APCRP: Comparing Generic Aquatic Herbicides with Proprietary Counterparts

Service

Invasive submersed, floating, and emergent aquatic plants are continuously introduced into the U.S. and once established, can impact U.S. Army Corps of Engineers (USACE), State, and other public water bodies. Nuisance vegetation disrupts waterborne transportation, blocks potable water and irrigation intakes, degrades water quality, and displaces native plant and wildlife communities (Getsinger et al. 2014). Chemical control, or the use of registered aquatic herbicides, is a technique that is widely employed by aquatic plant managers in the U.S. (Netherland 2014). U.S.



Figure 1. Mesocosm facility at Louisiana State University that will be used to compare generic herbicides with proprietary counterparts.

Environmental Protection Agency (USEPA) registered aquatic herbicides have been used to prevent further spread and control existing populations.

The original pesticide registrant has a 17 year patent for proprietary rights for name, formula, and production of the proprietary brand-name or trademark product when it is initially registered (McFalls et al. 2015). After this period, any company can synthesize/manufacture or distribute the herbicide under a different name (i.e., off-patent herbicide) (McFalls et al. 2015), commonly referred to as "generic" products. Although there are only 14 active ingredients registered as aquatic herbicides by the USEPA for Nation-wide use (Section 3 Registration) (Netherland and Jones 2012; University of Florida 2014), there are multiple registrants selling generic herbicides. As a result, end users have a large selection of available options when choosing aquatic herbicides for their vegetation management needs.

There are advantages and disadvantages to using either a proprietary or generic aquatic herbicide. Often, proprietary herbicide manufacturers provide better customer/product support service and some level of product warranty to protect the end-user for unacceptable performance. In addition, brand name and/or manufacturer recognition is a selling point to the end user. Conversely, proprietary herbicides may come with added costs even after patent expiration, as the proprietary registrants are still trying to recover costs expended during initial discovery, development, registration, and marketing expenses. Alternatively, generic products often have a lower initial product cost than their brand-name counterpart (McFalls et al. 2015), which allows these products to be less expensive since the manufacturer does not pay the full cost of development and/or registration. However, the generic product may carry a negative connotation/stigma of being a second rate product even though it has the same active ingredient and percent composition as the proprietary herbicide. As with any product being sold on the open market (pesticide, pharmaceutical, etc.), a generic counterpart should deliver the same or similar level of performance (i.e., efficacy) as the proprietary herbicide to be used as a viable alternative. Although active ingredient disclosure is required by the USEPA, inert or inactive ingredients such as solvents, stabilizers, emulsifiers, surfactants and other additives can vary between proprietary and generic formulations.

Limited research has been conducted to evaluate generic vs. proprietary aquatic herbicides. Most of the previous research has focused on subsurface applications of the aquatic herbicides fluridone and copper (Langeland et al. 2002; Koschnick et al. 2003; Bultemeier et al. 2009; Turnage et al. 2015). Similarly, agriculture research has evaluated foliar applications of glyphosate, triclopyr, clopyralid, glufosinate, and metsulfuron-methyl for efficacy against a variety of weed species (Hinklin et al. 2002; Cadenhead et al. 2007; Siekman and Sandell 2008; Latiff et al. 2009; Kendig 2016). The limited data directly comparing herbicide performance in an aquatic setting has forced managers to rely on product name brand recognition as well as trial and error. Often, the resource manager or the end user does not know if the chosen product is as effective as other available options, as well as, the value or benefit of the product chosen.

Due to the limited amount of literature and anecdotal evidence comparing aquatic herbicides head-to-head, replicated research is needed to fully understand the utility of generic herbicides. Therefore, the objective of this research is to evaluate the efficacy of several commonly used generic and proprietary herbicides, specifically 2,4-D, glyphosate, diquat, imazapyr, and triclopyr against key aquatic species that are problematic on Corps projects. Outdoor mesocosm facilities at Louisiana State University (LSU) (Baton Rouge, LA)(Figure 1) and environmental growth chambers at the Engineer Research and Development Center-Environmental Laboratory (ERDC-EL) (Vicksburg, MS) will be used to evaluate the aforementioned herbicides against floating, emergent, and submersed plant species under replicated and controlled conditions. A field research phase will be conducted via demonstration plots to verify results of small-scale trials.

Status

These studies will require a 3-year implementation period to thoroughly investigate the proprietary and generic herbicides. In addition, information will be obtained from USEPA Office of Pesticide Programs to clarify the Agency's process for registering proprietary and generic herbicide products with respect to toxicity testing and treatment of inert ingredients.

Lessons Learned or Success Stories

Information will be available with future events.

Get It Here

Information on generic or proprietary herbicide selection will be available to natural resource managers via APCRP Technical Notes, peer-reviewed journal articles, and documentation of field demonstrations at the end of FY17 and continue through the end of FY19. These publications will provide guidance for field-level management of invasive plant species using generic or proprietary products.

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Related Links

Aquatic Plant Control Research Program (link to come)

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Keywords

Active ingredient, emergent aquatic plants, floating aquatic plants, generic herbicides, invasive species, proprietary herbicides submersed aquatic plants, tradename herbicides.



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