UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

OFFICE OF CHEMICAL SAFETY AND POLLUTION PREVENTION

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MEMORANDUM

SUBJECT: Response to Bayer CropScience's "Flubendiamide Aquatic Risk: Evaluations of (1) USGS Stream Monitoring and (2) Proximity of Farm Ponds to Crop Areas with Flubendiamide Use" (no MRID number) submitted through email dated June 22nd, 2015

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Introduction

Bayer CropScience (BCS) submitted comments in a document entitled "Flubendiamide Aquatic Risk: Evaluations of (1) USGS Stream Monitoring and (2) Proximity of Farm Ponds to Crop Areas with Flubendiamide Use". This submission follows a series of back-and-forth comments and responses following the Flubendiamide farm pond monitoring study reports submitted by BCS (MRIDs 49415301 to 49415303) and addresses three topics: 1) the USGS water monitoring data; 2) "water bodies and farm ponds in flubendiamide use areas"; and 3) proposes aquatic photolysis as an explanation for the 66-day mesocosm half-life. **After consideration of this information, EFED concludes that the information contained in this submission would not**

change the conclusions of previous EFED responses subsequent to the pond studies or previous EFED risk assessments.

Discussion

USGS Stream Monitoring

BCS's comments on USGS monitoring data compare the USGS sampling sites to flubendiamide sales data and make additional comments on expectations of flubendiamide concentrations in unfiltered samples vs. USGS filtered samples. The comparison of USGS sampling data to flubendiamide sales data showed that the USGS had sampled in some of the high sales areas. No description was found in this document of how the zip code-level sales data were calculated. Assuming the mapped sales data are standardized to the area of the zip code, this sales data could be useful for interpreting any future monitoring data.

In the filtered vs. unfiltered discussion, the registrant concludes that unfiltered samples should have less than 2× higher flubendiamide concentrations than filtered samples, which would still not result in exceedances of levels of concern (LOCs) in streams and rivers (flowing water bodies). In summary, the registrant's overall conclusion in this section is: 1) considering the USGS data captures the high sales areas; 2) the unfiltered samples should not exceed twice the filtered samples; and 3) mathematically converting the USGS filtered to unfiltered samples did not result in LOC exceedances; therefore, it is unlikely that unfiltered samples exceed LOCs in flowing water anywhere in the U.S.

The Agency does not agree or disagree with the registrant's argument, but rather feels the point concerning the USGS samples being filtered was missed by the registrant. EFED is interpreting the registrant pond monitoring study data (MRID 49415303), which found accumulation in ponds and detections in unfiltered samples from streams/rivers in the pond watersheds monitored, as providing evidence that detections in the USGS streams/rivers likely indicates accumulation in lentic waterbodies (wetlands, ponds, lakes and estuaries) within those USGS monitored watersheds. EFED's point was not that EPA expected exceedances in flowing water bodies, but rather that the widespread detections in the USGS filtered flowing water samples indicate that accumulation in lentic waterbodies across the U.S. is likely even more widespread than indicated by the filtered USGS water column samples. (Note that USGS does not have a sediment method for flubendiamide and/or des-iodo at this time and typically samples flowing waterbodies.)

Proximity of Farm Ponds to Crop Areas with Flubendiamide Use

In the registrant's comments on water bodies and farm ponds in flubendiamide use areas, the registrant seems to conclude based on GIS (Geographic Information System) data that relatively few farm ponds are in arid flubendiamide use areas and farm ponds are more common in wetter climates where ponds would be expected to overflow. This line of discussion seems to be predicated on the idea that the Agency is only concerned about farm ponds; therefore, any flubendiamide- and/or des-iodo-laden runoff not captured by a farm pond is of no concern to EPA. As previously discussed relative to farm pond overflow, any flubendiamide and des-iodo in runoff *not* accumulated in a farm pond will simply accumulate in the depositional zone of some other higher-value aquatic environment (reservoirs, lakes, or estuaries) causing more problems.

EFED models farm ponds because they are relatively easy to model and serve as surrogates for other aquatic environments, not because farm ponds are the only aquatic resource of concern.

Aquatic Photolysis as an Explanation for the 66-day Mesocosm Study Half-life

BCS proposed aquatic photolysis as an explanation for the 66-day mesocosm half-life. In the flubendiamide aerobic and anaerobic aquatic metabolism studies (MRIDS 46816913 and 46816914) as well as the mesocosm study (MRID 46817002), flubendiamide is introduced similarly into the water layer and then partitions into the sediment. In the aerobic and anaerobic aquatic metabolism study, the flubendiamide concentration in sediment exceeds the concentration in water within 4 days (*i.e.*, the majority of flubendiamide has partitioned or moved from water into sediment within 4 days). However in the mesocosm study the concentration in sediment never even approaches the concentration in water within the 112 day duration of the mesocosm study.

The amount of material measured in the mesocosm study water samples appears to be relatively similar to the aerobic and anaerobic aquatic metabolism studies (*i.e.*, appears to be slowly partitioning to sediment in a dynamic equilibrium at similar rates across all three studies). It is the mesocosm sediment data that does not make sense when compared to the aerobic and anaerobic aquatic metabolism studies' sediment data. There simply does not appear to be enough material in the mesocosm sediment to maintain the dynamic equilibrium between the sediment and water concentrations in the mesocosm study.

Aquatic photolysis which occurs in the upper layers of water would not explain the lack of flubendiamide in the sediment. As stated previously, it is far more likely that the mesocosm half-life is problematic rather than the aerobic and anaerobic aquatic metabolism studies since the mesocosm study is not designed to measure half-lives whereas the aerobic and anaerobic aquatic metabolism studies are designed to measure half-lives.

Additionally, the aquatic photolysis study produced two additional identified degradates (and other unidentified degradates) that would probably be of concern to the Agency because the identified degradates are structurally very similar to flubendiamide and des-iodo. Therefore even if aquatic photolysis were a suitable explanation for the mesocosm half-life (which it is not), EFED still would not use the mesocosm half-life because the additional degradates of concern in the aquatic photolysis study were not measured in the mesocosm study (*i.e.*, we would need the data for the additional photolysis identified and unidentified degradates to calculate the total half-life for all of the degradates of concern).