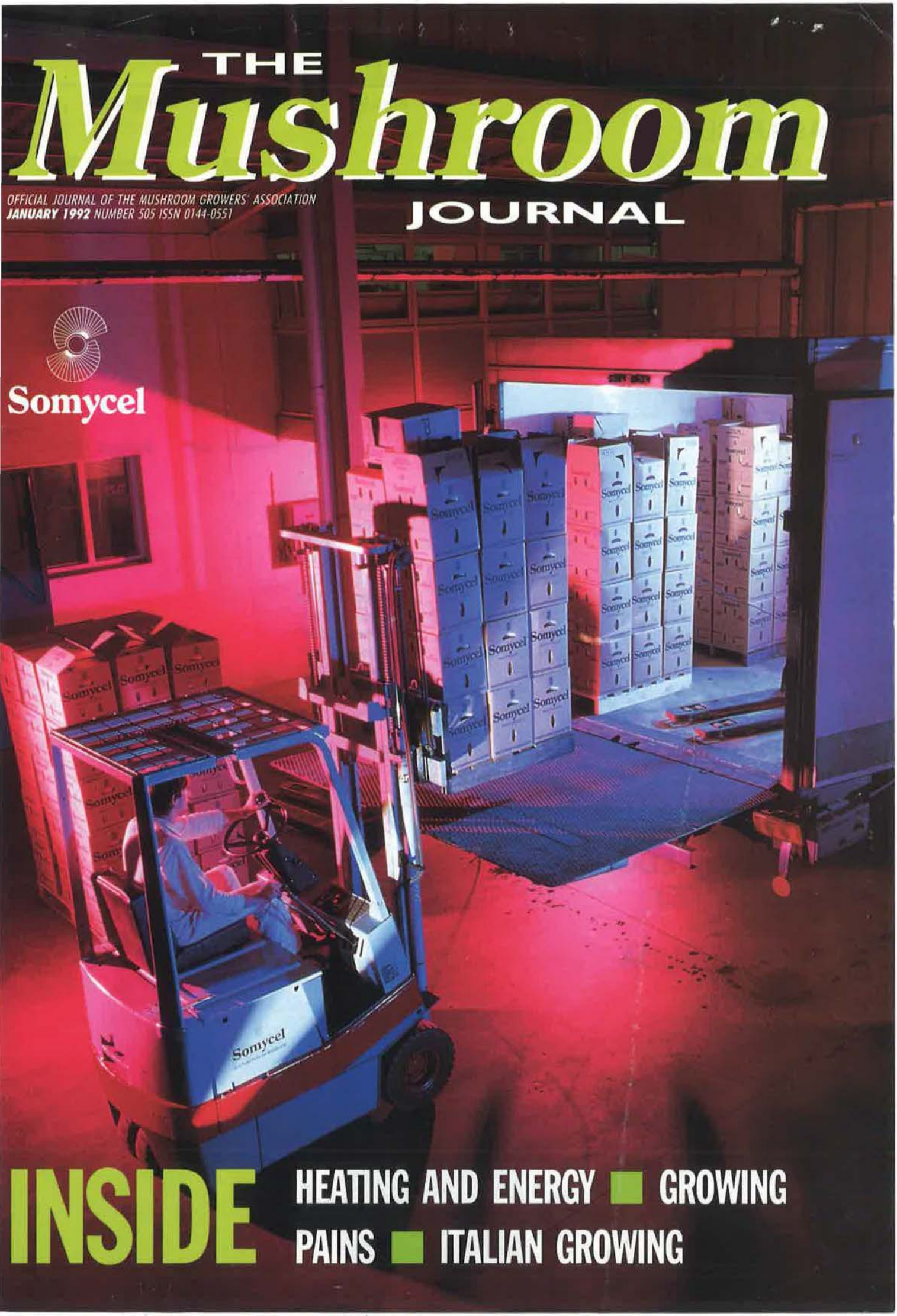

INSIDE

HEATING AND ENERGY ■ GROWING PAINS ■ ITALIAN GROWING

Somycel STRAINS

		MILLETT	RYE	PELLET
AGARICUS				
— SMOOTH WHITE			*Somycel 521*	***Somycel 521P****
		Somycel 191		
	Bitorquis	***Horst K26****		
	Hybrid	*Horst U3*	*Horst U3 SS*	***Horst U3P****
	Hybrid	*Somycel 112*	*Somycel 512*	***Somycel 512P****
— WHITE			*Somycel 611*	
	Hybrid	*Horst U1*	*Horst U1 SS*	***Horst U1P****
	Hybrid	*Somycel 209*	*Somycel 609*	*Somycel 609P*
	Hybrid	*Somycel 205*	*Somycel 605*	***Somycel 605P****
	Hybrid	*Somycel 208*	*Somycel 608*	***Somycel 608P****
— CREAM		*Somycel 344*		
			Somycel 765	
— BROWN			*Somycel 856*	***Somycel 856P****
PLEUROTUS	*Ostreatus*	***Inra 3001****		
	Ostreatus	***Somycel 3004****		
	Pulmonarious	*Somycel 3014*		
	Pulmonarious	***Somycel 3015****		
	Colombinus	*Somycel 3030*		
	Ostreatus	***Somycel 3035****		
	Cornucopiae	*Somycel 3040*		
	Eryngii	***Somycel 3058****		
	Ostreatus	***Somycel 3100****		
	Sporeless Hybrid	***Somycel 3200****		
	Sporeless Hybrid	***Inra 3300****		
PHOLIOTA AEGERITA		***Somycel 4021****		
COPRINUS COMATUS		***Somycel 4030****		
LENTINUS EDODES (SHII-TA-KE)		*Somycel 4055*		
		Somycel 4065*		
LEPISTA NUDA		***Somycel 4101****		

***ON FIRM ORDER**

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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 Mushroom JOURNAL

January 1992 No 505

EDITORIAL

Usually each month we use this editorial space to introduce our special topic. But as January is traditionally a time for taking stock – and, if we are wise, looking forward – this issue looks back at some of the MGA work of the past year, hoping to stimulate ideas from members on the work they expect from their Association. All members are asked to look forward, to ensure that the new MGA which comes out of the working party report really does reflect *your* needs.

Do not wait until the propositions for change come to the AGM on Wednesday 22 April, before asking questions. Help to shape your industry organisation now.

★ ★ ★

Is it significant that when talking to some smaller grower members about attending area meetings, Angela is often told: "I do not have the time, I am not able to get off the farm." If this is true, then as for any of us who ignores outside factors affecting our business, life will become even more difficult.

Changes, often helpful, are discussed at area meetings, so make a New Year Resolution to come and tell us what you expect from them. The subjects, speakers and times of the meetings are entirely in the hands of growers – so contact your area chairmen. They will listen to you. So will we!

★ ★ ★

The office has received a report on a food marketing seminar chaired by the Prime Minister. It concluded – yet again – that "producers need to turn their attention towards the market place..." Group Marketing Grants were announced to help achieve this. The MGA is asked to give views on the proposals, which are worth £5.4 million over the next three years.

The few medium and small growers who have taken small steps in this direction over the past two years report that they DO obtain benefits. Copies of the proposals are in the MGA office if any member wants to offer an opinion. After consultation with office holders and the M&P members, the MGA will be passing its views to MAFF by 31 January. We promise to do everything to promote your interests but we do need your full support.

INSIDE

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The MGA shared a stand with other fresh produce purveyors at the BBC Good Food Kitchen and Cooking Show at the National Exhibition Centre, Birmingham, from November 7th-10th. Over 34,000 people visited the exhibition, which exceeded even the organisers' expectations, and around 15,000 recipe leaflets were given to eager mushroom cooks. The MGA staff sharing this very hectic experience offered around 2,400 mushroom tastings to the ever-hungry crowd, who were all amazed at the taste of *really fresh* mushrooms. Many thanks indeed to Frank Stewart-Wood for supplying the MGA stand with his excellent mushrooms. What exactly do you feed them on Frank? Pictures show visitor to the stand, Michael Barry, slicing a few mushrooms for his television programme, and the MGA team: Angela, Cecilia and Nicki, who were also helped by Lisa and Victoria Lloyd-Davies.

New Produce Manager for James A Gooding

Cate Alexander has been appointed produce manager for Peterborough-based James A Gooding Ltd, coming from Management Development Services (MDS) Ltd, an organisation set up by a consortium of companies to train graduates for management careers in agriculture and horticulture.

Goodings is a member of the consortium, and previously employed Cate on an eight-month training secondment in 1990.

"Our membership of MDS means we can work with graduates as part of their training, and later, if an opportunity arises, recruit as managers those whom we have already tried and tested, and know will fit into our management team," explains Guy Gooding, production director. "In turn the graduates gain an in-depth knowledge of management in these industries, and know exactly what they are committing themselves to when they accept a permanent post."

Cate will be responsible for the harvesting, packing and transport of the mushrooms grown at Gooding's three farms.

Dutch Open Days

Dates Wednesday March 11th-Saturday March 14th 1992. The MGA will be organising a visit to the Dutch Open Days. The programme will involve a visit to the exhibition, the research station and CNC. We shall also arrange additional technical visits on the Thursday, including a visit to a farm. Cost will be in the region of £365 per person sharing a double room.

Included in the price will be:
- Return ferry crossing
- All transport in Holland
- Three nights' accommodation at the Novotel with breakfast
- Exhibition
- Technical tours
- Dinner at the Novotel Wednesday evening
- Special party at De Pannenborg, Thursday evening
- Dinner Friday evening (to be arranged).

This represents excellent value as it will be an information-packed tour with something of interest for everyone connected with the mushroom industry.

To be sure of your place contact Marion at the office NOW.

DIRECTOR'S NOTES

Ken James

A happy and successful New Year to all our members

MGA SERVICES TO MEMBERS

I ended 1991 with news of the Executive's decision not to increase subscriptions for 1992. I also asked for ideas to help the working party reflect what our members – all of them – seek from the MGA. When you read this, the working party will have already gone a long way towards making their recommendations to the February Executive.

Their review is searching and in the present poor financial position – for the industry and the MGA – it is vital that you make your views known, if there is any area of work which you consider essential for the future – and is worth paying for.

The summary of 1991 MGA activities in this Journal can only give a flavour of the multitude of issues handled. Those for individual members have not been listed, for many of them are of course confidential to that member.

Part of the MGA's resources come via the NFU. We have come to an arrangement with the NFU, which will have resulted in all British members receiving an NFU membership card. Your MGA membership entitles you to:

- Receive the Mushroom Journal each month.
- Personal service on all aspects of your mushroom business, through contact with the MGA office. Sometimes we will use colleagues in the NFU to offer advice. This gives us a massive resource to call upon.
- Legal aid, through the subscription paid direct by the MGA to the NFU's scheme. This past year, several members have received advice and cash assistance towards legal aid.
- Access to the NFU Mutual insurance cover, using your NFU local office.
- Participation in any activity organised by the MGA; especially area meetings, conference and the AGM.

Many of the benefits of membership, which come through our contacts with UK government, EC Commission, European growers' organisations and other agencies, may seem remote to your farm.

REGULATIONS come thick and fast and they all affect your business costs. In the first three months of 1992, the MGA will be involved in consultations with other organisations and the Health & Safety Commission, on SIX new EC directives. Our government will implement them fully. You may remember that at Maastricht John Major made the point that all EC members should also ensure that they apply directives more rigorously. Back to level playing fields again.

The MGA exists to serve you, our members, wherever you are in the mushroom world. Your support – your views – can ensure that we will be structured and financed in the way which is best for our industry.

"LE-LION" CMS

Casing Mycelium Supplement

In response to increasing pressures on growers for consistency of quality and of crop timing we are pleased to introduce a new casing spawn supplement to complement and enhance our existing spawn range.

"Le-Lion" Casing Mycelium Supplement (CMS) has been developed specifically for this purpose providing a safe sterile alternative to traditional compost-based CACing materials.

CMS is manufactured under completely sterile conditions to the exacting standards which "Le-Lion" maintain for all their product range, as one of the world leaders of quality spawn production.

CMS is a granulated product which allows it to crumble easily during application at casing. It is available for the following strains.

GRAIN SPAWN		CASING SUPPLEMENT	
X 1	Off White Hybrid	CMS 1	
X 13	Pure White Hybrid	CMS 13	
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C 9	Brown variety	CMS 9	

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Geoff Ganney's GROWING PAINS

1st November

Re-checked spawning rates and to our surprise (or maybe not!!) the level of eight litres/ton we expected to be using was only six litres/ton.

What is the best rate? What is the optimum number of days from spawning to casing? Or do you expect there to be a different time for various mushroom strains? The effect on crop timing could be most significant as for some time we have been airing up later so delaying first break picking and total flush numbers. Probably answer why Richard Green tells us we should air up after six days when using casing mycelial supplements!

3rd November

Still think we need more accurate data on strain relation to compost, casing and watering regimes. We seem to struggle with the off-white hybrids we are growing in getting the watering correct for the later flushes, normally ending up being too wet too soon to get the best pin formation. Basically this is brought about by attempting not to water over mushrooms. Why do that? Do what; not water over mushrooms, or yes, do water over mushrooms?

4th November

Several trays showing wriggling eelworms in isolated patches on the casing at first flush. Certainly this is where we have some wet compost and subsequent poor mycelial growth. Using low-kill temperatures at phase II has always made us cautious of eelworm possibilities. So far there has been little evidence of them appearing, but if one cultural factor slightly changes then they can show. Poor quality processing rooms don't help! But, then, I have heard on so many occasions how eelworms become established under compost preparation in **new bulk tunnels.** Uniformity, is that the answer...?

5th November

Continuing discussion with other growers about the problem of sciarid 'flies' and their continued persistence around farms. You'd believe chemicals were hardly acting to control them. Maybe they are not! No doubt following the past hot summer with muggy warm autumnal conditions this will have encouraged the movement of flies around the farm. Poor compost selectivity has always given us more problematic crops where for some reason subsequent higher outbreaks of sciarids seem to have occurred. (That reason maybe slightly high ammonia levels at spawning!) Any answers?

6th November

Somewhere will come a new breed of 'hybrid' mushroom strains; the time cannot be too far distant. Such an event will again take the industry a huge stride forward in the **'quality'** and **production** stakes. Those with the right production facilities will extract both increased **'quality'**and **'output'.** Others with systems that subject production to numerous limiting factors will gain only on one factor, **'quality'.** In times of continued increasing financial pressures it will be necessary to gain on both fronts. Why can't we use cultural techniques to obtain both goals without having to wait for such new hybridization? Without aggressive commercially-based investigative development work, such a stride is most unlikely. The days have gone when grower-innovators could constantly try to improve major productive areas such as compost or casing improvement. Today their effect has been greatly minimised. It is called **'Economic suppression'.**

7th November

Still embroiled in re-calculating our spawning rates. Questions as to days from spawning to casing seem to be as irrelevant as the question of the correct spawning rate, when you are using added casing mycelial additives. Can you imagine the permutation? Spawning rate x casing date x strain x make of spawn x mycelial carrier x casing mycelial supplement. You thought it was simple!!

8th November

It is of continuing surprise to me how so many items purchased for use in the mushroom production do not come up to standard. Whose standard? **That set by the individual producer to meet the needs of his business.**

10th November

How come if a mushroom doubles its size every 24 hours, sometimes it doesn't grow and other times it explodes? Decided to pipe evening prayers through the tannoy system on an hourly basis throughout the night. Should then be able to market them as 'Most Holy' mushrooms, particularly if we have increased Sunday sales with Sunday trading.

11th November

Poorly-anchored mushrooms brought out the hand lens (once we could find it!!) to see what, if anything, had been feeding around the base of the stipe. No obvious symptoms of mites, yet you had the feeling it just could be a result of mite feeding. No basal discoloration or pit formation. After several minutes examination one had to come to the conclusion that there were no obvious mites present. Yet another unsolved mushroom anomaly. Still it is true that mites are some of the least understood of mushroom fauna. Checked phase II kill temperatures.

12th November

Having rarely travelled into West Sussex in recent years it came as no surprise that I lost my way when going to the HRI mushroom open day!

How can you do that when you worked there for years? Most impressive turnout of people to the morning sessions which ranged over the numerous topics under investigation at the centre. It was very refreshing to listen to well-presented, clearly thought out and professionally delivered papers which without exception provided much data for one to think upon. The commercial gap is today far greater than in former years due to the constant economic pressures placed on the mushroom producer in his search to support his market place.

In personally bridging the gap in transferring from an academic way of life to the fantasy of commercial mushrooom growing back in 1973, took me, an **apparently** commercially-thinking ADAS adviser, some years to adjust.

Some would say it has never really happened!! It is a strangely aggressive place to be.

13th November

Spent most of the day at the MGA office in working on MGA affairs or trying to understand some of the more contentiously political aspects.

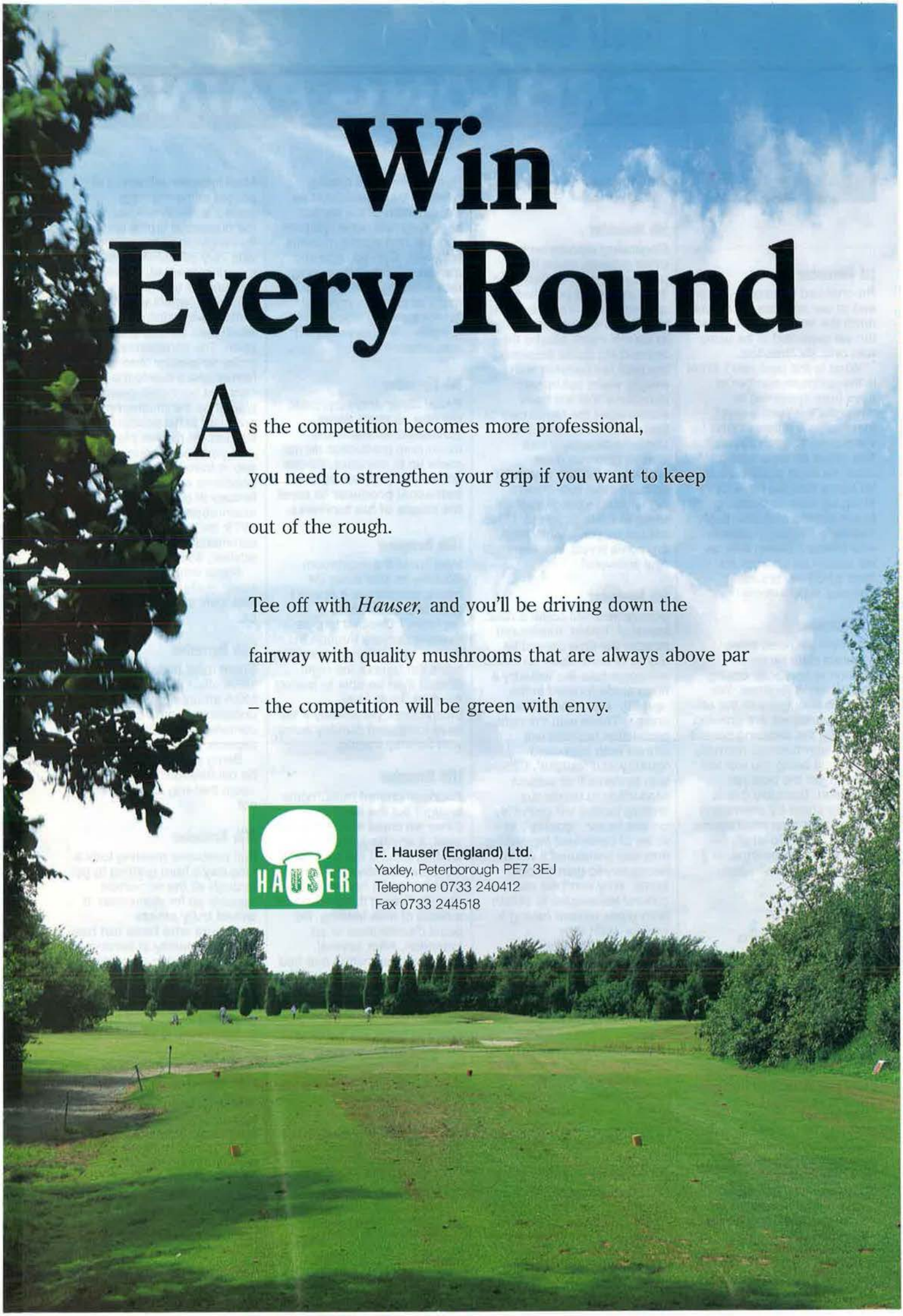
Being a grower, much can be cut through. Well, it would seem that way, but in fact, is not.

14th November

Full executive meeting took a long day's hard grafting to get through all the numerous aspects up for discussion. It **would truly amaze members who have not had the opportunity** of serving on the full executive committee, not only the enormous effort put into running the association but the diversity of subject matter that has to be absorbed, digested and acted upon.

15th November

Reading John Gummer's announcement of 'Group Marketing Grants':
"The **Group Marketing Grant** we are introducing will contribute 50 per cent of the key management expenses in starting, group – feasibility studies, legal costs, chief


Win
Every Round
As the competition becomes more professional,
you need to strengthen your grip if you want to keep
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Tee off with *Hauser,* and you'll be driving down the
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executive's salary and training of directors. It will similarly contribute towards consultancy advice on the expansion and development of existing groups."

Need more notes as data filters through the system.

17th November

We have decidedly reduced hygiene chemical purchases and the set programmes specifically aimed are totally selective, *ie*, related to a **specific chemical** for a **specific problem.** This appears to be working but it most certainly relies on good management practice and has little room for error.

18th November

Torrential rain managed to create a vast overflow of our 'Goody Water' catchment areas resulting in flooding the surrounding fields.

Fortunately no leachate found its way into the feeder streams but it just highlights how the extreme can catch you on the hop. Allowing for the worst situation is not just possible in economic terms but necessary for environmental needs.

19th November

Spent two hours trying to reduce dwell-time on the press at the spawning operation and unable to get less than two seconds. Why? Really not keen on ramming too much compost into a hard tray-size block.

Others do so without any detrimental results; yet it doesn't suit our method of growing. Possibly due to our high compost moisture levels at spawning?

20th November

The range of available peats seems to be expanding as awareness of peat (specific types) for mushroom casing mixtures has grown. Prices seem to be another factor and with even more samples arriving today this is occupying my mind. Think peat...

21st November

Good turnout at Grantham area meeting to hear John Smith and Paul Danahay carefully describe the whys and wherefores of "Growing and Marketing Techniques for Satellite Farms"; in this instance being in a three-shed unit holding 11 tons of compost in plastic bags. The success seems startling and for sure will be followed with great interest by many in the next year or so.

22nd November

Desperately juggling with casing dates and spawned casing rates to avoid what can only be described as a tricky Christmas week. You mean you could think of some other adjectives!!

23rd November

This question of peat volume in relation to a total casing mix in relation to overall costs is fascinating. What is a litre in relation to compressed, freshly-milled or wet rough-dug peat? Where is it measurable – at source, at depot or on the farm? Ramifications of, if it is pre-mixed at varying moisture levels, open up a whole new ball game. No doubt numerous comments will follow...

Now sure we need a whole **advertising feature** just on peat.

24th November

How can you make those who should be accountable for daily events on a repetitive basis become so? It would appear that the ratio of pressure to thought is continually small. Next year will be action accountability year (AAY).

25th November

Yes (AAY) must start at the top.

26th November

Strange grey mould growth in a couple of bags of spawn prompted me to send a sample to Doc Fletcher! 'It is only a species of Alternaria which is common in the environment being known to cause sooty mould in wheat, not really of too much significance'. Maybe we are now too observant, inspecting every bag of spawn and having shelf-life samples. But we will still continue to do this.

27th November

Trying to get the compost stack sizes up in hope of creating a higher temperature range across more of the compost. Seems to have become reduced in size after adjustments in late summer in order to cut back the anaerobic core. Looks as though we need to change some of the machine characteristics for the front-stacking phase or maybe just beef up the pre-wet moisture.

28th November

New growing sheds at Marigold have now completed the first round of crops with a favourable degree of success. The obvious teething problems have occurred and with the usual breakdowns but it looks as though very little modification will be required. Other than doors, ducts, heating, humidification, temperature control, drainage, exhaust fans and lighting. We are generally pleased!

30th November

Time-O-Bio/AG 'Sorbent Super Slurper' details arrived in the post giving data of their USDA licensed product. *Developed by the US Department of Agriculture and fully documented on both performance and ease of application, we are now able to offer you our TIME-O-BIO/AG – Sorbent Super Slurper, a unique product which when blended with Mushroom Compost, will contribute to at least ½ to 1lb increased production per square foot tray.*

There is much more. The principles of water retentive casing additives have briefly been screened and some used. Perhaps trials and data will be forthcoming from such materials...

Happy New Year with goodly (AAY) results.

The rational choice of future-oriented growers.

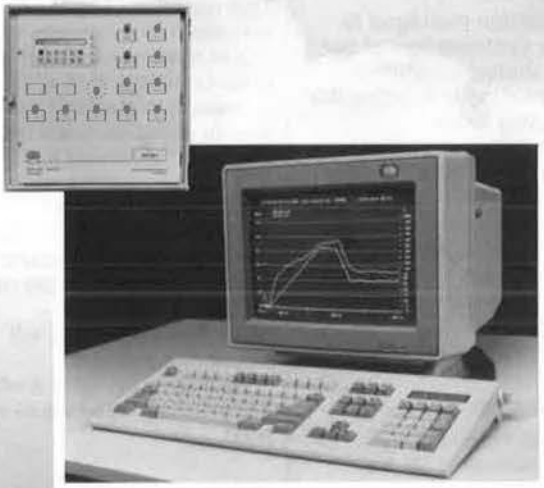
Dalsem-Veciap : a household word whenever mushroom growing requires advanced management.
In both small-scale and large-scale mushroom production.

Of course, this reputation did not come naturally : Dalsem-Veciap owes its success to a unique combination of qualities. We have a thorough knowledge of current cultivation techniques, and skilled staff of our own to realize the buildings, machinery, equipment and automation systems, thus creating the prerequisites for efficient and cost-conscious production. Because of this Dalsem-Veciap is in an excellent position for providing the mushroom growers with an extensive and flexible package of services.

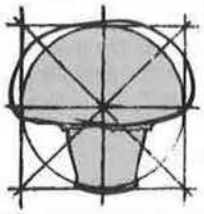
We can supply anything between advice on cultivation techniques and the "turn-key" delivery of complete cultivation plants: we furnish everything, from a simple mushroom knife up to the computer-controlled systems for production monitoring.

VEC Computers champions in champignon growing.

The VEC computer guarantees you optimum conditions for reliable surveillance of the mushroom cultivation process in all stages. After protracted tests in our own experimental cultivation plant the VEC system has started its persuasive advance in both smaller and large-scale mushroom farms.
The system consists of a VEC-12 personal computer centrally located in the farm premises, which is connected with a satellite terminal at each growing room.Thus it is possible to control the conditions for the individual rooms.



If you want reference addresses or more detailed information about the specific possibilities for your firm: don't hesitate to contact us.



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OUR RESEARCH IS YOUR SUCCESS

AN MGA CONFERENCE FOR EVERYBODY

Book the dates now ★ Friday 25 and Saturday 26 September 1992.
Venue ★ Cambridge and Chesswood, Shepherd's Grove (Bury St Edmunds)

BEST VALUE EVER – FOR TECHNICAL AND PRACTICAL ADVICE

The Executive has decided on an imaginative new format for the Conference. Both days are a must for all members, large and small, and key staff.

- All of the Conference will be aimed at practical mushroom growing

SATURDAY ★ TRADE FAIR ★ FARM WALK ★ SURGERY SESSIONS

For the first time, the exhibition and farm walk will be held on Saturday, at Shepherd's Grove, by kind permission of Miles Warnick, Managing Director of Chesswood Produce.

This promises to be a fascinating day offering an opportunity to look over one of Britain's premier mushroom farms with guided tours by Chesswood technical staff, who will be happy to answer questions.

The Trade Fair will have the added attraction of large machinery on display outside the marquee as well as a variety of trade stands from the UK and overseas.

A new feature will be the "surgeries" where small groups, or individual growers, can discuss their problems or ideas with an experienced grower, allied trades member or scientist.

FRIDAY THE LECTURE PROGRAMME

Geoff Ganney, The Chairman elect for 1992, expects to "encourage":
Tim Haynes – an experienced grower, bur fairly new farm owner, to deal with his experiences – "Can You Handle The Product?".
Richard Tite – ADAS Mushroom Adviser, based in Harrogate – "A Mushroom Adviser's Year".
Miles Middlebrook – another new farm owner with years of experience – "3 Steps to Heaven – Growing By Numbers".
Dr John Fletcher – ADAS, Wye, Plant Pathologist – "Is There A Doctor In The House?". This will be John's swan song, for he retires shortly.
Peter Munns – Well known grower and supplier of supermarkets, who always speaks his mind – "I Have Had That Problem".
Bob Pinkerton – A doyen of the UK mushroom industry, who is still confident in the future and has installed a new picking system – "Speed With Quality".

The Sinden Award Lecture
The day will end with a small panel of well known growers, entitled – "If I Could Do It Again".

IT REALLY IS A DAY FOR EVERYBODY, SO DO NOT MISS IT

MAKE A NOTE – 25 and 26 SEPTEMBER 1992

Details of accommodation at all prices will be available soon.
WATCH THIS SPACE

Heating and Energy Conservation

By Robert Brown

Heating a mushroom farm has come a long way since the 50s when my father started growing mushrooms. As a nine year old I can remember going into our one cropping room with him to stoke a solid fuel fire. This fire to this day still seems in my mind to be an early fuel efficient system. The fire stood about six feet tall and two feet square, there were four ducts fifteen inches by three at a thirty degree angle on alternate sides going from one side of the boiler to the other. Air moved through the ducts making sure that too much heat did not disappear into the wide blue yonder. The Peak Heater was supplied with steam from a vertical cross tube steam boiler of enormous proportions. Fuel, mostly wood, was fed through a door that could accommodate a fair size tree trunk and it had to be checked every hour for water level and steam pressure. All this for a room 28 x 22 x 7ft; this stared energy conservation in the face without a trace of lagging in sight.

These were the days when a hole in the wall was the only form of ventilation without a fan in sight. Crops of 1.5 pounds picked in 8 to 10 weeks with none of the problems of CO_2 build up. Because of this energy was not a huge cost item.

By the early 60s we had four cropping rooms all with a solid fuel fire in the corner but now with a 16-inch Tornado fan circulating the air. Still all very simple and cost effective. My father would go to Nottingham in a 5-ton 1952 ex-Southend-on-Sea Urban District Council Bedford bullnose Tipper to get steam coal and a heap of pollution which seemed to come with it.

Energy conservation came in the form of one inch of polystyrene which lined the inside of our 50 x 20ft rooms.

In 1965 the solid fuel fires were replaced with a 133,000 BTU Beeston Robin Hood Junior hot water boiler. This was purchased second-hand along with a selection of out-of-production radiators. Five radiators were installed in each room. The change in the system was required because of that old work driver 'progress', spawns were becoming more productive, we were more productive and so was CO_2. The capital costs were low and the running costs were low as we burnt scrap wood during the day and coal at night.

Energy input grew as more mushrooms needed more ventilation which needed more watering which needed more heating ad infinitum.

In 1969/70 we made the decision to change from fish boxes to trays. This brought with it another increase in yield and more demands on energy with a constant problem of keeping water levels up using such a localised heating system.

Soon after this in 1971 a local grower shut down his farm and we acquired a one million BTU Mercury steam boiler and five Condair mixer boxes complete with fans, all only two years old. At the time I remember feeling like a child with a new toy, going into the boiler room each morning and blowing down the boiler, sight glasses and water level control. This was cost effective; plenty of good quality mushrooms because of the injection of steam to increase humidity and less man-hours to keep it running. The down side was a more complex piece of equipment to go wrong and a higher maintenance bill.

Cost efficiency went out the window when the Arabs decided that the Western oil companies had been extracting the Michael by calling it oil instead of liquid gold. Now it meant that a farm could not be cost effective unless it was energy efficient. We installed Rockwool bats two inches thick above the ceilings in our cropping rooms. Cut back the amount of air on the coldest of days going through the rooms and kept the doors closed when going back and forth. Everyone was in the same boat so it made it easier to adjust.

Come the 80s a new form of heating to the mushroom industry started to raise its head, heat pumps. Denis Locke in his director's note, "Energy and You" in the June 1980 Journal mentioned a talk given by Professor Keith Morgan at the Eastern Area Meeting on the principles of the heat pump. In the same issue an article on Norman Cooper's farm with eleven heat pumps showed savings of 75% on costs of energy over his previous system. Peter Munns had the same level of savings writing in the June 81 Journal. The following June's issue reported the same from Leon Kavell's farm.

My father and I were convinced that this would be the direction to go when we next looked at our heating system. During 1983 we began to cost the change over, this ranged from £10,500 to £22,500 for five units. After looking at some of the installations on other farms we decided to do it ourselves. We bought five Lennox CHP9-413 single-package heat pumps direct from Lennox, designed our own trunking all for £8,465 plus electrics at £362. The units were all up and running by the end of spring '84. By this time I had learned a lot about the internal workings of the units as all of the external control system had to be replaced to stand up to the environment in the cropping rooms. The American wiring loom used red cables for single, three phase and 24v DC and there seemed to be enough of them to wire up Blackpool Illuminations.

By mid-summer we could not see how mushrooms could be grown without them. Yields were higher, quality was higher and growing became less of a problem. By the time summer had past a quick calculation showed that the units would pay for themselves just using them over this period in two to three years. Now we would see how they performed in the winter. In the meantime Chris Cock from the Eastern Electricity Board had worked out some figures to show us that a change to our metering from day and night to weekend day and night would give us extra savings. Our costs for electricity the year before the use of heat pumps (1983) was £1773, for 1985, the year after, £2769; not taking into consideration the rise in cost of electricity to run five heat pumps came to £996 to heat and cool 7,200 feet of growing beds and 1,800 feet of spawn run beds; plus cropping had been increased by 50% by increasing the density fill at spawning from 18lb to 22lb and supplementing all year round. For the next three years average yields were 5.5lb per square foot. So even if the cost in running the heat pumps showed no significant saving the yield would pay for them.

In 1986 the roofs of the four cropping rooms were replaced with steel hoops, polythene and 160mm of Rockwool insulation. The benefit of this was noticeable by the ease in which the units worked during the winter whereas the year before they struggled at times.

In the autumn of 1987 I began to plan the replacement of the whole farm. A new and more complex heating and cooling system would be required to produce the quality that was being demanded from the market place. Heat Pump Services quoted a price of £30,000 for six split systems with stainless steel mixer boxes 12kw electric heater banks and electronic controls. Just for curiosity I started to cost the price of a steam system with a central chiller, at £50,000 I gave it up. Steam would be needed to cook-out and for the kill on the peak heat. A mobile steam generator would be used for this; with a 5 minute time to full steam and no pipe work this seemed really energy efficient.

The autumn of 1989 saw the first three units installed on the 56 x 21 x 14.5 foot tunnels. Then a hiccup – HPS went into liquidation leaving me with the problem of completing the next three units. By the June of 1990 I had all the parts for the second set of tunnels this time using Zentronics computerised environment controls. A Dragon Dry Steam Generator was purchased from Wickham Autowash so now I had all the equipment I needed to be fuel and cost effective.

So after a year how has it turned out? First running costs for all the electricity used on the farm – £5,000; not bad for 13,500 square feet of beds, less than 1.7p per pound of mushrooms. Fuel oil used per crop for peak heat and cook-out – 350 litres. I think that some savings can

still be made on electricity. The cook-out could save some if I stopped going to 70°C. every time, say 65°. The 160mm of insulation seems to be about right on the tunnels. I've just taken a tunnel up to 70°C, it's −3°C outside and ice has formed on the roof. All the heat pump equipment has worked well with only the first set of controllers causing the most problems and only niggling ones. I wish the same could be said of the steam generator; this has been from the start a most unreliable piece of kit which is a pity because it is very efficient at producing steam.

Costs in the future will be OK provided electricity does not climb through the roof as it did this year with my night and weekend rate going up a massive 15%. But then again it is such a flexible energy source.

Air distribution in mushroom growing rooms

By H Loeffen

Institute of Agricultural Engineering IMAG, Climate Control Department, Wageningen, Holland.

Summarised by Peter Flegg

This important technical article reveals some interesting insights into the interplay of factors involved in the amount of air entering a mushroom house and the flow of air over the beds. We present here essentially the practical results of the studies, but those interested in the more theoretical aspects together with the bibliography may obtain a copy of the appendix in which they are discussed more fully, by application to the MGA office enclosing a stamped addressed envelope.

Summary

During the cultivation of mushrooms in growing rooms metabolic products should be discharged evenly from the beds to maintain the desirable micro-climate all over the room. This is only possible if there is an equable production of heat in the beds and an evenly distributed air current above the beds.

In practice perforated polythene ducts are often used for air distribution inside growing rooms. When these ducts are used indiscriminately, the uneven air distribution created in this way can have ill effects on the production and quality of the mushrooms. In order to gain an insight into the air distribution a computer model has been made at the Institute of Agricultural Engineering (IMAG) which shows patterns of outflow and air distribution graphically. The results of the computer model have been field-tested. By means of this model new ducts can be designed and the air distribution of the existing ducts can be checked.

Introduction

During the cultivation of mushrooms the desirable circumstances in the microclimate should be maintained everywhere in the room to get a high level of production and good quality. Differences in the microclimate inside the room may be caused by an uneven distribution of the basic materials in the beds, by an unequal influence of the inside climate by the outside climate and/or by an uneven discharge of metabolic products, because the inflow of air is not properly distributed above the beds. Movement of the air in a growing room is caused by free and forced convection.

Free convection is the result of heat production in the beds and depends on the difference in temperature between the air in the growing room and the casing soil. To be able to determine the influence of free convection on the overall movement of the air we have made a model.

Forced convection with polythene ducts is often used in practice for air distribution. If the ducts are not properly deployed, an uneven air distribution can have adverse effects on mushroom production and quality. To gain an insight into the air distribution when these air ducts are used a computer model has been made to show graphically the patterns of the outflow of air and the air distribution.

The results of the computer models for free and forced convection have been field-tested. In this article we shall go into the movement of the air caused by free and forced convection, the computer model for polythene ducts and the possible applications of the model. The data for this have been extracted mainly from B. J. Bailey's (2,3) and A. W. J. M. van der Boomen's (5) research data.

Movement of the air

Literature

The literature contains little information about the requirements that air velocities above growing beds should meet. Only research done by Arkenbout (1) yields data about acceptable air velocities in connection with dehydration and consequent scaling of the surface of mushrooms. According to Arkenbout air velocity should be lower than fifteen centimetres per second at a relative humidity of 80 to 85%. In practice fifteen centimetres per second is commonly adhered to as being the highest acceptable air velocity above the beds.

Free Convection For a discussion of the theoretical aspect see the appendix.

Measurements

In a closed growing room with the fan turned off air velocities and temperatures in the room (Ta), the compost (Tc) and the casing (Tcs) have been measured. When the temperature of the compost (Tc) was higher than the temperature of the air (Ta), an ascending air current could be observed above the beds.

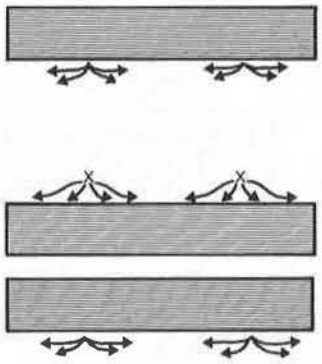

Figure 1 Movement of air Tc<Ta

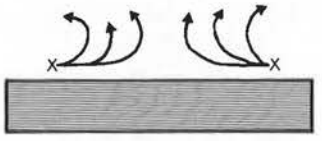

Figure 2 Movement of air Tc>Ta

In Figures 1 and 2 the pictures of the experiments carried out with smoke have been reproduced. If the compost is cooler than the air, the smoke will remain on top of the compost and there will be

Table 1

Natural movement of the air above the beds (in cm/s)						
	Layer 1	Layer 2	Layer 3	Layer 4	Layer 5	Average
Front	6.6		6.5		8.6	7.2
Middle	12.9	8.6	6.1	6.8	7.4	8.4
Back	9.8		5.7		5.6	7.0
Average	9.8	8.6	6.1	6.8	7.2	(7.6)

Table 1 Natural movement of the air above the beds ($cm.s^{-1}$)

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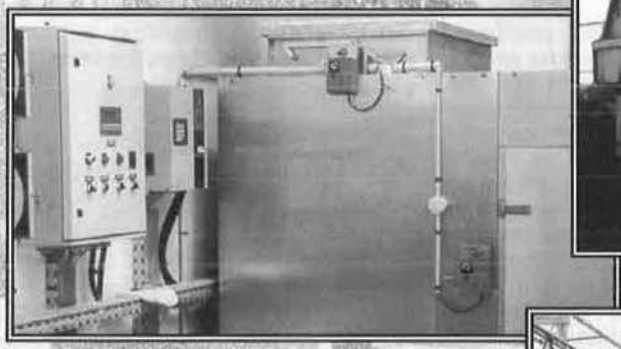

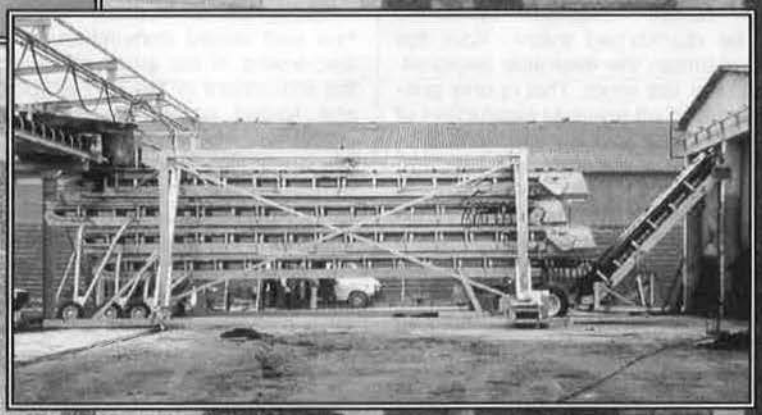

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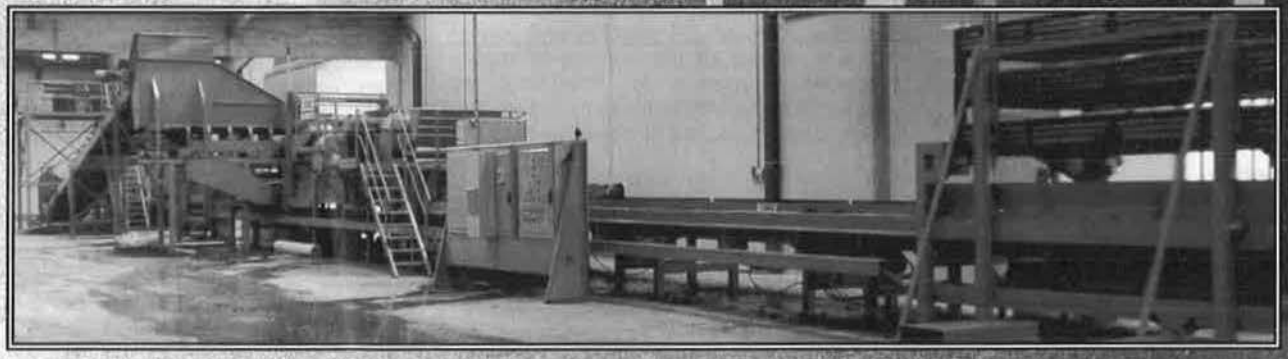


no movement of the air to be observed (Figure 1).

The air velocities brought about by a natural movement of the air can be found in Table 1 and goes for Tc>Ta (fig2).

In Table 1 a situation has been represented that occurs when there is a difference in temperature between the casing soil and the air in the room of 1.5° to 2°C, as is usual during cultivation. While measuring the air velocities above the beds in growing room, the differences in temperature found have not been bigger than 2°C. The air velocities measured above the beds (Table 1) correspond well to the calculated values of the model (see appendix). Ventilation by means of fans is necessary because carbon dioxide has to be removed during cultivation. The influence this forced convection has on the air velocities above the beds in the growing room is dealt with next.

Forced Convection See appendix for theoretical discussion

Measurements

In five growing rooms air velocities have been measured above the beds. In the growing room two ducts are installed up the ceiling and the left and right wall. To blow in the air three perforated polythene ducts have been used. Four different quantities of air have been blown in.

The following quantities have also been measured at places situated on cross-sections of the room (front, middle and back):

- air velocity in the duct;
- static pressure in the duct;
- outflow velocity in the direction of the outflow;
- angle of outflow;
- air velocity above the beds.

For measuring the air velocity in the duct and in the outlet openings a vane anemometer has been used and the air velocity above the beds has been determined by using hot wire anemometers, which are suitable for measuring low air velocities. In the middle of the beds the anemometers have been installed 5 centimetres above the casing soil and along the length of the bed. Furthermore, two vane-anemometers have been attached to the floor at a height of 5 centimetres above the floor under the bottom bed. The angle of the outflow has been determined with a purpose-built instrument before we started measuring. With a video cassette recorder and a monitor, which had been linked up to a camera in the growing room, the movement of the air has been recorded with the help of smoke. The results of the measurements taken in and near the ducts correspond well to the calculated values of the model.

Some typical measurements are shown in Table 2. If we compare these measurements with the ones from Table 1, it is clear that in the most common situation (Q, the total input, = 1,000 m^3/h) the increase in the air velocity above the beds brought about by forced convection

Table 2

Q = 972,4 (m^3/h) Air velocities in cm/s above the beds							
	Layer 1	Layer 2	Layer 3	Layer 4	Layer 5	Average	Underneath
Front	7.2		13.4		22.9	14.5	57.5
Middle	14.0	8.4	11.6	15.3	10.5	12.0	52.0
Back	12.7		5.3		14.8	10.9	46.5
Average	11.3	8.4	10.1	15.3	16.1	(12.4)	52.0

Table 2 Duct A - Movement of air above the beds (forced convection) Dd (duct diameter) 0.42m, Dh (diameter of holes) 0.5m

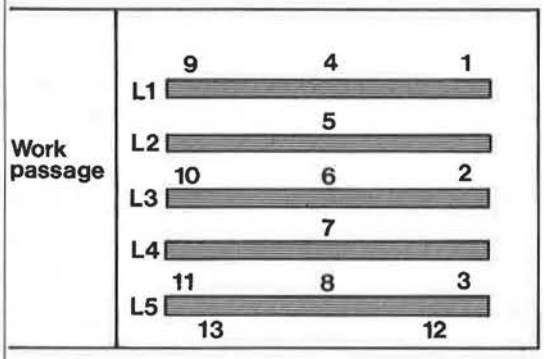


Figure 3a Measuring points of the air velocity above the beds indicated in a longitudinal cross section of the room

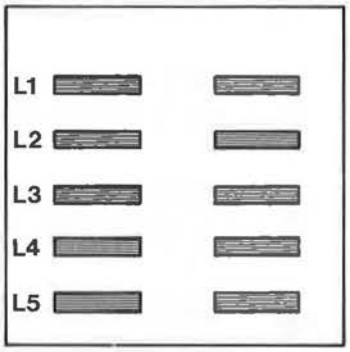


Figure 3b Transverse Cross Section of the room

amounts to *circa* 3 centimetres per second.

Figure 3 shows the layout of the shelves in the cropping room both along the length and in cross section together with the points of measurement.

Consideration of the measurements

A measure of the overall movement of the air in a growing room is the average velocity of the air measured at all locations, a reference velocity.

This reference velocity for three perforated polyethylene ducts has been plotted against the total quantity of air blown in per metre of duct (Qa). Each duct had two, three or four holes per metre length (Figure 4).

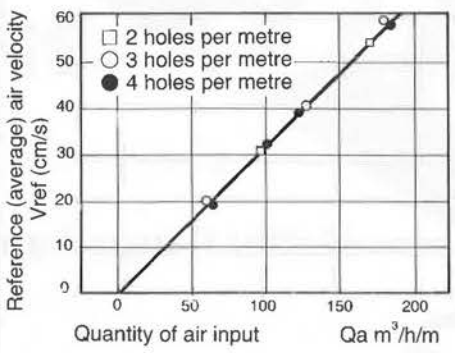


Figure 4 Reference veocity (Vref) as a function of the quantity of the input of air (Qa) for three different intervals between holes (Hi) per metre of duct.

From the figure one can see that the straight-line relationship between the reference (or average) air speed for all locations and volume of air is independent of the number of holes per metre.

If the reference (average) air velocity for all locations in the house is plotted against the average velocity of air above the beds for each of the three ducts, it is shown that the smaller the number of holes per metre of duct, the lower the average air flow over the beds. It follows that the velocity of air under the beds will be increased as the numbers holes per metre is decreased. Mathematical expressions describing these relationships are given in the appendix.

Conclusion

From the measurements the following important conclusions can be drawn.

The natural movement of the air that comes into being above the beds depends on the difference in temperature between the air in the room and the casing soil.

If forced movement of the air is applied by means of perforated polythene ducts, the overall movement of the air will depend only on the quantity of the inflow of air and will not depend on the number of holes per metre of the length of a duct. If the number of outlet openings per metre of duct is decreased, the average air velocity above the growing beds will decline and the air velocity under the bottom beds will increase.

An equal pattern of outflow will come into being, if the ratio of static pressure and dynamic pressure in the front of the duct is larger than 10 and the relative differences in static pressure do not exceed 15%.

ITALIAN GROWING

The Funghi del Montello mushroom operation

By Gerard Derks

The Funghi del Montello company began growing in 1955 when the brothers Angelo and Bruno Sartor built their first farm in Venegazzu with 12 houses and in 1961 increased to 24. In 1963, a second plant was built in Quero with 30 houses. The plant I visited recently in Pederobba was finished in 1966-67 and comprises 64 houses in two blocks. As with all progressive businesses, constant development is taking place.

During the last two years, this plant has been modernised with efficient phase-2 tunnels, beautiful shelves and up-to-date, computerised climate control system. The enterprise is being run by Bruno Sartor's sons and Dr L Bagnasco.

Three weeks of cropping result in an average of 28-29kg per square metre (5.5-6.0lb/sq.ft). Thanks to personal attention to detail and the advanced technology used in this plant and the perfect climate control, the quality of the mushrooms I saw can be classified "first class". It was interesting to observe that all machinery and equipment was produced in Italy excepting the computers, which were Dutch.

Spawn production enterprise

Another activity of the company is their spawn laboratory 'King Spawn' in Quero, founded in 1965. Funghi del Montello use nearly all (95%) King Spawn. The spawn is sold mostly in Italy and Southern Europe. Dr Brini, technical manager, selects his own spawns and also collaborates with an important spawn producer in the USA. Recently, a new bag has been developed for storing and transporting spawn.

Canning interests

Initially set up as a 'safety valve' for excess production, the Funghi del Montello canning factory, after 25 years, is now considered one of the most important for mushrooms. It handles mushrooms not only from their own plant, but also from many farms in Italy and overseas. Customers for the wide range of canned mushroom products are supplied over most of Europe. Montello is a complete mushroom business, which appears well equipped for 1992 and beyond.

The new packaging developed in Italy for transporting and storing spawn which saves space on delivery and even more at the disposal point.

Celebrations in Italy

The Italian mushroom industry are rightly pleased with the receipt by Gerard Derks of the MGA's Sinden Award in 1991. They marked it with a celebration lunch, attended by the Italian MGA's president, local friends and dignitaries. Elmar Sohm and his wife from Austria and MGA Director, Ken James, were among the guests.

Above: Senor Tommaso Sartor, technical manager, with grower Graziano Spinazza and Toni Martignago, compost manager.

Left: "The three musketeers" Bruno Francescutti, Gerard Derks and Enzo Giordani, who were responsible for the development of the compost system, with the Sinden Award scroll at the celebration lunch.

Funghi del Montello

A visit to Italy always gives the opportunity for an interesting grower visit. The development of Funghi del Montello, in all sectors of their business, was a refreshing insight into the confidence which can be shown, even in the most competitive of markets.

Montello is the largest grower in Italy, with a fresh output of 5,000 tonnes and cannery production of 8,000 tonnes per annum. 50% of their own production is sold fresh, half of this to supermarket outlets, with customers in Germany, Switzerland, Austria and Liechtenstein. The top fresh price is around 2,400 lira (£1.10) per kilo. 25% of the crop is mechanically harvested. Not surprising when Dr Bagnosco, their managing director, reports that the wage rate for their lowest paid full-time worker is 16,500 lira (£7.57) per hour. With 150 full-time and 260 part-time workers, mechanical harvesting is a vital element in the economy of the business.

EASTERN AREA MEETING

Wages Board and Worker's Lung

Dennis Driscoll, Personnel Director of Middlebrook Mushrooms, spoke at the Eastern Area meeting about the Agricultural Wages Board Settlement, the MGA Wages Survey and Mushroom Worker's Lung.

Statistics from the Ministry of Agriculture show that the total workforce within the industry is declining; full-time labour down 22.7% in the 1980s while part-timers fell 6.5% over the same period. The number of casual workers increased by 0.9%. Mr Driscoll pointed out that the Ministry probably underestimates the employment of casual or harvest labour as the data is collected annually in June whereas the peak demand for labour will be during the harvest months of July to October. Without doubt, the trend is towards a smaller employed workforce with an increasing proportion of part-time and casual workers. Furthermore, employment costs are a reducing proportion of many farmers' costs.

A sociologist viewing the industry and such data might conclude that the workforce is scattered, inadequately organised and poorly placed to negotiate with well organised and powerful employers. Hence, the need for the safeguard of minimum terms and conditions of employment awarded annually by the Agricultural Wages Board.

From the mushroom producers' viewpoint, reality is somewhat different. Wage costs are increasing as a proportion of total production costs. In 1989 they were 37.5%; in 1990 – 40.7% and now in 1991 – 43%. Employment by mushroom producers has not been casualised nor is there a significant seasonal pattern. A high proportion of employees have long service records, albeit as regular part-time employees. Many employees enjoy the benefits of company pension schemes and other features of relatively secure employment. Increasing labour costs, however, combined with materials price inflation and falling real prices for our products have resulted in the mushroom industry shedding 16% of its workforce in the last three years. In 1990 there were 17 farm closures – that is 8% of the membership of the MGA.

It is probable that the AWB's view of the mushroom industry is imperfect. In order to establish our argument for the mushroom industry being a special case, the MGA must receive completed MGA Wages Survey forms. It is, incidentally, realised by everyone involved that filling in forms is time consuming, and may appear a waste of valuable resources. In this case, however, the growers' response to the Wages Survey will provide ammunition to prevent a Wages Board settlement that could make the mushroom industry financially unviable. Contributions from small, medium and large growers are vital parts of the total picture.

Russell Howes talking to speaker Dennis Driscoll.

Dennis Driscoll then tackled another prickly topic:

Occupational asthma – or allergic alveolitis

This is an acute reaction to exposure to mould spores which are released as compost is tumbled. The problem is caused when spores are inhaled and then settle in the lower lung, unlike farmer's lung when spores affect the upper respiratory tract.

As a worker becomes "sensitised" to mould spores the symptoms he presents are: aching joints, breathlessness, headaches and fever. They usually appear about 12 hours after exposure to the spores, and are not dissimilar to 'flu. Once sensitised the lung produces scar tissue and loses efficiency.

It is not simple to diagnose. Many doctors will mistake it for bronchitis. The most reliable way to establish the presence of "mushroom lung" is for the patient to have his lung capacity measured by peak flow tests. These need to be conducted every four hours throughout 24 hours for two weeks, when a correlation can be made between "reaction" and the type of work being undertaken. Antibodies will interact with the spores when sensitisation has occurred. These may show up in a blood test, but not reliably so. Their presence may help confirm a diagnosis.

As an employer it is your legal responsibility to safeguard your employees' health. Therefore, in order to protect them from potentially dangerous exposure to compost spores, and yourself from prosecution for negligence, you should take the following precautions.

1. Avoid employing anyone who has chest problems or a history of allergic reactions.

2. Be aware of indications from current staff of a reaction to spores. A reaction can occur as long as 20 years after entry to the industry and first exposure to mould spores.

3. Wherever possible, reduce workers' exposure to the spore hazard.

4. Workers in higher risk areas should wear a respirator that filters down to one micron. A simple mask to this specification can be very uncomfortable if worn over several hours. The practical solution is an individual air stream helmet which costs about £170. Make sure that they are supplied and worn.

5. Arrange for workers in higher risk areas to have an annual check-up with a GP. This will cost about £40 per visit.

6. Make sure that an employee does not ignore symptoms which could be the first signs of alveolitis.

If a medical check-up indicates a respiratory problem take further steps including peak flow tests. If the condition is confirmed, move the employee to a lower risk area but continue to provide personal respiratory protection. If the problem persists, seek specialist medical advice and consider an ill health incapability dismissal.

Remember that compensation for loss of work due to a medical condition brought about by working conditions will be settled by employer liability insurance and will typically not exceed £8,000. On the other hand, failure to take the necessary precautions and failure to monitor the hazard can be regarded by the High Court as evidence of negligence and once proved the financial compensation awarded by the court will be significantly higher. A recent occupational asthma case resulted in a settlement of £40,000.

Employers are obliged to report aveolitis to the Health and Safety Executive, in the same way that you would an accident. Should you be the recipient of a claim from an employee take advice from the MGA as your first step.

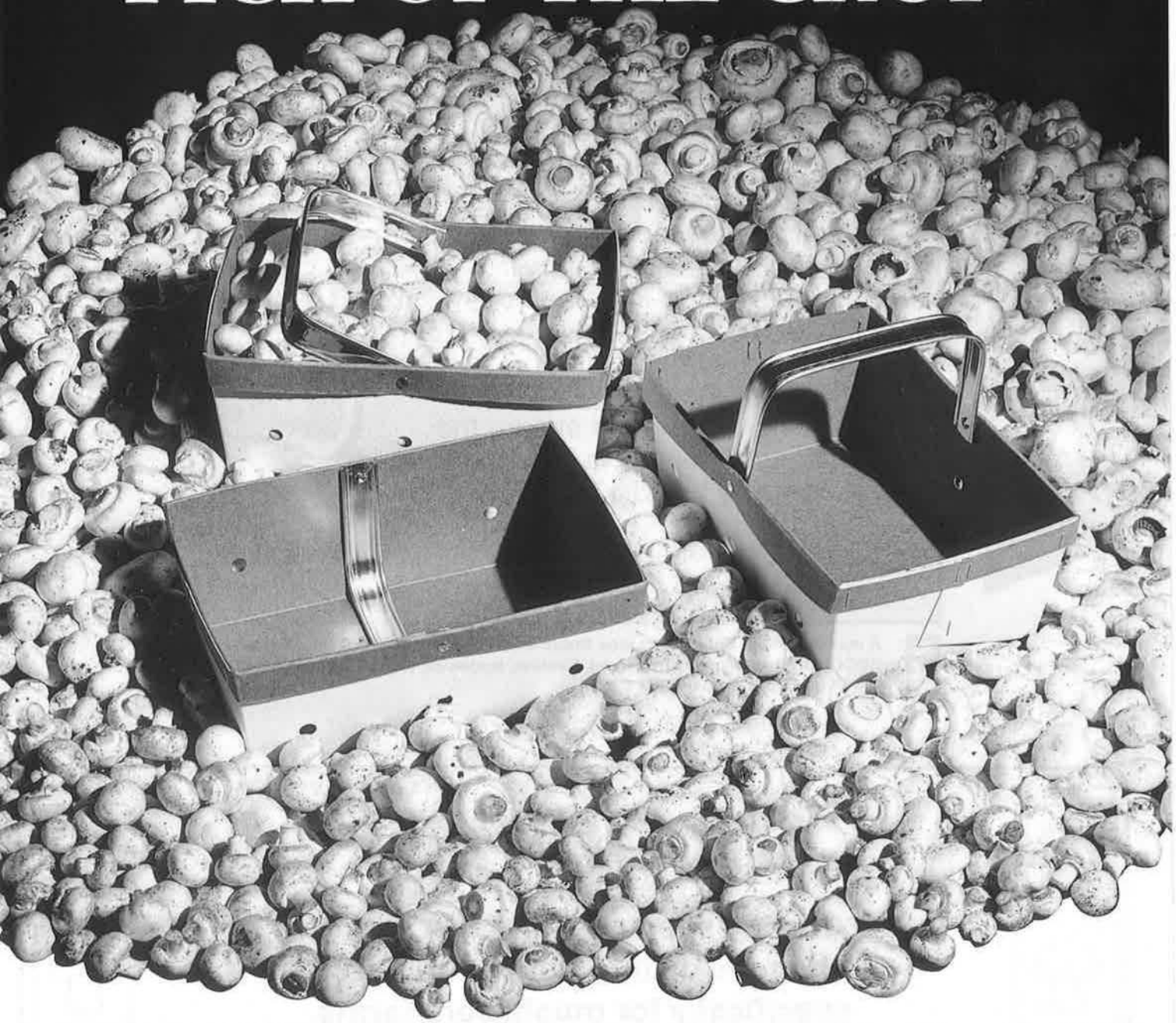
Finally, a reminder to the producers who sell spent compost, the COSHH regulations require you to issue a product data sheet warning transporters and customers of the hazard.

Jean Ellis from Brinsbury College explained that there were benefits not only to mushroom farm workers of completing NVQ "on farm" assessments, but also to growers as the knock-on effect was that their staff would become more enthusiastic about their work and interested in perfecting their skills.

Barney Greenhill – wholesaler from New Covent Garden Market, London – asked us some questions: Where have we come from? Where are we now? and Where are we going?

There have been many fluctuations in supply and demand since the mushroom industry took off in 1945. In 1991 the market is difficult for everybody, but it grieved him to think how much effort growers put into producing mushrooms, and how little effort into negotiating with the wholesaler! There were too many misunderstandings in the industry. The wholesaler wants quality mushrooms too! Let's get together and work for mutual profit.

PICK OF THE CROP



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REMPLOY

The MGA works for you

The MGA works for YOU and will continue to do so in this year ahead. To give you an idea of some of the areas in which we have been working, and what has already been achieved, there follows a brief resumé of the main areas of activity during the past year, excluding area meetings and the monthly Journal.

Significant MGA activities in 1991

January
Help set up a small grower group in Wales.
Launch of mushroom video and distribution organised.
NCVQ Level I available to industry.

February
Participation in NAMC San Antonio, to attract new members and encourage better use of R&D funds via international collaboration. MGA asked to discuss administration role for ISMS.
European M G achieve restriction on semi-processed imports.
Exec advised of consumption problems in EC and need for promotion.
M&E continue work to make Goodman report on health and safety measures acceptable to industry.
Executive agree need for industry quality standards.

March
Director participates in Stirling/Safeway symposium, at which Food Trade Gap exposed. MGA work on this with FFB and government through the year.
AGM at Stratford, with afternoon technical discussions.
C. Spencer and B. Howes retire, Robert Brown elected to Exec.

April
M&P agree to improved handling campaign, initially using mushroom lids.
NCVQ Level II tests accredited.
Open Learning Economics and Bag modules completed.

May
Vegetarian leaflet launched.
Guidelines to reduce smell and noise – drawn up by MGA and consultant – sent to all members.
COSHH recommendations resulting from Goodman report sent to all members.
MGA working party agreed by Executive.
Notes produced for members to approach their MPs.
MGA starts discussions on compost guidelines – re Environmental Protection Act 1990.
Separate mushroom section agreed by SAWB.
Submission to MAFF on wage award, aids to Ireland and EC import policy.
MGA visit Tecnomico, Italy, and Director gives paper.

June
Meeting with EC Commission on vital need for changes in quota/tariff arrangements.
Steering committee agreed for 1995 congress.
Director appointed to FFB Food Trade Gap working party.

July
Poles seek import increase from 35 to 55K tonnes.
Oxford recommended as venue for 1995 Congress.
AWB Questionnaire sent to members.

August
Proposals for EC promotion scheme prepared and discussed with Dutch.
500th issue lunch. Lord Plumb guest speaker.
Special conference and congress issue of Journal.
Case made to MAFF on the aids available to Irish competitors, especially in taxation relief.
Submission for NFU on Food Trade Gap issue.

September
Meet ISMS Council and agree to host 1995 Congress.
Visit ISMS Congress in Dublin. Stand to attract MGA membership. EMG continue to press case for import regulation changes. Safeguard clause on third country imports extended to end of October.
MGA conference in Glasgow a success as a conference, but low grower numbers.
Submission to Commons Agric Committee on Food Trade Gap.

October
Special Executive agrees to seek inclusion of mushrooms in MAFF code of practice for good air quality.
Food Safety & Hygiene, Open Learning module completed.
E&T agree to set up working group to investigate training needs for use of Condair income.
To meet HSE standards, M&E committee agree to publicise annual medical checks for employees in high risk areas.
Safety policy statement for members agreed by M&E.
Ed Board agrees to publish a yearbook in April 1992.
Conference committee recommends new format of two days.

November
MAFF announce funds available for Wellesbourne move.
DoE guidelines on composting odours agreed.
HRI Open Day visit.
Conf committee meeting with MATA agrees co-operation on marketing the conference and attracting new members.
MGA working party start their investigations.
Exec agree that MGA Award scheme to be launched in January.
M&E prepare submission for AWB discussions in 1992, using special questionnaire results.
M&P group meet FFB for discussions on a quality scheme.
MGA has stand at the BBC Good Food Show. Great interest in leaflets and mushroom samples. Over 38,000 attend.

December
M&P agree handling poster and retail handling campaign, using special lid designs.
M&P agree January meeting with Dutch to discuss promotion.
Exec agree make-up of 1995 Congress steering committee.
M&E make presentation of AWB case to NFU.

Through year, many topics, including work on odour cases, planning requests etc.

KIJ

COMMERCIAL CORNER

Compact forklift

Not all tractor-mounted forklifts are compact enough to cope with the restricted access available in many mushroom houses. One that can has recently been introduced by Charterhouse Turf Machinery. Its lowered, two-stage mast measures just 1.6 metres from the ground, low enough to clear most entrances.

Despite its 1-ton loading capacity, it can be operated from tractors as small as 20hp. Charterhouse manage this by incorporating a pair of support wheels which, under load, take the weight which would otherwise need to be counterbalanced by a bigger and heavier tractor.

The price of the hydraulically-powered forklift is £2,253.

Charterhouse Turf Machinery, Weydown Industrial Estate, Weydown Road, Haslemere, Surrey GU27 1DW. Tel: 0428 61222.

THE Mushroom JOURNAL

MARKETPLACE

For just 30p per word you can advertise all your wants and sales in this classified feature. That spare piece of equipment cluttering up your space; those packing cases, pallets, plastic trays... anything you do not want. OR anything you need: that spare part which would enable you to renovate that machine standing idle; any item conceivable which becomes necessary and which you cannot easily obtain locally; OR do you offer a service? Need assistance in some matter...
Whatever the need try a classified in our Marketplace.

PEAT/CHALK/CASING MATERIALS

CROXTON + GARRY offer mushroom chalk from plants at Melton near Hull and Steeple Morden near Royston (Herts). Both BRITOMYA C and SNOWCAL 10 are available in 25 kg bags for use levels of 10 – 25 kg per bale of peat. Enquiries: CROXTON + GARRY LIMITED, Curtis Road, Dorking, Surrey RH4 1XA. Tel: 0306 886688. Telex: 859567/8 C and G. Fax: 0306 887780.

MUSHROOM CHALK SUPPLIED IN BULK OR POLYBAGS (50kg bags). Best quality Lincolnshire Casing Chalk. Enquiries Caistor Limes Ltd, Caistor, Lincolnshire. Tel. (0472) 851281.

It has been decided to accept advertisements for staff in the Journal both for Situations Vacant and Wanted. For details please ring **Lisa on 0780 66888 or Fax 0780 66558.**

SITUATIONS VACANT

PHASE II COMPOSTER requires 'hands on' spawning and despatch manager for block/bulk/bag deliveries. Dedicated individual with highest possible standards essential. Capable of working as part of a small team in modern facility in the South of England. Please apply in first instance to Box 300, MGA, 2 St Paul's Street, Stamford PE9 2BE.

HEATING AND VENTILATION

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.

FARM 2000 STRAW/WOOD BOILER, 350,000 btu. Ideal supplement to existing hot water system. Running costs approx 1/10th of oil. £850. Ellington Mushrooms. Tel. Huntingdon (0480) 810687.

To advertise here just phone **Lisa on 0780 66888** or **Fax 0780 66558** and your message will be seen by everyone in the mushroom industry.

MACHINERY AND EQUIPMENT

YIELDPAK. The simple and cost effective system to monitor crop and picker performance. Bonus and wages module saves time and money. Customisation to individual requirements. Details from PMH Measuring Systems Ltd, 3 Lansdowne Road, Angmering, Sussex, BN16 4JX. Telephone 0903 850016.

TAMPLIN LINE EQUIPMENT. Contact Ken Proud for details on Casing Mixers, Conveyors, Spawn Distributors, Compost Loaders etc., plus spares for existing lines. Tel: 0243 512599. Fax: 0243 511189.

FOR SALE. 5ft x 4ft trays — legs down — ex-Country Kitchen. Also 5½ft x 4ft trays — legs up. **WANTED —** Plastic trays for pre-pack work. Contact R Beardsell. Tel. 07048 72427.

GENERATORS Hire and sale of new and used generators. LCH Generators Ltd. Tel: (0360) 40764. Fax: (0360) 40798.

STEEL RACKING. Approx 15,000 sq ft, 4ft x 4ft, 3 tier high individual units. Ideal for blocks or bags. Moveable by forklift when full. £20/unit. Ellington Mushrooms. Tel. Huntingdon (0480) 810687.

PROPERTY

MODERN MUSHROOM COMPLEX TO RENT

(338 tonnes of compost per annum)
Rent-free up to initial cropping

Comprising seven Fordingbridge mushroom houses of approximately 1100sq ft — six of which are individually heated by Carrier heat pumps and shelved out to each hold approx 13 tonnes of Hensby or Tunnel Tech type blocks. The seventh house has air conditioning and serves as packing/store house. Mobile home on site for rest-room with kitchen, toilets etc. Unit self-contained, immediately available without any Capital premium for a rent of £250 per week — the first 5 non-cropping weeks are rent free!

J & M S Howe, Brookhouse Farm, Highbrook, Ardingly, Sussex.
Telephone: 0444 892127 Fax: 0444 892542

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