



Marshall Agroecology Ltd

Environmental information for agronomists 2002: needs and provision

A report by the
Farmed Environment Company
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For
Crop Protection Association UK Ltd and UKASTA

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Quotes from agronomists

All agronomic advice encompasses some environmental advice

Knowing what agri-environmental schemes are available for farmers to be entered into to enhance farm biodiversity and to regain the income they are losing through IACS modulation

More emphasis on environmental impact of crop protection products when formulating recommendations

Speak to the expert on the subject – it's the only way of getting the message right

Out of season (mid-winter) concentrated training/updating

Adapting farm operations to accommodate environmental initiatives without affecting profitability

Demonstrations of exciting and successful on-farm projects showing obvious environmental benefits

Increased cooperation with environmental bodies

Presently, most farmers are engaged in the daily grind of business survival

The majority of farmers who have survived the crisis in farming are already following ICM and IFM techniques

Practical training with plenty of interaction, leading to a focused understanding of the subject

Who is going to pay for this range of advice?

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Executive summary

Under the Crop Protection industry's and Farming industry's Pesticides Voluntary Initiative aimed at avoiding a pesticide tax, improved environmental training and knowledge transfer will be developed. As part of this initiative, the Crop Protection Association (CPA) and UKASTA have commissioned this report on current skills levels and information and training requirements. Information has been collected from two agronomist discussion groups and a questionnaire sent to all CPA and UKASTA member companies. Informal discussions were also held with individuals representing non-CPA members, researchers and FWAG. A total of 113 questionnaire responses were received and analysed. The objectives are 1) to evaluate the current levels of agri-environmental knowledge amongst agronomists from a number of technical and commercial companies and 2) to outline current and future information, skills and training needs and identify the best means of provision.

Conclusions:

- **The crop protection industry is already influencing environmental management and biodiversity on the ground with agronomists as trusted advisors**
- **The variability of understanding of environmental issues amongst agronomists is a key aspect to be faced**
- **FWAG are the specialists in farm wildlife advice**
- **Existing information vehicles within the industry are well-developed**
- **The results indicate that the CPA should develop an environmental training programme supported by a knowledge resource**

Recommendations:

1. The environmental skills base of agronomists needs to be raised to a uniform basic level. The BASIS scheme may provide a suitable model. A number of organisations such as the Farmed Environment Company and the Farming and Wildlife Advisory Group are specialist providers in this area.
2. Training needs to cover:
the BAP and HAP targets and basic species and habitat identification
basic habitat management
relevant agri-environmental support schemes
codes of good agricultural practice for air, soils and water
farm wildlife audit
and should support pesticide selection, cultural control, ICM and precision farming.
3. The formal training scheme should involve face-to-face training, with a strong field-based demonstration element and access to experts.
4. Training needs to be supported by a knowledge/information resource, as well as relevant and timely reminders to agronomists.
A choice of methods to access the knowledge resource (Internet, CD-ROM, hardcopy) is needed, to satisfy all agronomists' learning styles.
5. A web-based resource is likely to be the most important. Websites such as that under development by FWAG for their own advisers may provide such information or at least a model for it.
6. The knowledge resource should also be supported with hardcopy or electronic information packs for a) advisers and b) farmers. Email can be used to provide this information for many but not all advisers.
7. CPA and UKASTA should consider more formal links with FWAG.

1. Introduction

1.1. The Pesticides Voluntary Initiative

With the publication of the Curry Report on the deliberations of the Policy Commission on Farming and Food on 29 January 2002, there is increased focus on the future of UK agriculture. Even before this report was published, the impacts of foot and mouth disease and BSE had damaged the public perception of farming. With significant public pressure on pesticide use, the government had been considering a pesticide tax. The industry has taken a measured response to this proposal by drawing up a series of plans to improve the environmental awareness of those involved with pesticide use on the ground.

In March 2001, the government accepted the industry's voluntary 24-point action plan, known as the Pesticides Voluntary Initiative, to minimise any adverse environmental impacts of crop protection products. On the basis of the proposals, the government has not imposed a pesticide tax. The Financial Secretary to the Treasury agreed the implementation of the package, the time scales for the different actions and the supervision of the package by a Steering Group, with the then DETR, now DEFRA, as the lead government department. In putting together alternatives to a pesticides tax, the industry has identified three goals:

- to reduce the potential environmental effects of pesticide use
- to improve the biodiversity of arable farmland
- to prevent water contamination by pesticides

To this end, the industry seeks to:

1. Identify those aspects of crop protection that pose the greatest risk to the environment and biodiversity
2. Develop practical and effective techniques to reduce or mitigate those risks
3. Ensure rapid adoption of these techniques on farm through a comprehensive training and technology transfer programme

The action plan comprises 24 points, with a series of individual tasks and projects. These are arranged as three pillars within the overall package:

- A survey of current practice
- Adoption of Crop Protection Management Plans (CPMPs)
- Appointment of the Biodiversity Officer

The Biodiversity Officer has a number of roles, including improving the flow of information between the industry, environmental groups and DEFRA. A specific task is to provide environmental information and resources for agronomists. As key players in providing advice, information and materials on the ground for farmers, agronomists need to understand and have access to practical environmental information. Agronomists, because they directly interact with the farm business, are highly influential in how production land is managed. By the same token, they can therefore influence environmental choices and management options. They need to be able to make the correct choices and provide advice on the basis of sound information and training.

The Farming and Food report (2002) has made several recommendations regarding the use of pesticides:

- that the Government maintains its strategy to reduce the risk from pesticide use, and that efforts to research and disseminate advice on systems and techniques such as Integrated Farm Management and organic farming, that reduce or avoid the need for pesticides, should continue to be a high priority for public research and technology transfer funding.
- that the voluntary industry package of measures on pesticide use is embedded within the baseline 'Red Tractor' assurance scheme. Meanwhile, the case for a pesticides tax should be kept under continuous review, as at present. Ongoing attention should be given to the development of policy measures in other EU Member States, to ensure that the Voluntary Initiative is in line with standards elsewhere in Europe, as far as is appropriate in England's situation.

These recommendations serve to illustrate the on-going pressures on the farming and crop protection industry.

1.2. Environmental aspects of crop protection and agronomy advice

Concerns regarding biological diversity were the focus of the Convention on the Conservation of Biological Diversity signed by most of the world's governments at Rio in 1992. As a signatory, the UK government is committed to the preservation of diversity, including species and genetic diversity. It has prepared an overall Action Plan, made up of a series of Biodiversity Action Plans (BAP) for individual species and Habitat Action Plans (HAP) (Anon, 1994, 1995a, b) (<http://www.ukbap.org.uk/>).

The reasons for the conservation of biodiversity are moral, aesthetic, social and economic. We steward other organisms for their intrinsic value and because species may be of benefit to human society and have economic value. A culture that encourages respect for wildlife is preferable to one that does not. Biodiversity can be easily lost but is difficult to regain, particularly if species are driven to extinction. Biodiversity, including genetic diversity, may provide economic benefits. Even at the level of landscape, biodiversity may influence tourism and sense of place. Perhaps of greatest concern is that biodiversity has a role in the function of ecosystems (Tilman et al., 1996). Erosion of diversity may thus ultimately result in damage to ecosystem function.

An emerging paradigm is the conservation of species and communities within the farmed landscape as a whole (Mineau & McLaughlin, 1996). In the UK for example, there are almost no true wilderness areas and more than 75% of the land surface is farmed in one way or another. With such fragmentation of natural habitats and predominance of agriculture, there is a need to develop practical means of maintaining diversity in the wider landscape. A series of research initiatives addressing field margin management, whole-farm planning, integrated farm management, integrated crop protection, water protection and precision agriculture are now becoming part of conventional practice or are finding support within agri-environmental schemes.

Aspects of pollution from farming operations have become the focus of legislation and codes of good agricultural practice for the protection of soils, water and air over the past twenty years. There are a number of areas that are of direct concern to agronomists. These are fertiliser and pesticide movement to surface and ground waters and non-target effects of crop protection products. In the past, focus on pollution prevention was largely on point source events, such as slurry overflows or spray tank cleaning. These remain a concern, particularly the storage and disposal of pesticides on hard standing areas. However, diffuse pollution from drift, leaching through soils and overland water and sediment movement are becoming of greater importance following improved compliance with point source regulations. LERAPs requirements and interest in buffer strips reflect this concern.

With greater interest in diffuse pollution, the impacts of farming systems on soil erosion and sedimentation in rivers and streams has become one focus of the Environment Agency. The wider growth of maize crops in southern and western Britain is implicated in increased sedimentation in some catchments with trout and salmon rivers.

Finally, non-target effects of crop protection products are under examination, partly for regulatory requirements under EU Directives, but also because a number of changes in the fauna and flora of farmland have become apparent over recent years. For example, a range of previously common farmland birds have shown marked declines in both population size and geographical ranges (Fuller et al., 1995). The long term decline in populations of the grey partridge are caused by three factors: reduced nesting habitat, increased predation (lack of keeping) and reduced chick survival caused by reduced insect availability in cereal crops (Aebischer, 1991; Potts, 1986; Potts & Aebischer, 1995). The reduced numbers of insect chick food items is a result of improved control of broadleaved weeds with herbicides, aggravated by a move to winter arable cropping. The likely non-target effects of herbicides have been reviewed recently (Marshall, 2001; Marshall et al., 2001). With increasing knowledge of the ecological interactions within farmland, there is a need for integration with agronomy and crop protection advice to achieve the best balance for multifunctional agriculture.

1.3. Report aims

In order to help implement the Pesticides Voluntary Initiative, the CPA and UKASTA have commissioned the present study of the environmental information and training needs of agronomists. The aims of this study were to examine:

- What environmental information is currently provided
- What may be needed in the future
- What levels of environmental skills and knowledge are present in the industry
- How current skills and information are developed
- What new training may be required
- How might environmental information be best provided

Objectives of the report:

To evaluate the current levels of agri-environmental knowledge amongst agronomists from a number of technical and commercial companies

To outline current and future information, skills and training needs and identify the best means of provision

2. Methods

Focus groups:

Two focus groups were held with the aim of gaining first hand information from agronomists on their involvement with environmental aspects of their work and how they best receive information and skills training. The first meeting was at IACR – Long Ashton Research Station on 13 December 2001, attended by three agronomists from different companies and the new CPA Biodiversity Officer. A second focus group was held on 8 January 2002 at the CPA offices in Peterborough, attended by 13 agronomists from six different companies. The groups considered five different questions, but opinions were also sought regarding the wider state of the industry and the success or otherwise of groups influencing policy.

The five questions posed were:

- What environmental information do you currently provide?
- What environmental information do you think agronomists, crop consultants and distributors are likely to need to provide in future?
- How do you currently get information you use in your job?
- If the CPA or UKASTA put together new information and training material, how would you like to receive it?
- What other organisations do you or would you use, to provide your customers with environmental information?

Questionnaire:

To augment the results of the focus groups, a short questionnaire (Appendix 4) was sent to CPA and UKASTA agronomists at the end of November 2001 to gauge a) knowledge levels, b) information needs and c) best methods of dissemination of environmental information and skills. The questionnaire was developed in consultation with Patrick Goldsworthy at the CPA and circulated by email and hardcopy to member companies. The questionnaire was also mounted on the Web at: <http://www.agroecol.co.uk/CPAquest.htm>. An initial response deadline of 24 December 2001 was extended to 14 January 2002, so that more than 100 responses could be considered. Results of the questionnaire have been summarised using simple spreadsheets with graphical representations where appropriate.

Collation and review of information:

The results of the focus groups and questionnaire were collated and their implications discussed. In reviewing the questionnaire results and following contacts with FWAG, RDS officers and scientists in several research organisations regarding environmental information, a range of topic areas that should be covered in training have been proposed. A range of existing training and information sources that may be used by CPA and UKASTA are also briefly summarised. Finally recommendations on information and training needs have been made.

[Note: CPA and UKASTA as joint-sponsors are used interchangeably in this report]

3. Results of Focus group discussions

Two agronomist discussion groups were held, the first at IACR-Long Ashton Research Station with attendees from the three companies, as well as CPA. A second was held with representatives of six companies. The objectives of the meetings were to explore the perceptions and needs for environmental information as part of modern agronomy advice (Programme see Appendix 2). The groups considered five different questions, but opinions were also sought regarding the wider state of the industry and the success or otherwise of groups influencing policy.

Responses to the five questions posed are presented as a series of remarks and observations from each meeting, divided into methods of environmental information provision, information that agronomists provide and should provide in future and the state of the industry.

3.1. Methods of information provision

- Agronomists are key players, as trusted advisers on the farm. They can take more of a lead on environmental affairs.
- There is no substitute for formal training.
- A baseline of skills and knowledge is needed for the industry. BASIS is well-recognised and professionally accepted and could provide a vehicle for such training.
- Industry needs to be seen to be open. A formal training programme and Continuing Professional Development would demonstrate this and could give positive publicity for farming and the industry.
- A CPA website could be useful, with appropriate links to other information sources.
- Many companies provide in-house centrally updated web-based crop protection product databases. Information provision by individual companies using the Internet is fast, with automatic download, giving comprehensive reference information on laptops. Increasing use of PDAs linked to PCs/mobiles allows rapid business transactions, ordering etc.
- Information sources need to be backed up by hardcopy or Email. Sending information monthly, internally within companies, via Email or the net, would be useful, especially if linked to coincide with actions in the field, product timings etc. (Note that regional variations occur and can render such information valueless)
- While probably 90% of agronomists have access to the Internet, probably only 40-50% use email. Agronomists should be asked how they would like to receive information. A variety of information provision is needed.
- The organisations that are used by agronomists for specialist conservation advice include FWAG, Game Conservancy Trust, DEFRA-RDS and RSPB.
- A CPA briefing pack for agronomists, containing facts and figures, would be a great help in getting the messages on responsible practice across (even in the pub).
- Do not re-invent the wheel. Much information is available, if not in the right format.
- Too much paper is around already. Preferably no paper, or only “collectible” A4 sheets.
- Highlight environmental information from manufacturers, e.g. LERAP requirements and data from product Environmental Information Sheets.
- Links to machinery manufacturers could be useful.

- Financial incentives and grant information is important, especially where these are competitive, e.g. Countryside Stewardship.

3.2. Information that should be provided

- Most agronomists are using ICM as the model for their work.
- In implementing IACS and other schemes, there is a general perception that mixed interpretations are coming from government agencies, with staff having mixed levels of agronomic skills.
- A Countryside Stewardship proposal can take 75 hours to prepare. Payment levels are not commensurate with agronomist's time rates, i.e. they cannot charge the correct rate.
- Agronomists advice is either included in the cost of products or annual service charge per hectare, but they already provide more than chemicals in the form of advice and information. If environmental matters become important and a part of the agronomists responsibilities, how does he/she charge? Will environment become part of the job description?
- There is some potential conflict with FWAG, though with suitable credit, agronomists and FWAG can work together.
- There are too many agri-environmental schemes. A single scheme with one format would help both farmers and advisers [the Curry Report proposes a wider, simpler scheme than CSS and ESAs].
- Environmental information is often lacking or contradictory: what weeds should we leave, how many? Many farmers require clean crops – the tidy approach. Under the Assured Crops Scheme, most yards are clean with little spilt grain. This may be contributing to the decline in sparrow populations.
- Environmental information needed:
 - financial information for agri-environmental schemes
 - field margin management
 - weeds: which and where can be left
 - clear reasons for actions/changes to management
 - BAP species and HAPs
 - basic habitat identification
- Mindsets may need changing, especially if work is customer-driven. There is some complacency on-farm.
- LERAPs – statutory, but over-complicated; managed by buffer zone.
- In providing information to farmers and growers, there is an overriding need to identify what is in it for the customer, particularly as farm economics are so tight.
- In servicing clients, there are differences between owner-occupiers and people who are renting land.
- There is a danger of information overload – there are too many acronyms in use.
- Ecological information is often specialised to one species or taxa, with no regard to how the farm system functions, with sometimes conflicting requirements.
- Information needs to be filtered, simple and consistent.
- Information provide on the farm is site-specific. The advisor needs to be able to tailor the advice to the site.

3.3. State of the industry

- Need for a full audit of the benefits and status of farmland, to provide a baseline against which future changes in farming can be judged. Many farmers and growers already do good works, much of which goes unrecognised. There is misunderstanding of the countryside by the general public.
- Environmental audits could be included with IACS.
- The Crop Protection Management Plans will aim to be in action on 30% of farms and will address biodiversity, water pollution and agrochemical usage, probably using LEAF and EMA data.
- Major threats to the environment in the South West are associated with huge increases in power of machinery and threats to soil structure and erosion.
- Access by the public can bring problems: litter in high-value crops, disturbance to wildlife.
- Supermarkets are major drivers of farm businesses.
- Traceability of food is important.
- Advisors are in the business of managing risk for farmers and growers. Whilst some risk is tolerable in some crops/situations, there are others where insurance treatment is essential, e.g. blight control.
- Pesticide use is usually **pre-emptive** rather than prophylactic.

3.4. Implications of the agronomist discussion groups

A number of recurring themes were aired at both discussion meetings that are reflected in the notes under each of the topic headings. It was also apparent that there were a variety of views regarding environmental concerns, reflecting different levels of knowledge, experience and use. Some contributors are well-advanced with regard to providing environmental advice, e.g. LERAPs, while others are less so. There is wide concern over the future of the industry, what information is needed and how this will fit into the role of the agronomist. All attendees reported the importance of the agronomist as a trusted adviser. Whilst environmental information is diverse and sometimes contradictory, there is general agreement on its importance, which fits well with the development of integrated farm management. The maintenance of farm incomes alongside compliance with codes of practice and legislation is a recurring theme. There was general appreciation of past problems and of newer threats, for example to soil structure.

The role of CPA and success in projecting a positive and open image for the industry was a topic for discussion, often contrasted with the impact of single-issue pressure groups in the media. Emotional arguments generally score over factual ones and “good news” stories are less often taken up, than those that present bad or contentious news. Education of agronomists, farmers and the general public is needed. The need for some form of farm audit was discussed (also recommended by the Curry Report) as a means of providing a baseline against which future change can be measured.

In terms of providing information to agronomists, there were two aspects that were raised. First, the agronomist needs training and good access to information. Secondly, the agronomist needs access to material to pass on as part of his advice for farmers. The depth of information for these two levels of **knowledge transfer** is different. Formal training of

agronomists is key for the first level, backed up by information sources. A basic level of environmental training across the industry would be positive, perhaps linked to BASIS qualification. Enhanced competency skills could be developed beyond the basic level. Most people favoured web-based information, as many already use databases on crop protection materials. However, a strong recommendation was that there be flexibility of information provision, so that individual agronomists have access as they wish. Email and targeted hardcopy sent to match the timing of field operations or time deadlines would be useful. Suitable hardcopy for farmers is also required.

In summary:

1. Skills levels are diverse amongst agronomists – a standard level is needed, perhaps provided as BASIS-style training. This can give positive messages to the media.
2. Environmental information that needs to be provided includes:
 - financial and management information for agri-environmental schemes
 - basic species and habitat identification (BAP & HAP)
 - field margin management
 - weeds: which and where can be left
 - clear reasons for actions/changes to management
3. A baseline audit for the environmental state of the farming is required, against which future change can be judged.
4. The industry needs to take a proactive role with the media to present an open, outward-facing and informative picture to the general public. Perhaps the adverse effects of crop diseases and pests on our food might be a theme to develop.
5. Training and information provision can be best provided by a mix of learning media – no single method suits all, depending on individual learning styles (reflectors, pragmatists, theorists or activists)
6. Methods that were highlighted were formal training, backed up by information availability on the Web and as targeted hardcopy. Emails are used by perhaps 40% of agronomists and are a useful tool.
7. Information packages that agronomists can use to pass on to farmers are also needed.

4. Responses to questionnaires on environmental affairs

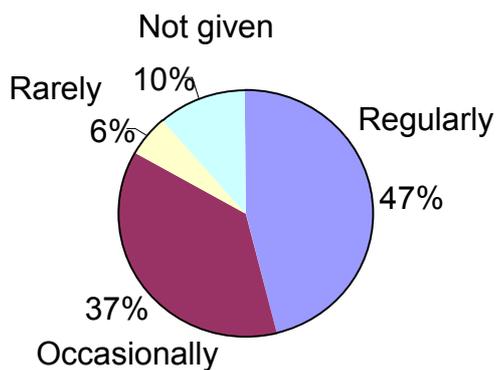
4.1. Questionnaire coverage

A total of 113 responses were received from agronomists and technical managers, representing at least 15 companies and groups. Responses were received from England, Wales and Scotland. All respondents worked as agronomists, at least part of their time. The respondents included one trainee, 16 managers and directors with the majority as field agronomists.

Over 89% of respondents (101/113) reported they provided some form of environmental advice to their clients. This was shared equally between regular and occasional provision. Most advice was unprompted, but more than 30% was provided as company policy (Fig. 4.1.).

A)

Frequency of environmental advice given



B)

Policy on giving environmental advice

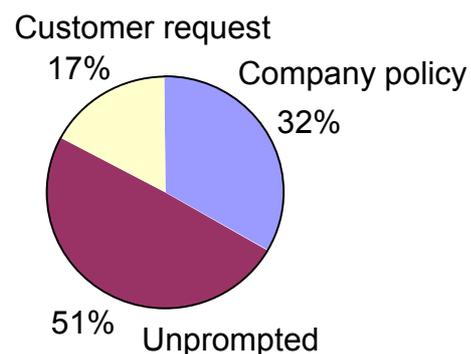


Fig. 4.1. A) Frequency of environmental advice and B) basis of provision of advice.

4.2. What types of environmental advice do you provide?

Environmental advice that is being provided by the industry covers a wide range of subjects (Table 4.1), with the majority associated with product selection, pollution minimisation and compliance with LERAP, as might be expected. Nevertheless, the advice provided by some agronomists covers field margin, hedgerow and set-aside management and agri-environmental schemes.

Table 4.1. Types of environmental advice provided by agronomists.

Topic area	No. responses
LERAP	52
Product selection	37
Field margins	26
Countryside Stewardship/ agri-environment schemes	24
Water protection	16
Fertiliser/manures	15
ICM	12
Pollution minimisation	10
Pesticide/waste disposal	9
Hedgerow management	8
Set-aside	8
Following crops/rotation	6
Other – conservation headlands, soils, storage, etc.	29

4.3. Environmental skills

As a simple assessment of the environmental skills base of the respondents, a series of acronyms were presented for identification (Table 4.2, Fig. 4.2). A number of these were almost invariably correctly identified, whilst others were less commonly recognised. On average, 5.7 of the 9 acronyms were correctly identified (63%).

Table 4.2. Acronyms and the proportion correctly identified.

Acronym		% correct (No.)
HAP	Habitat Action Plan	15% (17)
ESA	Environmentally Sensitive Area	93% (105)
LERAP	Local Environmental Risk Assessment for Pesticides	89% (101)
BAP	Biodiversity Action Plan	24% (27)
PSD	Pesticides Safety Directorate	88% (100)
DEFRA	Department for Environment, Food and Rural Affairs	73% (82)
SAFFIE	Sustainable Arable Farming For an Improved Environment	8% (9)
FWAG	Farming and Wildlife Advisory Group	87% (98)
RSPB	Royal Society for the Protection of Birds	96% (109)

Numbers of correct acronyms

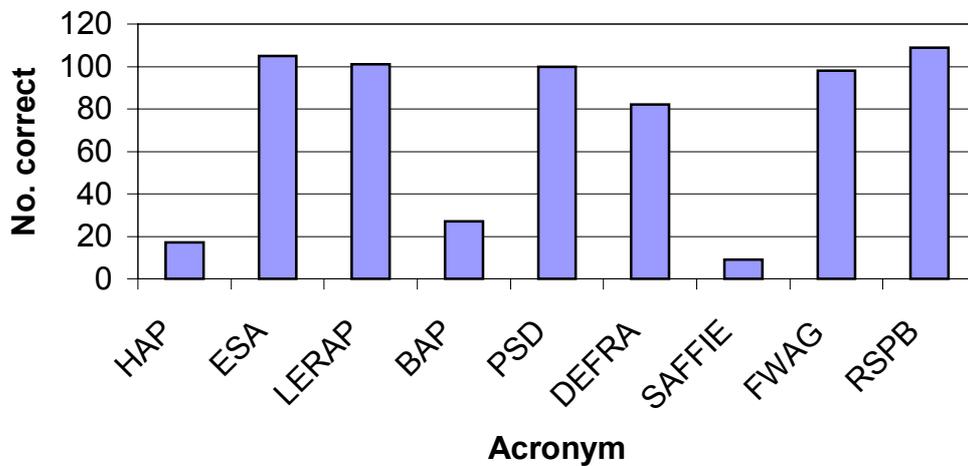


Fig. 4.2. The numbers of acronyms correctly identified.

Acronyms associated with crop protection, LERAP and PSD were well-recognised. Older environmental acronyms (ESA - 1987, FWAG - 1983 and RSPB - 1889) were also usually correctly identified, but newer ones (BAP, HAP - 1995) were poorly identified. The high success of RSPB perhaps reflects the success of the campaigning and publicity side of that organisation. The new ministry that replaces MAFF, DEFRA, was also not as often correctly named as might have been expected. As observed by one respondent, agronomists could be forgiven for expecting the name to include “Farming”, rather than “Food”. The new SAPPION LINK research project SAFFIE, which has only recently begun, was correctly named by nine respondents. This project has yet to receive wide publicity, so a low response rate is to be expected.

4.4. What do you know about environmental schemes and their requirements?

When asked to rate their own knowledge of different environmental topics, respondents showed variable levels of understanding of agri-environmental schemes, but high levels on pollution prevention, particularly LERAPs. The mean score for LERAPs was 4.5, with the highest minimum score of 3. This illustrates that the industry is responsive and has taken on the administration of a new pollution protection measure rapidly. LERAPs were introduced in 1999.

Table 4.3. Personal knowledge/skill ratings (out of 5: 1= I don't know much; 5 = I know full details and can put into practice)

Topic	Mean score	Range (0-5)
Countryside Stewardship	2.63	1 – 4
Tir Gofal*	*1.50	1 – 5
Arable Stewardship	2.09	1 – 5
ESA	2.43	1 – 5
SSSI	2.12	1 – 4
Water protection	3.33	1 – 5
Conservation headlands	3.16	1 – 5
LERAP	4.49	3 – 5
Hedgerow management	2.68	1 – 5

*An underestimate, as some non-Welsh data is included.

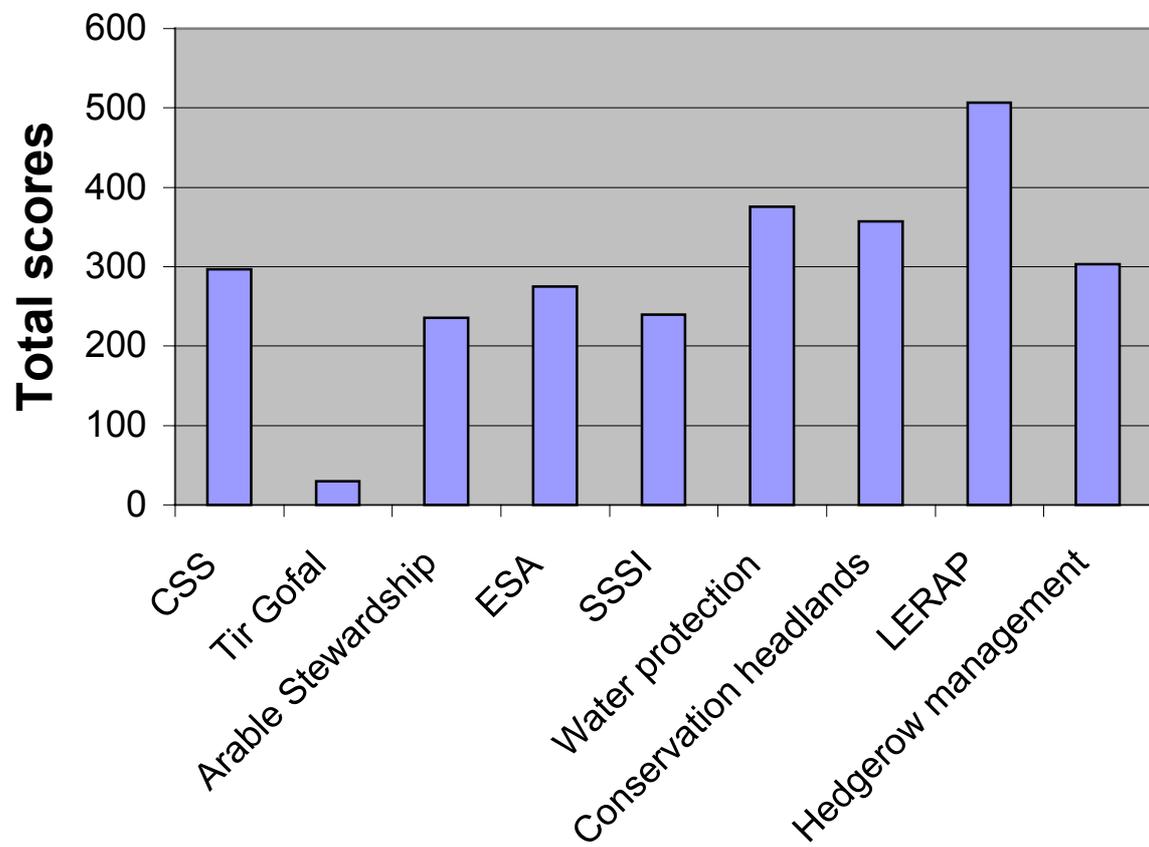


Fig. 4.3. Score totals (each out of 5 per respondent) representing familiarity with implementing different aspects of environmental protection and biodiversity on the farm.

4.5. Who would you refer farmers to for further specialist environmental information?

Most agronomists listed environmental organisations to which they would refer clients for specialist advice (Table 4.4). The Farming & Wildlife Advisory Group (FWAG) is the pre-eminent specialist, though a total of 27 organisations were listed. As FWAG have a county-based organisation with at least one advisor in each, this is perhaps not unexpected.

Clearly, every agronomist has different concerns that they feel responsible for and there are differences in the Welsh, Scottish and English organisations that are appropriate. Of interest, the statutory wildlife agencies, English Nature, Scottish Natural Heritage and the Countryside Council for Wales, are hardly used by agronomists. This may reflect the perception that these organisations may concentrate on designating nature reserves and thus limiting the options of landowners.

Table 4.4. Environmental organisations that agronomists refer to for specialist advice.

Environmental organisation	Number of responses
FWAG	79
DEFRA/FRCA/Rural Development Service	54
LEAF	20
Environment Agency/Water Authorities	17
RSPB	16
Game Conservancy Trust	12
Internal Technical Department	8
Local Govt/Welsh Assembly	5
ADAS	5
CPA	4
Private Consultancies	4
English Nature	4
Local Wildlife Trust	3
Scottish Agricultural College	3
Other – Forest Enterprise, CLA, SNH, etc.	19

4.6. What areas of environmental information do you think agronomists need to provide?

When asked what information agronomists should be providing, there was general agreement that appropriate crop protection and crop husbandry information was required (Fig. 4.4). Lower positive responses were recorded for habitat management and direct conservation. A number of other areas were identified, including information on the financial implications of environmental approaches, soil protection and the requirement for the industry to appear transparent in its actions. A frequent comment was that agronomists are unable to charge for environmental work at economic rates.

No. positive responses

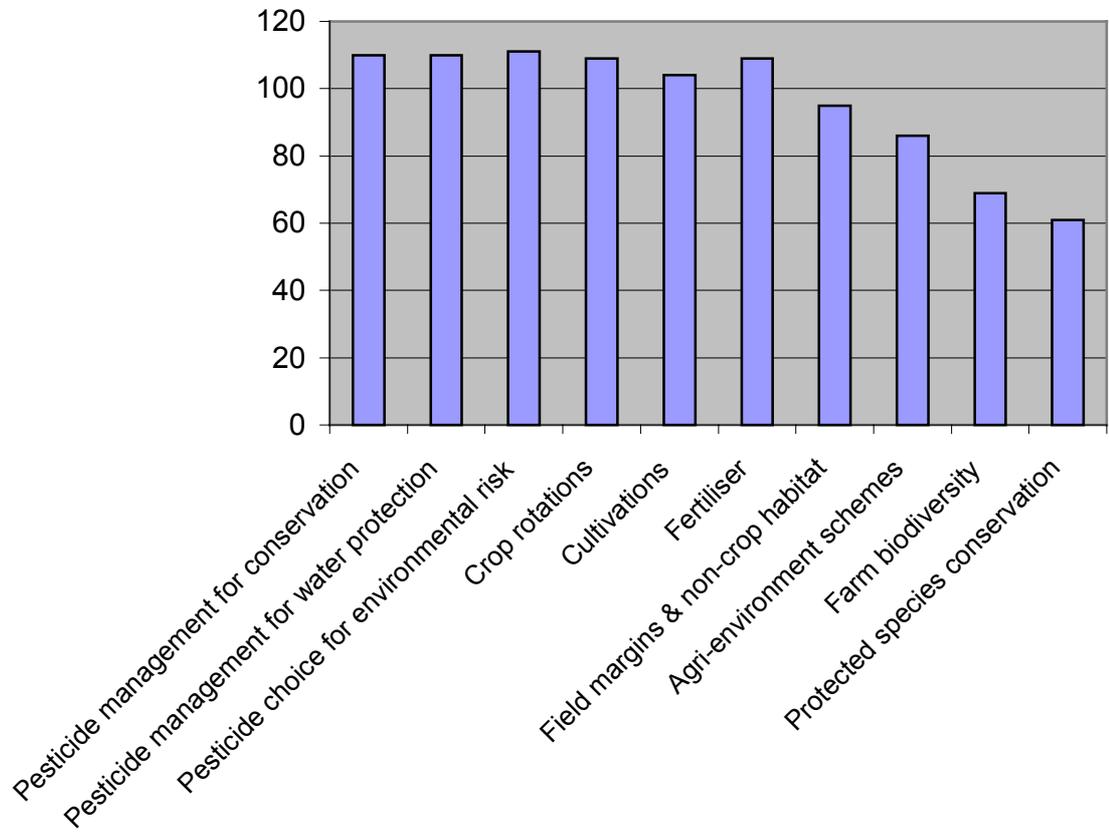


Fig. 4.4. Should agronomists provide advice on these topics? Numbers of positive responses

4.7. What do you consider are the areas of environmental advice that will become important in future?

Respondents were asked to suggest the areas of environmental information that will become important in the industry. A wide variety of topics were identified as likely to become important. These are worthy of examination, as they give some insights into current concerns for the future (Table 4.5). Information on environmental support schemes is a common requirement, which is closely aligned with income retention for farmers and growers. Clearly, many agronomists are conscious that all means of maintaining farm profitability need to be explored. Continuing scrutiny of pollution is regarded as important, with water protection identified as likely to be a future requirement for the industry. Aspects of non-crop habitat management are also regarded as important topic areas. A range of other topics were identified by one or two respondents, covering developments in GM technology, public access, product traceability and central record keeping for the industry.

Table 4.5. What do you consider are the areas of environmental advice that will become important in future?

Topic	No. responses	Topic	No. responses
Agri-environment schemes	40	Good Agricultural Practice	3
Water quality/protection	27	Right to roam/access by the public	4
Income retention/area payment changes	19	New measures/regulations	3
Farm biodiversity	15	Pesticide disposal	3
Headland strips/field margins	15	Whole-farm appraisal	3
Pesticide use	14	“End buyer” demand/quality	2
Integrated Farm Management/ICM	12	Alternative crops	2
Habitat management	10	Crop rotations	2
Hedgerow management	7	Food	2
Pollution prevention	7	General environmental	2
Soils/erosion	7	GM crops	2
Fertiliser/nutrient management	6	What the media push	2
Watercourses	5	Other – central record keeping, groundwater, sustainability etc	15
Set-aside	4		

4.8. How do you keep up with developments in the industry?

The methods that agronomists use to gain information are varied, but with a small number of popular ones (Table 4.6). High response rates for formal training and company literature indicate that the industry is well-organised for information dissemination. Research Open Days and Shows score fairly highly, indicating that these are regarded as useful. The Internet is obviously used by a significant number of agronomists (c. 40%). Academic journals and scientific conferences are used by a small but significant number of people (c. 24%). Company literature is important to agronomists. This includes information provided by manufacturers, but also information provided in-house by individual companies by their own technical groups.

Table 4.6. How do you keep up with developments in the industry?

Methods	No. responses
Agricultural press	104
Formal training	100
Company literature	90
Research Open Days	61
Internet	43
Shows	33
Scientific conferences	31
Academic journals	25
Books	23
CD ROM	17
Radio	9
Word of mouth	2
Trial sites	2
Other – E-mail, experts, FWAG, RSPB etc.	7

4.9. How should new information and training material be provided?

Respondents were asked how they would prefer to receive new information and training material, what other methods apart from those suggested would be used and finally, which two methods did they regard as most effective.

Clearly, formal training is the most popular means of information delivery, with support from CD-ROM, hardcopy and a website (Table 4.7). A variety of other information transfer methods were mentioned, with on-farm demonstration forming a significant number of these. Interaction with experts and relevant environmental organisations were also mentioned by several respondents.

Table 4.7. Methods of information gathering that would be used by agronomists.

Method	No. responses
<i>Training days</i>	94
<i>CD ROM</i>	43
<i>Looseleaf binder</i>	42
<i>Leaflets</i>	31
<i>Website</i>	30
<i>Books</i>	10
<i>Email</i>	9
Other suggested methods	
<i>Demonstrations/Open days</i>	11
<i>Cooperation with environmental organisations (FWAG, GCT)</i>	9
<i>On-farm</i>	8
<i>Company team meetings</i>	7
<i>Interaction with experts</i>	7
<i>Discussion groups</i>	5
<i>Internet/webcam</i>	4
<i>Farmer meetings</i>	4
<i>Research organisations</i>	3
<i>Farmer leaflets</i>	2
<i>Agricultural press</i>	2
<i>Manufacturer meetings</i>	2
<i>Email/topical tips</i>	2
<i>Other – video, pressure groups</i>	8

When asked to identify the two most effective information transfer methods, a subtly different picture emerges (Table 4.8). Formal training is the most important element, but electronic information via email and the Internet is regarded as important. Hardcopy and CD-ROM are important, but to a lesser extent. Individual learning styles of agronomists need to be assessed and taken into account.

Table 4.8. Which methods of information transfer are most effective?

Method	No. responses
Formal training days	58
Email	52
Hard copy	20
Leaflets	15
CD ROM	14
Website/Internet	12
Group discussions	9
Practical demonstrations	9
Expert 1-to-1	7
Company literature/email	6
Interactive training course	5
Agricultural press	4
Open Days	4
FAX/phone	2
TV	2
Conferences	1

4.10. Implications of the questionnaire results

Whilst the questionnaire had over 100 respondents, it is nevertheless only a sample of the 2000+ agronomists in the industry. There were respondents from England, Wales and Scotland, giving good coverage, but the majority of respondents were from England. This may give a bias to the arable and horticultural sector, but this should reflect where most crop protection products are used. An element of bias in terms of type of respondent might also be possible. However, the diversity of environmental skills levels illustrated by the responses and the range of companies represented, indicates the sample may be regarded as giving a useful reflection of agronomist skills and attitudes.

Skills base and current advice given

The questionnaire provides some insights into the skills base and the concerns of agronomists in the industry with regard to environmental and biodiversity issues. It is clear that there is a good level of understanding of LERAPs and therefore the environmental consequences of crop protection product pollution of surface waters. There is some appreciation of the agri-environment schemes, but this is variable. The range of environmental issues covered by individual agronomists is striking. These range from pond and habitat management, through fertiliser and FYM use, product selection, storage and use to ICM and whole farm plans. Therefore, **the industry is already influencing environmental management and biodiversity on the ground**. Nevertheless, whilst some respondents have a good understanding of environmental issues on the ground and what is developing, others have a rather poor grasp of biodiversity and conservation issues, as illustrated by some questionnaire responses.

The variability of understanding environmental issues amongst agronomists is a key aspect to be faced.

Environmental information that agronomists need

The key areas of environmental information that agronomists require information on are:

- a) agri-environmental support schemes, including means of retaining income on farms and forthcoming changes to area support
- b) water protection
- c) integrated farm management, including pesticide use
- d) farm biodiversity, including habitat management, notably headlands and field margins.

This will require training in Action Plan target species and habitats, identification, habitat management, details of agri-environmental support schemes, codes of good agricultural practice and farm environmental audits.

Provision of specialist advice

Most agronomists have a good idea of the specialist organisations they can refer customers to. The Farming & Wildlife Advisory Group is pre-eminent in this position. **The CPA and UKASTA should consider formal links with the organisation.**

Current methods of gaining information

The agricultural press, formal training and company literature are the most widely used training and information vehicles in the industry. **This reflects the importance of information flow in the advisory business and the existing strengths there.** Research

Open Days, shows and the Internet play some role, with primary research journals and scientific conferences used by about 20% of agronomists.

Provision of new environmental information

Agronomists favour formal face-to-face training for new training and information, supported by Email. Access to an information resource using CD-ROMs, hardcopy and the Internet would support this primary training. **The results indicate that the CPA and UKASTA should consider a training programme supported by a knowledge resource.**

5. Existing information, training and support

There are a number of information sources that will be of use in the development of training and information resources for the CPA. The development of environmental training for agronomists is already well-advanced in some quarters. For example, the Farmed Environment Company (FEC) is developing a specialist training programme for agronomists. This has included presentations to members of the Association of Independent Crop Consultants (AICC). Whilst their role is primarily to advise farmers and land-owner, FWAG have a wealth of relevant experience and are in the process of formally recording that information on the web (see on).

A number of training initiatives are in progress at present, at various levels. At the national level, the University for Industry (Ufi) (<http://www.ufilttd.co.uk/>) is developing the web-based LearnDirect initiative for the government (<http://www.learnirect.co.uk/>). This learning for life project already lists some 500,000 courses available across the UK, mostly taught though some available on-line. LANTRA National Training Organisation is the land-based & environmental sector "hub" for this project (<http://www.lantra.co.uk/>). The LANTRA Professional Register is recognised by DEFRA, and is used as the benchmark standard by which all tutors or instructors and Training Providers are measured when submitting bids under the ERDP Vocational Training Scheme (VTS) project. A number of relevant training companies and registered trainers are listed in Appendix 5.

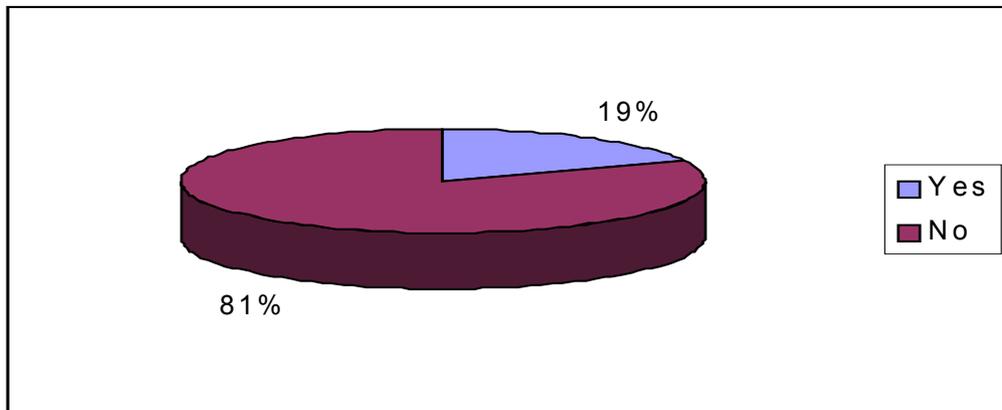
Lantra NTO offer an Affiliation option for access to their Professional Register. It is open to organisations already operating a recognised quality assured register of training and / or business support practitioners. Affiliated companies need to show that their members needs are regularly updated and assessed, and a formal CPD scheme needs to be in operation, such as the BASIS scheme.

Whilst little is available at present in regard to suitable on-line courses, there are moves afoot to develop this within LANTRA. An on-line NVQ level in amenity management is being run by the Warren Farm Centre, Horton-cum-Studley, Oxfordshire, which might form a model.

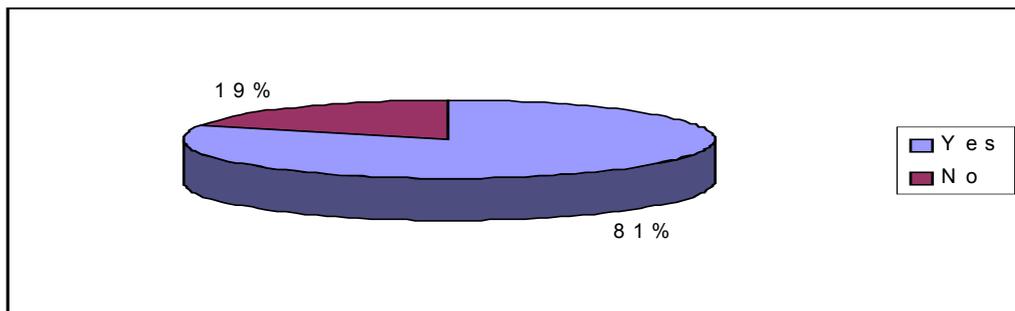
Of interest, UAP/FEC conducted a survey of 120 farmers in the winter of 1999/2000, covering a representative cross-section of farm type, size and geographical location. Responses to questions regarding training can be compared with results of the present report on requirements for agronomists. The UAP data illustrate that farmers themselves would attend suitable courses, particularly if run by trained agronomists. This reflects the important and trusted position of agronomists.

Extracts from UAP (2000) report:

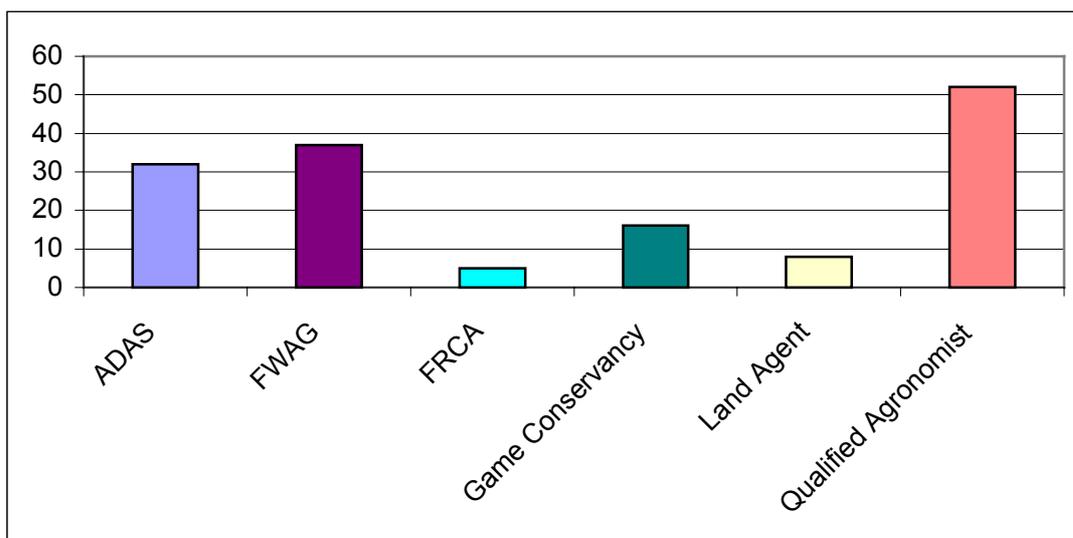
17. Have you attended any environmental training courses?



18. If courses were available that linked Profitable Farming and Practical Conservation would you see them as valuable and attend them?



19. Agri-environmental training would best be done by? (more than one can be ticked):



End of extract

Of course, existing training establishments increasingly include environmental aspects as key parts of agronomy training. So, new staff joining the industry should have a reasonable grounding in ecology, pollution control etc. For both existing and new staff, basic but detailed technical training will still be required. As well as provision by FEC, FWAG or others, specialist topics might be covered by LANTRA trainers, educational and research establishments, e.g. Morley Research, and others, for example Sustainable Farm Plan training from Caroline Corsie (info@sustainablefarming.co.uk)

Web-based information sources

A comprehensive data source for farming and wildlife is under development on the FWAG website <http://www.fwag.org.uk/>

This will cover aspects of farmland biodiversity and will interpret relevant research results as part of the Research Vision area of the site. Simple messages are supported by pages with further information and links to the primary research literature. It would be possible to use this sort of site as the CPA information resource, in collaboration, so long as the ancillary hardcopy and email was also specifically produced and targeted for agronomists.

Other organisations are developing web-based information, including research organisations such as IACR and the Game Conservancy Trust (<http://www.gct.org.uk/>).

Specific information on UK biodiversity action plans is located at:

<http://www.ukbap.org.uk/>.

Financial support for training

The question regarding financial support for training will need consideration at some stage. Individuals in England who have a farm Holding Number may be eligible for vocational training support under the England Rural Development Plan (ERDP). Thus farmers may be able to get support for training. However, most agronomists would not be eligible.

Nevertheless, SMEs, in particular training companies, may be able to apply for support from the European Social Fund. Otherwise, the industry will need to bear these costs.

6. Recommendations

1. The environmental skills base of agronomists needs to be raised to a uniform basic level. The BASIS scheme may provide a suitable model. A number of organisations such as the Farmed Environment Company are specialist providers in this area.
2. Training needs to cover:
 - Biodiversity: concepts and principles
 - the BAP and HAP targets
 - basic species and habitat identification
 - basic habitat management
 - relevant agri-environmental support schemes
 - codes of good agricultural practice for air, soils and water
 - farm wildlife audit
 - Training should also support pesticide selection, cultural control, ICM and precision farming. Crop Protection Management Plans
3. The formal training scheme should involve face-to-face training, with a strong field-based demonstration element and access to experts.
4. Training needs to be supported by a knowledge/information resource, as well as relevant and timely reminders to agronomists.
A choice of methods to access the knowledge resource (Internet, CD-ROM, hardcopy) is needed, to satisfy all agronomists' learning styles.
5. A web-based resource is likely to be the most important. Websites such as that under development by FWAG for their own advisers may provide such information or at least a model for it.
6. The knowledge resource should also be supported with hardcopy or electronic information packs for a) advisers and b) farmers. Email can be used to provide this information for many but not all advisers.
7. CPA and UKASTA should consider formal links with FWAG.

Acknowledgements

I am most grateful to the 113 agronomists who spent time completing the questionnaire. I am also particularly grateful to those who attended the agronomist discussion meetings at Long Ashton and Peterborough. These meetings allowed a much better insight into information support techniques used in the industry and gave sound views on what may be of most use with regard to knowledge transfer. Useful discussions have been held with many people, including staff of FWAG. I am indebted to staff of the Farmed Environment Company for their help in setting up the focus groups and for their input to the report, particularly Richard Brown, Diane Lister, Marek Nowakowski and Alasdair Lowe. Finally, I much appreciate the help of Patrick Goldsworthy and June Edney at the Crop Protection Association.

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Appendix 1.

Project specification

Specification outline:

A report will be submitted to the Crop Protection Association by 14 January 2002 comprising a review of the needs for environmental information for agronomists and recommendations on the means of providing that information, covering current competency levels and future skills required to provide agri-environmental advice on the farm.

Objectives:

To evaluate the current levels of agri-environmental knowledge amongst agronomists from a number of technical and commercial companies

To evaluate the future information needs for sound agri-environmental advice

To outline current and future information, skills and training needs and the means of provision

Project Plan:

1. Focus groups: We propose to hold two focus groups at Manor Farm during the week beginning 10 December at which a range of agronomists and managers will discuss in round-table style their perceived needs for agri-environmental information and training and how that might best be provided.
2. Questionnaire: A short questionnaire will be sent to CPA and UKASTA agronomist members for rapid responses to identify a) knowledge levels, b) information needs and c) best methods of dissemination.
3. Telephone interviews of a range of agri-environmental stakeholders, such as FWAG, RDS, RSPB, will ascertain the information areas that they regard as important in advancing agri-environmental management on the ground.
4. Collation and review of information. Draft recommendations on information and training needs. The results will be collated into a report to the CPA, with an initial draft discussed within the Farmed Environment Company.

EJPM
5/11/01

Appendix 2.

Focus group programme

Objective: to canvas opinions on what environmental and ICM information is currently provided by the industry, what will need to be provided in the future, and to identify the most useful means of providing that information.

10.30 Coffee

11.00 Welcome and outline

11.05 Directions in agriculture

11.15 What information in ICM, environmental protection, Stewardship and biodiversity is currently provided? – discussion

Crop protection - pesticide selection

Rotation

Cultivation

Fertiliser

Field margins

LERAP

Countryside Stewardship

ESAs

BAPs and HAPS

Farm biodiversity

12.15 What areas of information and advice on ICM and the environment will the industry need to provide in future?

What environmental constraints, threats and opportunities might the industry be facing in the short to medium term – e.g. EU law, climate change etc.?

13.00 Lunch

13.45 Summary of morning discussions and agreed information needs

14.00 How can information be most easily, efficiently and successfully be provided? – discussion on information experiences.

What interactions are there/ might there be with other organisations, including RDS, FWAG, RSPB, EN etc.? Who are they?

- Training methods for different topics

- Training materials for different topics

leaflets

reports and books

CD ROM

Website, etc.

15.15 Summing-up

15.30 Tea and depart

Appendix 3.

Attendees at Agronomist discussion groups

Thursday 13 December 2001 – LARS

Philip Laughton, Technicrop

Tim Wittaker, Banks Cargill

John Auton, UAP

June Edney, CPA

Jon Marshall

8 January 2002 – CPA, Peterborough

Moderator: Jon Marshall, Marshall Agroecology Ltd

Reuben Morris, Cropwise Ltd

Jane Cambidge, Cropwise Ltd.

Andrew Pennill, Cropwise Ltd

Dennis Brooksby, Masstock Arable

Bob Bulmer, Dalgety

Bob Mills, Banks Cargill

Jon Yeoman, Banks Cargill

Andy Roy, Banks Cargill

Joe McNicholl, Procam Group

Richard Rawlings, Procam Group

Nick Meyers, Procam Group

Martyn Christopher, UAP

My sincere thanks to all those that took part in the discussion meetings. The views expressed were particularly useful in formulating the recommendations. Whilst the opinions in this report are mine, I hope that they reflect a consensus of all those who contributed.

Appendix 4.

Crop Protection Association/UKASTA environment questionnaire

– in conjunction with the Farmed Environment Company

Objective

Environmental affairs have always been important but are becoming more and more prominent in agriculture, horticulture and amenity sectors. The CPA is seeking agronomist and distributor views on the needs for environmental information and training particularly for the agricultural sector and the most appropriate means of successfully meeting those needs. Your help in assessing those needs and in indicating how you prefer to receive information that helps you to do your job would be greatly appreciated. If you can spend a few minutes completing this short questionnaire, your answers will help the CPA provide the information you need on conservation, sustainability, ICM and environmental protection in the form you want. If you can also ask your colleagues to respond to this request, that would be appreciated. Copies of the questionnaire can be printed off the Internet at:

<http://www.agroecol.co.uk/CPAquest.htm>

Company	
Position	
Responsibilities	

1. Do you provide environmental advice? Yes/No

2a. If yes, what types of environmental advice do you provide?

--

2b. How often do you give this advice? (tick one answer only)

Regularly Occasionally Rarely

2c. Do you give this advice? (tick as appropriate)

As part of company policy Unprompted Only when requested by the customer

3. What do the following letters stand for?

HAP	
ESA	
LERAP	
BAP	
PSD	
DEFRA	
SAFFIE	
FWAG	
RSPB	

4. What do you know about the following? **Please rate from 1 to 5:** 1= I don't know much;
5 = I know full details and can put into practice.

Item	Score
Countryside Stewardship (CS)	
Tir Gofal (Wales only)	
Arable Stewardship additions to CS	
My local Environmentally Sensitive Area(s)	
SSSI designation	
Water Protection	
Conservation Headlands	
LERAPs	
Hedgerow Management	

5. Who do you/would you refer farmers to, for further specialist environmental information?
Please list all organisations.

--

6. What areas of environmental information do you think agronomists needs to provide?

	Yes/No	Comment
Pesticide management for conservation		
Pesticide management for water quality protection		
Pesticide choice for environmental risks		
Crop rotations		
Cultivations		
Fertiliser		
Field margins & non-crop habitat management		
Agri-environmental schemes		
Farm biodiversity		
Protected species conservation		
Other areas – please expand		

7. What do you consider are the areas of environmental advice that will be become important in future?

--

8. How do you keep up with developments in the industry? (**Tick the five** that you use most) Add any others.

Agricultural press	Company literature	Internet	CD ROMs	Shows	Formal training	Scientific conferences
Academic journals	Books	Audio tapes	Radio	Research Open days	Other (specify)	

9. If new information and training material on environmental matters were to be provided, how would you prefer to receive it?

Leaflets	Books	Looseleaf sheets and binder	Training days	CD ROM
Website	Other (specify)			

10. What other methods would you use for information gathering and training?

--

11. Which two methods of information transfer do you regard as most effective and important?

VOLUNTARY INFORMATION:

If you would be happy to be contacted regarding your responses, please provide your name and contact details:

Name	Telephone	Email

Many thanks.

Please return by 24 December 2001 to:

Dr Jon Marshall, Marshall Agroecology Ltd, 2 Nut Tree Cottages, Barton, Winscombe, Somerset, BS25 1DU or Fax to 01934 844844

Appendix 5.

LANTRA registered environmental training companies and instructors.

Company	Location	Contact
Achieve-ability Plus	Gloucestershire	Achieveability Plus
Business Works	Ayrshire	Rob Cockburn
COG Training	Perthshire	Jacqueline Sands
East Lincolnshire Rural Training	Lincolnshire	Kay Mowbray
Harborough Training Group	Leicestershire	Aline Dawn Marriott
Fakenham and Dereham Training Group	Norfolk	Elizabeth Roberta Jean Thomas
Trent Valley Training	Nottinghamshire	Patricia Hurt
Lynher Training	Cornwall	Allen M Howell
Mearns and Angus Services Ltd	Aberdeenshire	Graham Bruce
Three Peaks & Skipton Training Group	North Yorkshire	Hazel Dawn Smith
Wyvern Training Services	Herefordshire	Marlene Flaxman
Trainer	Location	Company
David Bacon	Essex	Essex Forest Services
Rob Cockburn	Ayrshire	Business Works
Derek Crawley	Staffordshire	Rodbaston College
David Fletcher	Bedfordshire	
Robert A Grove	Midlothian	
Graham Clark	Perthshire	Highland Off Road
Samuel Tompkins	Cornwall	Mr S Tompkins

Glossary

AICC	Association of Independent Crop Consultants
BAP	Biodiversity Action Plan
CPA	Crop Protection Association
CPMP	Crop protection management plan
DEFRA	Department for the Environment, Food and Rural Affairs
DETR	Department of the Environment, Transport and the Regions
ERDP	England Rural Development Programme
ESA	Environmentally Sensitive Area
FEC	Farmed Environment Company
FRCA	(See RDS) Farming & Rural Conservation Agency
FWAG	Farming & Wildlife Advisory Group
FYM	Farmyard manure
HAP	Habitat Action Plan
IACR	Institute of Arable Crops Research
LANTRA	LANTRA National Training Organisation for land-based industries
LERAP	Local Environmental Risk Assessment for Pesticides
PDA	Personal Digital Assistant
PSD	Pesticides Safety Directorate
RDS	Rural Development Service
RSPB	Royal Society for the Protection of Birds
SAPPIO	Sustainable Arable Production through Precision Input Optimisation
SME	Small and Medium-sized Enterprise
UAP	United Agri Products
UKASTA	UK Agricultural Supply Trade Association