

CLEARFIELD™ Stewardship – The BASF Commitment to Ensuring Sustainability, Efficacy and Agronomic Benefit

As the developers of some of the most widely used, herbicide-tolerant production systems in the country, BASF Canada has a lead role to play in promoting proper stewardship of this technology to help ensure long-term sustainability, efficacy and agronomic benefit to users of these systems. This is not a responsibility BASF takes lightly – we employ multiple tools to promote, communicate and support our stewardship initiatives for the CLEARFIELD® Production System for growers.

Each CLEARFIELD Production System provides an innovative, unique solution to growers in Western Canada and, in many cases, growers have worked directly with BASF to bring this technology to market. These systems – comprising an imidazolinone herbicide and a crop specifically developed to be tolerant to that herbicide – enable growers to get more out of their farming operation by delivering custom designed weed control solutions and strong agronomic varieties. The BASF CLEARFIELD Production System covers multiple crops and herbicides, offering growers flexibility and choice in terms of how they employ the technology in their farming operation.

The CLEARFIELD Commitment

A critical tool in our stewardship of CLEARFIELD technology is the CLEARFIELD® Commitment™, which is designed to provide additional quality assurance and sustainability of the production system. The CLEARFIELD Commitment involves a no fee user agreement that the grower of a CLEARFIELD crop signs at the time of seed invoicing. This agreement is between the grower and BASF. This commitment outlines the grower's obligations regarding some of the best management practices associated with stewardship of the production system. BASF supports the CLEARFIELD Commitment in the marketplace with incentives for both the grower and the retail outlets that administer the agreement. This has not only proved an effective means of communicating and implementing stewardship practices, but has also created advocacy that supports the plan and aids in its adoption. Currently, there are CLEARFIELD Commitments for both CLEARFIELD canola and CLEARFIELD wheat. BASF plans to utilize the CLEARFIELD Commitment with each CLEARFIELD crop commercialized.

BASF enjoys very high grower compliance with the terms of the CLEARFIELD Commitment, as evidenced through our CLEARFIELD Commitment audits, which are conducted regularly to ensure growers are employing proper practices and complying with CLEARFIELD guidelines.

MAPP

Another tool BASF employs to encourage proper stewardship of our CLEARFIELD Production System and other pesticide offerings is MAPP (Managing Agronomics and Product Priorities), an electronic planning tool that is now in its second phase. Developed for the exclusive use of

BASF Business Representatives, MAPP provides the reps with stewardship guidelines for all CLEARFIELD and other BASF herbicides. This information is geographically specific, as it is customized to the Business Representative's territory, allowing them to understand the market share and usage of various herbicide groups within their territories. The Business Representatives are then able to make better-informed cropping and herbicide-application recommendations to those growers using BASF products and technologies.

An Integrated Approach

Clearly, stewardship of any herbicide-tolerant crop must not only address proper usage of the seed and herbicide components themselves, but also speak to:

- Resistance management using an integrated approach;
- Control of herbicide-tolerant crop volunteers; and
- Managing out-crossing to non-CLEARFIELD crops and weeds.

As such, BASF has developed a set of guiding principles to specifically deal with these issues. These principles include the following specific recommendations:

- Not exceeding a maximum of two exclusive Group 2 herbicides on any one field in any four-year period;
- Always following an Integrated Weed Management (IWM) program that includes herbicides, cultural practices and crop rotations in order to manage weed populations and minimize weed seed development;
- Always controlling volunteers in the season following a CLEARFIELD crop; and
- Using practices that minimize the likelihood of out-crossing to similar crops or related weeds.

We have also developed a detailed Best Management Practices program for the CLEARFIELD Production System, which includes specific agronomic, herbicide, crop rotation and cultural practice considerations and recommendations for each CLEARFIELD crop. Examples of these recommendations for each issue mentioned above include:

Herbicide-Resistant Weeds: using certified seed; employing proper seeding techniques, including space and depth of seeding; herbicide group rotation, using approved tank-mixes and proper application; keeping spray equipment clean and in good repair; record keeping; scouting; proactive weed identification, and so on.

Control of CLEARFIELD Volunteers: Control volunteers prior to flowering; minimizing seed losses at harvest; pay close attention to timeliness of harvesting; make correct adjustments in the header; seal all holes and cracks in harvesting equipment which allow spillage, even of small quantities of seed, (especially in the table, front elevator and grain tank); clean out harvest equipment before switching fields; practice good stubble management after harvest in light of crop rotation decisions; use pre-seed glyphosate application to control weeds and volunteers that emerge prior to seeding; volunteers from CLEARFIELD crops can be effectively

controlled by herbicides currently registered for control of conventional crops, with the exception of Group 2 herbicides.

Out-crossing: Control all volunteers in the season after growing a CLEARFIELD crop; if the same type of crop is grown the year following a CLEARFIELD crop – for example, conventional wheat following CLEARFIELD wheat – do not save seed from the second crop. Saved seed may contain both varieties, which may increase the likelihood of out-crossing when next planted; maintain hygiene along fence-lines and in areas adjacent to CLEARFIELD crops (road ditches, field borders, fence rows) through the use of non-ALS herbicides and/or mowing prior to seed set.

Another aspect of our stewardship initiatives is the guidelines BASF has developed for growers who wish to seed multiple CLEARFIELD crops. While BASF currently offers the CLEARFIELD Production System for canola and wheat, we are working to diversify our CLEARFIELD portfolio through the development and commercialization of additional herbicide-tolerant crops. While individual CLEARFIELD crops often fit certain geographies, cropping systems and rotations, we recognize that there may be growers who wish to seed multiple CLEARFIELD crops in a given rotation, so we have developed recommendations accordingly.

Proactive Communication

These stewardship initiatives, guidelines and recommendations are not effective, however, unless they are communicated to those growers actually using the CLEARFIELD Production System. Therefore, BASF has worked to ensure that opportunities for communication with CLEARFIELD Production System users are many, and BASF employs a variety of communication tools to ensure a certain level of frequency in terms of the information these growers receive that addresses stewardship of the technology. Examples of these communication tools include:

Technical bulletins that address our best management practices for each CLEARFIELD crop in production. These materials are widely distributed through the retail network, trade shows, direct mail, etc.

BASF presentation material/Business Representative messaging. Our Business Representatives have been trained on issues surrounding the sustainability of the CLEARFIELD Production System. This messaging is being built into the presentations used by Business Representatives in retailer and grower meetings.

BASF has established a secure website for our retailers. On this site we have stewardship information for each CLEARFIELD crop available for retail agronomists to utilize with their customers.

BASF has also established a secure grower website. This website is available to key grower customers and can be utilized to communicate stewardship recommendations directly to customers utilizing the CLEARFIELD technology.

BASF AgSolutions® (our toll-free information line) is available for growers and retailers to gain technical information on our products; also, this call centre group conducts outbound communication activities. When appropriate, BASF AgSolutions staff initiates stewardship communication directly with growers who are utilizing the CLEARFIELD Production System.

BASF is proud of the value our CLEARFIELD Production System delivers to Western Canadian growers. To help ensure the continued delivery of this value, BASF Canada's stewardship of the technology will continue to be a foremost priority.