

STEWARDSHIP IN THE AGROCHEMICAL INDUSTRY

Bernhard Johnen, Louise Foster and Mike Thomas from Zeneca Agrochemicals describe the concept and guiding principles

History

The term 'product stewardship' was probably first coined by the Dow Chemical Company to describe their efforts to educate customers and promote safe handling and disposal of its product, which by the 1970's had become integral in their business. The slow pace of the wider adoption of the concept changed considerably as a consequence of the disaster at Union Carbide's Bhopal pesticide plant. During the 1980's public concern grew about the use of pesticides, in particular in the developing world, where often an adequate system of pesticide registration and control was lacking. Despite the UN Food and Agriculture Organisation's efforts to promote such registration and control by fostering international harmonisation of pesticide registration, there was little improvement in practice. This led, in 1982, to the recommendation to develop the FAO International Code of Conduct on the Distribution and Use of Pesticides, which should consider the responsibilities of all people involved in the safe and effective use of pesticides. The research-based agrochemicals industry through its representative body, GIFAP (now GCPF), was fully involved in the formulation of the Code and, with their special expertise, made numerous valuable contributions over the 3 years of preparing the final Code. Following the adoption of the Code in 1985, GIFAP fully endorsed the Code and its ensuing responsibilities. The adherence to the FAO Code became a condition of membership in GIFAP.

The Code provided further impetus to the industry's ongoing efforts to raise standards of pesticide use and to adopt the concept of stewardship. The industry represented by GIFAP underlined its commitment to the Code by helping their members to implement the Code. It immediately produced guidance on the implementation of the Code combined with checklists on the responsibility of all sectors of the industry. The production and distribution during the late 1980's of a series of guideline booklets on the safe use, handling, transport and disposal of crop protection products complemented GIFAP's support for the Code.

In 1997 GCPF republished the "Implementing the FAO International Code of Conduct on Distribution and Use of Pesticides—A Guide for the Crop Protection Industry" to further promote the notion of industry complying with the spirit as well as the letter of the Code. The Code itself and the industry's implementation guide are by-and-large the basis for the stewardship guidelines of individual companies.

The concept of stewardship

The word 'stewardship' or 'product stewardship' is used in a

variety of ways with sometimes substantially differing meaning. In the crop protection industry the scope of stewardship is usually very wide and it is defined as the "responsible and ethical management of all activities, from innovation to ultimate use of products and beyond". The concept, consequently, extends to all stages of the life-cycle of a product, from R&D through manufacture/formulation, distribution, marketing/sales to use and disposal, and its associated activities.

Stewardship is a philosophy, which comes to life by being integral to all we are doing. It is, so to speak, a way of life, and not something that a "stewardship specialist" carries out on behalf of the organisation.

Some ethical guiding principles

Everybody has a responsibility to people and the world as long as they are part of it. From this overarching guiding stewardship principle, the answers to some simple questions can become ethical guiding principles for the agrochemical industry.

Q1. "What are we here for?" We are here to invent, develop, manufacture and sell crop protection products and services. Therefore, it is our first ethical responsibility to make sure that this happens. *Thus our first principle is that we do our jobs properly.* This means, we turn up and deliver what we are paid to deliver to as high a standard as possible.

Q2. "Why do growers buy our products or services?" To protect their crops from pests so that they can have higher yields of better quality produce. Therefore our second ethical responsibility is to make sure that what we promise will happen, actually happens. In other words, *the second principle is about the efficacy of our products.* This means that we do not exploit or take advantage of our customers.

Q3. "What do agrochemicals do?" They kill weeds, fungi or insects. In other words they are all designed to poison something, but may also poison people, animals and the environment through a number of different routes and for a number of different reasons. *The third stewardship principle is about the safety of our products to the end-user and to the environment.*

Q4. "Should we keep the rules?" All our rules come either from legislation or the wish to be seen to be following "best practice". Stewardship is not just about keeping to the rules, but how the rules are kept. The ethical responsibilities in this area are basic and absolute. They are about the 'spirit'

of the law being observed rather than the 'letter'. Otherwise it is quite possible to keep to the law, but be completely immoral. The fourth ethical responsibility is really to ourselves rather than to other people. That means that instead of just keeping the law, we *want* to keep it the best way possible, and similarly we *want* to develop and follow best practice for ourselves, and not just because of what others will think. Therefore the *fourth stewardship principle is about how we keep the rules and influence others to comply with the rules.*

Q5. "Where does our ethical responsibility begin and end in the company or business?" It is probably not helpful to answer the problem in those terms, because it always degenerates into 'opinion'. There is no absolute authority who tells others what is right and everyone else follows on meekly. If one is to construct an ethical system such as 'Stewardship' for a company, everyone gets to speak and everyone gets to listen. One constructs it together or it never gets constructed. So "what are the boundaries?" Where our moral responsibility for a particular action exists, then that is within our boundary of stewardship. *The last stewardship principle is about priorities within our responsibility to everyone and everything.*

Approach to stewardship

The concept requires a change of approach in manufacturing activities well beyond considerations for the traditional areas of employee health and safety and impact on the immediate environment. It extends, amongst other things, to issues such as labelling, packaging and transport. For example, choice of appropriate formulation and packaging, including robust and lasting labels are as critical to the safe and effective use of the products as education and training at distributor, retailer, adviser and farmer level; these latter activities are usually more readily associated with stewardship in crop protection than the former.

The concept of stewardship, therefore, requires a proactive rather than reactive approach. It is about managing all activities properly, rather than about correcting mistakes (which, of course, needs also to be done, if the proactive approach has broken down). The proactive

approach helps both customer and company. The customer receives the goods as required and the company benefits from not having the expense of taking corrective action. In other words the concept has internal (company) and external (customer) focus.

In this context, it is also important to recognise that stewardship applies to publicity and public affairs. As much as the stewardship principles apply to technical literature and advertising activities, they also are relevant in the context of public debate on crop protection products. Good stewardship makes it imperative, that scare-mongering ('circle of poison', 'chemical time bomb', 'Frankenstein food') is vigorously rebutted; that unjustified and plainly false accusations are requested to be withdrawn and corrected; that the benefits are portrayed in an appropriate form; and so on.

Stewardship integrated into the business – the example of Zeneca

Stewardship as defined above provides a formalised approach within Zeneca where staff continuously question their own actions and activities. Whilst the products of the crop protection industry are regulated by governments, many of the day-to-day decision making processes are not. It is here that the questioning culture encouraged by an ethical stewardship approach is essential for society to gain the benefits of crop protection products without the encumbrance of associated risks (see Panels for exemplification of questions related to product development and sale).

The concept of stewardship as described and operated by Zeneca more and more widely in all parts and corners of the business is, as already indicated, an integral business activity. It is not an add-on or peripheral or a short-term fashion. Stewardship is a responsibility of all staff:

- It encompasses a "cradle-to-grave" philosophy.
- Business conduct, ethics and day-to-day activities must be beyond reproach.
- All staff have an obligation to ensure that company's activities derive maximum benefit for society with the least risk to human health, wildlife and the environment.

Typical Selection Procedures Prior To The Sale Of A New Crop Protection Product

- What is the risk profile of the product in each situation in which it is to be used?
- Does the product require more or less safety procedures than existing control methods?
- Can the farming community easily adapt to the new product?
- What pack size is appropriate to the farmers needs?
- Can it be distributed and stored without increasing human/environmental risk?
- What information is needed to accompany the product?
- What training and education is needed to accompany it?
- What waste disposal issues arise from the proposed use?
- Does the product meet the known needs of the customer?
- Will the product bring increased benefit to the customer and consumer?
- Does the use of this product bring positive benefits to society?

Typical Selection Parameters For A New Replacement Crop Protection Product Include:

- Is it safer than existing products?
- Can it be formulated and used safely under current farming practice?
- Is it environmentally safer than existing products?
- Can it provide better effect than existing control methods?
- Is it target specific?
- What effect does it have on other flora/fauna?
- Will it fit into sustainable integrated pest management use patterns?
- Does it increase crop quantity or quality?
- Is it economically viable?
- Does it meet perceived farming needs?
- In total, does it provide significant benefits over existing control methods?

- The questioning culture already mentioned must be developed, nurtured and maintained, because, ultimately every individual in the organisation is responsible for maintaining the company's social acceptability and, consequently, "licence to operate".
- Truly effective stewardship depends on leadership. Therefore stewardship principles form an integral part of job remits and individual staff objectives.
- If stewardship is to work, it is critical that measurements and formal control mechanisms are established and that there is a full commitment to these at the highest level in the organisation. Auditing provides these mechanisms. It helps to assess the state of compliance with stewardship principles at a given time, in a given place and part of the organisation and provides the basis for corrective action, where appropriate. But more importantly, it provides the information required to develop plans for improvements and prioritise the resources and allocate them to areas of most need. Stewardship is what is called "beyond compliance". There is therefore a learning process required, that even in regions or countries with (perceived) stringent legislation, the stewardship standards may call for more effort. Auditing to common standards provides a basis for this learning.

Stewardship activities

It goes without saying that compliance with legislation is a fundamental principle of stewardship, despite the fact that legislation and regulations concerning crop protection products can, at times, be counterproductive to good stewardship. There are many examples for stewardship in action along the chain from invention/discovery to final product use and beyond. Painting a complete picture would go well beyond the scope of this article. More detail can be found in the literature (Thomas, 1999; Johnen and Wilks, 1997).

Research and Development is the starting point for good crop protection stewardship. Performance criteria for the selection of new crop protection products have become more rigorous as the stewardship needs increase. Manageable environmental impact need to be matched with giving effective pest control effectively and sustainably within the principles of Integrated Crop and Integrated Pest Management.

Product formulation is another area where the rapid development is, *inter alia*, driven by the need to improve stewardship of products throughout their life cycle. Modern technology provides opportunities to further reduce the risks not only to the user, but also to those handling crop protection products during manufacture, storage and transport.

Improved packaging design contributes to minimising the handling of crop protection products. It facilitates triple rinsing, a key stewardship process for handling and disposal of empty packs, and thus reduces disposal hazards and environmental disposal problems.

Distribution, storage and transport of crop protection products has undergone considerable stewardship change in recent years. Many independent distribution companies and dealers, who sell Zeneca products use Zeneca stewardship standards and thus ensure that safeguards for people and the

environment are built into the whole logistical process. They also have become providers of valuable information and advice to the farming community, which include safe and effective use as well as other valuable stewardship messages to reinforce the recommendations carried by the product label.

Farmers and farming communities are the final link in the chain to good crop protection stewardship. The traditional support from industry staff, distributors and government advisors is now being enhanced by advice from the food processing and marketing industry. The circle of stewardship of crop protection product use continues to widen. The 'Safe Use Project' of the Global Crop Protection Federation and Zeneca's 'Farmer Education and Training' work being just two examples. The purpose of these projects is to provide farmers, their families and anyone involved with crop protection products with the latest education, training and information to minimise risk and maximise benefits from crop protection products used under the concept of 'good agricultural practice' and sustainable agriculture.

Operator monitoring studies and health surveys in the context of stewardship are concerned with studying the use of crop protection products as it happens in practice, assessing its potential consequences and, where necessary, deriving improved use recommendations and precautionary measures. Also, the suitability and practicability of recommendations concerning protective clothing can be assessed as well as, specifically, establishing the effectiveness of materials used for protection in reducing exposure to and absorption of crop protection products.

Environmental monitoring is a form of post-registration surveillance designed to confirm the crop protection product registration decision, which is largely dependent on the prediction of pre-registration studies. A 'classic' study in this category is the quite unique and large raw-water monitoring study carried out in 1985/86 in Germany under the auspices of the German Crop Protection Association (Anon, 1987). At that time the EU Drinking Water Directive was being implemented. However, virtually no reliable data on crop protection product contamination in raw-water (used for producing drinking water) was available. The German crop protection industry decided that good stewardship for its products required such data to be generated. The conclusion of the study did not signal the end of the industry's concern for contamination of water with its products. On the contrary, it gave the impetus for individual companies in Germany and elsewhere in Europe to set up stewardship programmes in conjunction with farmers, their advisers and the drinking water producers geared towards avoiding ground and raw-water contamination with crop protection chemicals and/or reducing and eliminating contamination where this had already occurred.

Conclusion

The concept of stewardship has taken a fundamental hold in the crop protection industry and, as a consequence, stewardship is not an empty promise. It is at the heart of businesses, because not only does it constitute responsible and ethical management, it also makes good business sense. Good stewardship reduces cost and liabilities. It is not

difficult to see that it supports the creation of new markets and helps to maintain current markets. It is therefore a vital ingredient and integral part of the business for crop protection companies with longer-term interest in the business.

With science racing ahead, stewardship is also providing essential controls on scientific developments to keep the appropriate balance of benefits and risks. Biotechnology is creating new opportunities for developments in agriculture, particularly with respect to gene technology in seed, plant and pest control development. Zeneca is a leader in the field of applying stewardship principles and monitoring to ensure that all discoveries and inventions remain under strict control until such time that information is complete. Commercial and release development of such discoveries will only occur when scientific evidence shows clearly and unambiguously that risk profiles are acceptable and will not impact adversely on the natural environment.

It is highly likely that the next agricultural revolution will make events of the past seem like a non-event. The sustainable way forward is to have stewardship programmes in place to ensure that the scientific developments of today and tomorrow will be managed to the benefits of all in responsible and ethical ways.

References

Thomas, M. R. (1999) Preparing for the next agricultural revolution. In: 'World Development: Aid and foreign direct investment 1999/2000'. ed. A. J. Fairclough, Kensington Publications Limited, London, 101-102.

Johnen, B. G., Wilks, M. F. (1997) Stewardship of crop protection products - the empty promise". *Proceedings of the Brighton Crop Protection Conference—Weeds*, 1075-1084, BCPC, Farnham.

Anon. (1987) Pflanzenschutzwirkstoffe und Trinkwasser - Ergebnisse einer Untersuchungsreihe der Pflanzenschutzmittelindustrie. Industrieverband Agrar (formerly Industrieverband Pflanzenschutz), Frankfurt.

Louise Foster's career spanned from teaching to church ministry. As industrial chaplain to a Zeneca production site she became interested in stewardship and business ethics. She joined Zeneca on a 3-year research contract to work on business ethics. Her research included the practical conversion of this into the day-to-day activities of national selling companies and, in particular, their stewardship efforts. She now works as an independent consultant.

Mike Thomas has been with ICI's and Zeneca's crop protection business for about 35 years. Following his early work in the technical arena he became involved with marketing and sales, primarily, in Africa and the Mediterranean. In the early 1980's he took a lead in developing stewardship in this Region and eventually on a wider company basis. As Senior Stewardship Adviser to Zeneca Mike has also made a major contribution to Stewardship and Safe Use in Africa under the GCPF umbrella. He has recently retired from Zeneca.

Bernhard Johnen's career in ICI/Zeneca started in 1974 in ecological research. He spent more than a decade as manager of regulatory affairs and environmental sciences, briefly interrupted with a spell in herbicide development. In 1991, he set up the "Stewardship Department" in Zeneca bringing together various stewardship-related activities and aiming at making 'stewardship' really integral to the business. He manages the stewardship function to this date.