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Docket ID No. EPA-HQ-OPP-2014-0195

2,4-D: New Use on Herbicide-Tolerant Corn and Soybean

Environmental Protection Agency

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Washington, DC 20460

**Re: 2,4-D: New Use on Herbicide-Tolerant Corn and Soybean**

The Weed Science Society of America (WSSA) is pleased to have the opportunity to submit comments in support of a decision for the registration of Enlist Duo herbicide. The WSSA was founded in 1956 as a non-profit professional society that fosters an awareness of weeds and their impact on our environment. We provide science-based information to the public and government policymakers while promoting research, education, and outreach activities. The WSSA and its affiliates, the Aquatic Plant Management Society, the Northeastern Weed Science Society, the North Central Weed Science Society, the Southern Weed Science Society, and the Western Society of Weed Science represent over 3000 members from around the world. Members include academic, governmental, and private industry research scientists, students and educators, extension educators, and federal, state, county, and private land managers.

Our member scientists have studied 2,4-D extensively. It has been safely and widely used across the country since the early 1950s. The registration of Enlist Duo would provide farmers the flexibility for new applications in corn and soybean with additional crop planting options. Use of 2,4-D in diversified weed management programs in soybeans and corn is compatible with current farming practices. Registration of Enlist Duo will provide new postemergence options that will allow farmers to effectively manage their weeds in conservation tillage practices even in the presence of glyphosate resistant populations. Postemergence weed control has been an important tool in conservation tillage systems and 2,4-D can be an important part of this system. We ask EPA to carefully consider all aspects of the Enlist Duo label that pertain to herbicide resistance management as well as off-target herbicide movement.

As the spread of glyphosate-resistant weeds have occurred, the adoption of tillage, including deep tillage with a moldboard plow, has once again become more common. The return of conventional tillage has led to increased wind and water erosion. The new uses of 2,4-D would not eliminate tillage, but may allow farmers to return to more reduced-tillage production systems.

Science has clearly shown that there is a risk of resistance development to all herbicides, and 2,4-D is no exception. In fact, weeds have developed resistance to nearly all forms of weed control including herbicides, tillage, mowing and hand weeding. The use of 2,4-D in genetically engineered 2,4-D tolerant crops is an additional weed management tool for inclusion in an integrated weed management program. However, there is concern that growers may adopt and rely too heavily on these new uses of 2,4-D which makes education on its proper use in herbicide resistance management critical. The use of Enlist Duo in corn and soybeans, in accordance with herbicide resistance best management practices (BMP's), can extend the life of other existing herbicide chemistries.

**The proposed Herbicide Resistance Management section on Enlist Duo label as well as the Stewardship Program required of the registrant sets a precedent for managing this issue.** WSSA compliments EPA for taking a proactive and creative approach to herbicide resistance management (HRM). WSSA also applauds EPA's use of the concepts and principles in the peer-reviewed publication, Norsworthy, et al., "Reducing the Risks of Herbicide Resistance: Best Management Practices and Recommendations," *Weed Science* 2012 Special Issue: 31–62.

The overall impression is that the Stewardship Program (SP) concepts are good and could be helpful if implemented appropriately along with continuing evaluation. However, while many of the elements of the proposed for Enlist Duo will be helpful in HRM, **we have identified a number of significant concerns that must be addressed in order for the proposed SP to be successful.** This new SP approach is complex and has many seen and, possibly, unforeseen implications. WSSA is still working towards a consensus recommendation on many of the details of the proposed SP. As it is not possible to finish this work ahead of the public comment deadline, WSSA would welcome the opportunity to offer technical and scientific expertise on how best reach the specific goals of the SP, to present its ideas, and to discuss the SP with EPA at a later date. WSSA would particularly be interested in discussing EPA's specific goals for an SP and plans to assess its effectiveness.

**An overall recommendation of WSSA is that the SP be flexible, allowing for local adaptations and practices, particularly for the management of suspected resistant populations, which are known to be effective.**

**WSSA's concerns about the proposed SP are summarized below:**

- The proposed Enlist Duo registration requirements for a SP for HRM could be a precedent for future herbicide products. Therefore, the proposed requirements should be broadly applicable to all herbicides and herbicide uses. It is suggested EPA develop a general guidance that applies to all herbicides. All herbicides, whether used on genetically engineered crops or not, provide a selection pressure that can result in resistant weeds if HRM stewardship practices are not employed (Vencill, et al., "Herbicide Resistance: Toward an Understanding of Resistance Development and the Impact of Herbicide-Resistant Crops," *Weed Science* 2012 Special Issue: 2–30).

- For example, the existence of multiple registrations across companies for 2,4-D and/or glyphosate makes it difficult to address resistance issues through the current proposal that only applies to Enlist Duo.
- EPA should consider issuing guidance on the general approach to HRM that it desires to see for herbicide labeling, registrations and stewardship plans. This will provide important information to registrants in preparing their submissions. It will provide uniformity of approach across herbicides and not an herbicide specific HRM recommendation. We believe that if the proposed approaches to HRM prove effective for the specific registration under consideration they would also have utility more broadly for herbicide resistance management.
- There is utility in knowing when new biotypes or populations of weed species not previously reported to have resistance are identified and their geographic location and spread. EPA should distinguish between follow-up on performance inquiries on fields where resistance was previously confirmed and those where herbicide resistance is suspected. The SP could use multiple approaches to collect information on both resistant species and their infestations building on the current “6(a)(2) adverse environmental impact” reporting required now. However, at some point, if the occurrence of a resistant species becomes very widespread, further reporting of the locations of the resistant biotype or populations is no longer useful and should be considered unnecessary. This should be assessed annually. In the case of widespread resistance, the registrant should be encouraged to reflect this fact on the herbicide label.
- Proposed investigation of claims of non-performance must allow for various approaches used in the marketplace, allow focus on fields where herbicide resistance was not been previously reported i.e. not every case of non-performance needs to be investigated by on-site visits. For example, phone interviews, perhaps with supporting digital images, could be conducted first to determine if the non-performance has the characteristics outlined in Norsworthy et al. (2012) of a resistant population.
- Scouting is a HRM best management practice (BMP) and should continue to be strongly recommended. However, the proposed *requirements* around scouting are too restrictive, due to limitations in enforcement, acreage involved, and specificity which could cause farmers and applicators to not want to report populations of concern for resistance. The wording should reflect recommendations for the most effective scouting time frames, not requirements.
- When a new weed population or biotype suspected of being resistant is detected, BMP’s that control the weed population and limit its spread are appropriate and should be implemented. The requirement for eradication of resistant weeds is untenable as eradication means the complete elimination of weeds which cannot be accomplished except in very specific cases. **WSSA urges EPA to remove references to “eradication” from the document.** By the time a resistant weed population is sufficiently large to see, the soil seed bank has already become a reservoir for seeds of the resistant biotype. Only multi-year strategies that employ a comprehensive management plan will likely be successful in managing the resistant population. Resistance management stewardship

programs should emphasize the development of a working relationship between the product registrant, the affected grower, State Weed Science Extension and other professional agricultural consultants and advisors. In this way, control approaches for populations of concern can be developed on a case-by-case basis as appropriate for the weed species, the location and whether or not resistance has been previously identified in the species.

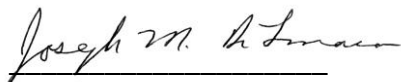
- WSSA agrees that action must be taken to manage suspected new resistant weed populations in fields that have not been previously reported to have resistance and that follow-up on the site with the population of concern is needed.
- The reporting of new resistant biotypes and fields with resistance can be useful to HRM. However, the frequency of this reporting should be re-evaluated. It is unclear that monthly reporting would be more useful than annual public reporting of suspected resistance cases. The WSSA could host a forum for discussion of the reported suspected resistance cases.
- Privacy and ownership rights are at question in both the reporting and management requirements of the SP. Decisions on management practices are made by farmers and/or the landowner. A registrant can make recommendations and even supply alternate products, but cannot mandate that the farmer use these resources to control resistant weeds. Care must be taken in designing the SP to protect property rights and to avoid inhibiting the adoption of weed resistance BMPs or in the reporting of suspected resistance. As discussed above, only the application of a resistance management plan practiced over years is effective in managing a resistant weed population. This is best designed with the input of State Weed Science Extension Specialists and other professional agricultural consultants and advisors. It may be necessary and appropriate for local Weed Science Extension to develop a resistance management plan for an entire geographical area, such as a valley or county, to prevent the spread of a resistant weed for any type of mitigation to be effective. It may also be necessary to have a data collection plan on the adoption and effectiveness of such management schemes.
- Bioassays are an effective way to confirm resistance and development of a specific diagnostic test may be impossible. There are multiple mechanisms known to confer resistance to individual herbicides depending upon the herbicide mechanism of action and chemistry and the weed species. Having a diagnostic test would likely require unique tests for each species and each mechanism within each species and may result in false negatives if a new resistance mechanism has evolved. Additionally, while the confirmation of resistance is useful and of interest to the registrant, it is not necessary for an effective SP. Reporting of suspected resistance is sufficient for the purposes of the SP.
- WSSA agrees that it is reasonable to expect that Dow AgroSciences and other technology providers include the following basic elements as part of a resistance management plan:

- Encourage timely scouting before and after application. This has to be tailored to the weed problems, product, and geography.
  - Enhance their complaint management processes by training company representatives on how to best recognize cases of possible resistance and a means by which these cases can be escalated within the organization to obtain timely attention.
  - A commitment to provide growers with information, recommendations, and assistance as to how they can manage cases of suspected resistance when they are identified on their farm.
  - A commitment to work with growers and advisors in geographies where suspected resistance is occurring and reinforce BMPs and resistance management tools developed by local state Weed Science Extension.
  - Compilation of investigations into resistance cases, follow up actions, and results into meaningful reports and maps, sharing of information with academics and regulators for annual discussion and potential public dissemination.
  - All processes must have some degree of flexibility to account for differences in geographies, company structure, and individual farm operations.
- WSSA supports the science based risk assessment required under FIFRA. Broad-spectrum herbicides such as Enlist Duo control many weeds and the occurrence of resistance in one or a few weed species does not eliminate the utility of such a product if used in the context of an appropriate management plan.

In closing, WSSA supports the timely registration of Enlist Duo with appropriate provisions to steward its safe use and to provide for its continued efficacy. New and expanded uses of existing herbicides are needed for integrated weed management programs in order to mitigate weed resistance and meet our current and future crop production needs.

The proposed Stewardship Program for Enlist Duo sets a precedent for managing this issue for other herbicide chemistries and we feel it is very important to “get it right”, while not placing an undue burden on farmers, registrants, agricultural consultants and advisors, and the State Weed Science Extension specialists. The WSSA looks forward to working with EPA on these issues, while discussing the Agency’s specific goals in requiring a SP and how it plans to assess its effectiveness.

Sincerely,



Dr. Joseph M. DiTomaso  
President  
Weed Science Society of America

## References

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