CENTER FOR FOOD SAFETY

October 25, 2021

OPP Docket
Environmental Protection Agency
Docket Center (EPA/DC), (28221T)
1200 Pennsylvania Ave. NW.
Washington, DC 20460-0001

RE: Docket EPA-HQ-OPP-2021-0575
Comments on draft Biological Evaluations for the neonicotinoid insecticides clothianidin, imidacloprid and thiamethoxam

Center for Food Safety (CFS) appreciates the opportunity to comment on the EPA's draft Biological Evaluations (BE's) of the neonicotinoid insecticides clothianidin, imidacloprid and thiamethoxam.

These comments will focus on EPA's discussion of seed treatment uses of these insecticides, which was deficient in many ways. We have attached our comments on the proposed interim registration review decisions for five neonicotinoid insecticides that includes the three at issue here and contains additional analysis relevant to these BE's (CFS 2020).

EPA fails to provide any information on the usage of these insecticides as coatings on the seeds of numerous crops, despite the fact that seed treatments are by far their predominant use. Nor does EPA provide any quantitative analysis of environmental exposure to or the associated risk to any listed organism ensuing from seed treatment uses. Finally, to the extent that EPA addresses seed treatments at all, the discussion is filled with false premises, arbitrary choices, and misdirection away from those uses that are of most concern. It misrepresents and mischaracterizes rather than enlightens.

Seed Treatment Usage Data

The first issue is also the simplest. As detailed below, the vast majority of thiamethoxam and clothianidin, and at least half of imidacloprid, are coated onto seeds prior to planting rather than sprayed or deployed as soil drenches. Yet EPA entirely excludes seed treatments in reporting usage, and moreover falsely characterizes the "minus seed treatment" usage as ***total agricultural use***. These blatant errors give the Services and the public the false impression that agricultural neonicotinoid use is many times less than it in fact is, and ***must be corrected*** in the final Biological Evaluations.

In reading EPA's draft BE's, one would have no clue that virtually all of the corn and the majority of soybean seed – the two most widely planted crops in the U.S. – are treated with a

neonicotinoid insecticide; nor that "[f]rom 2000 to 2012, virtually all neonicotinoids applied to maize, soybeans, and wheat were applied as seed treatments" (Douglas and Tooker 2015). Nor would one realize that seed treatments are a major use on dozens of other major and minor crops, unless one were to happen upon a single page buried deep in one of the innumerable attachments and appendices to the BEs, where EPA notes that thiomethoxam, clothianidin and imidacloprid are registered for seed treatment uses on an incredible 102, 61 and 39 crops, respectively (Thiomethoxam BE, App. 4-5, p. 20; Clothianidin BE, App. 4-5, p. 20; Imidacloprid BE, App. 4-5, p. 25).

The easiest way to see the magnitude of EPA's misrepresentations is to compare its statements on "total agricultural use" under Section 4.2: Usage Data of Chapter 1 of each draft BE (p. 1-3 in each) with the best available information on total agricultural use, including seed treatment use, of these neonicotinoids as reported by the U.S. Geological Survey (USGS). For instance, EPA states: "Between 2014 and 2018, the national annual total agricultural usage averaged approximately 180,000 pounds of thiamethoxam over 3.1 million acres (including foliar and soil applications)." (Thiamethoxam BE, Chap. 1-3). This statement is false. In fact, the best available estimate of total agricultural use is 1,432,000 lbs./year, eight-fold more. ***Total agricultural use of clothianidin is over 70-fold more than EPA reports.*** (see table below). Thus, the "total agricultural use" of the three neonicotinoids combined, as reported by EPA, represents just 16%, or one-sixth, of actual use.

Insecticide	EPA "Total Ag'l Use" Excludes Seed Treatments (lbs/year)	USGS Total Ag'l Use 2014 Includes Seed Treatments (lbs/year)	% Total = Seed Treatment
Thiamethoxam	180,000	1,432,000	87%
Clothianidin	50,000	3,700,000	99%
Imidacloprid	891,400	2,000,000	55%
TOTALS	1,121,400	7,132,000	84%

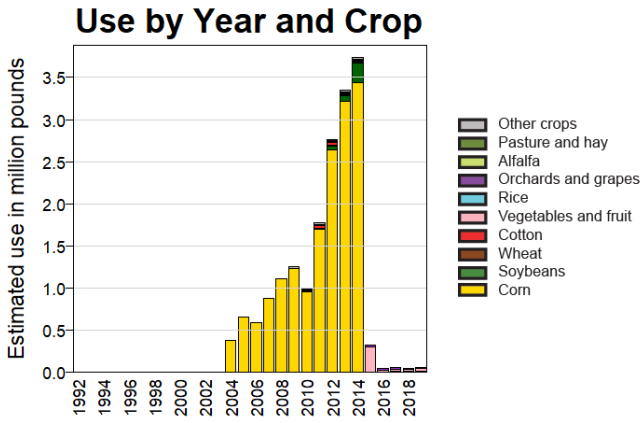
Sources: EPA figures from Section 4.2: Usage Data, Chapter 1 of each draft BE; USGS figures from visual inspection of "Use by Year and Crop" graph, 2014 Epest-Low, for each neonicotinoid, at https://water.usgs.gov/nawqa/pnsp/usage/maps/compound_listing.php. % Total = Seed Treatment is the quotient of (USGS Total minus EPA Total)/USGS Total.

EPA's pretext for excluding seed treatments is that reliable data are hard to come by. For instance: "Quantitative seed treatment usage data are difficult to obtain due to the complexities of capturing this usage information from growers (where seed treatment typically occurs)." (Thiomethoxam BE, App. 4-5, p. 20). This statement is misleading in two ways. First, EPA has at least a decade's worth of reliable data on total agricultural use of neonicotinoids, including seed treatments, that the Agency is conveniently ignoring here. The Agency's Biological and Economics Analysis Division (BEAD) reported total agricultural use, including breakouts of seed treatment uses for major crops including corn, cotton, soybean, potatoes, sorghum, sugar beets and wheat, in Screening Level Usage Estimate (SLUA) reports (EPA 12/30/15, 1/26/16 and 3/14/17). In fact, these SLUA's also give percent area treated estimates for both seed treatment and other uses over the 2005 to 2015 period.

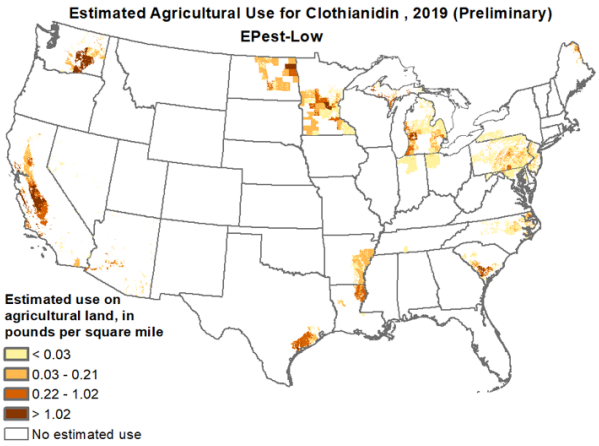
Second, contrary to EPA, growers do not typically treat their own seeds. For the two largest uses, corn and soybeans, practically all seed is treated off-farm – by the seed dealer or the seed dealer's supplier (Douglas and Tooker 2015, Figure 2). This is likely true for many

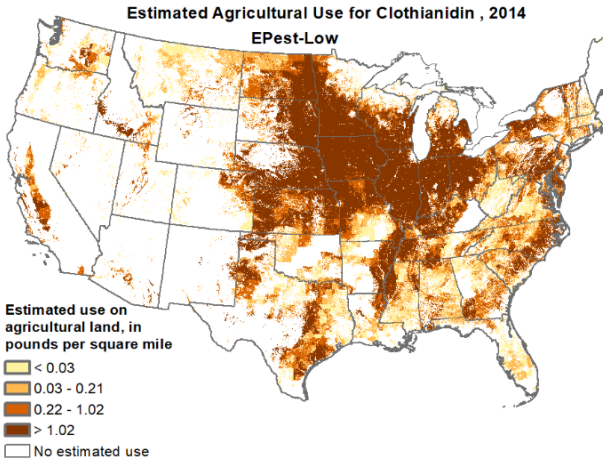
other crop seeds as well. If EPA were really interested in obtaining seed treatment usage data, it could require the neonicotinoid manufacturers, and/or the seed and chemical dealers who distribute their seed and pesticide products, to supply such information as a condition of the registrations. Regardless, the information on seed treatments that EPA does possess constitutes the best available scientific and commercial data on this predominant use of the neonicotinoids at issue here, and must be used.

Seed treatment use of the neonicotinoids (and other pesticides) was reported through 2014 by the U.S. Geological Survey, which relies upon data supplied by the private firm Kynetec (Douglas and Tooker 2005). For unexplained reasons, Kynetec, whose biggest customers for their pesticide usage data reporting services are major pesticide firms, decided to stop collecting seed treatment data after 2014. This coincided with a flurry of scientific papers reporting on both seed treatment uses and the many adverse effects of neonicotinoids. As of 2014, neonicotinoid seed treatment use was rising on major crops, and with corn in particular the average amount used per seed was rising (Ibid.). Thus, there is every reason to believe seed treatment uses are at least as great today as they were in 2014, and most likely considerably higher.



Beginning 2015, the provider of the surveyed pesticide data used to derive the county-level use estimates discontinued making estimates for seed treatment application of pesticides because of complexity and uncertainty. Pesticide use estimates prior to 2015 include estimates with seed treatment application.

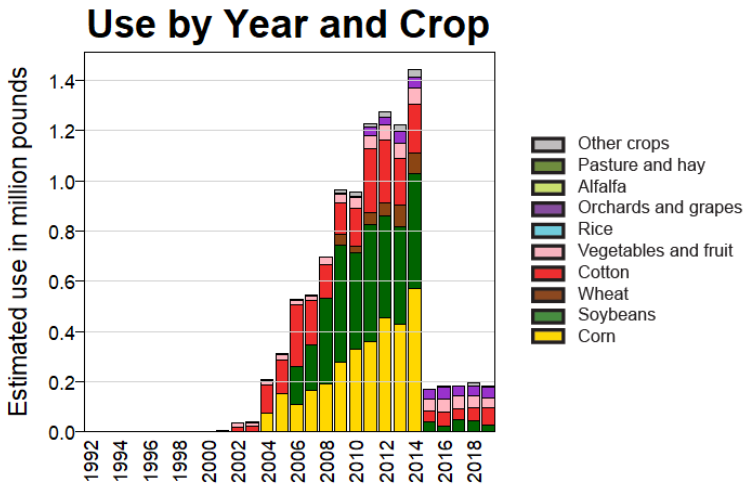


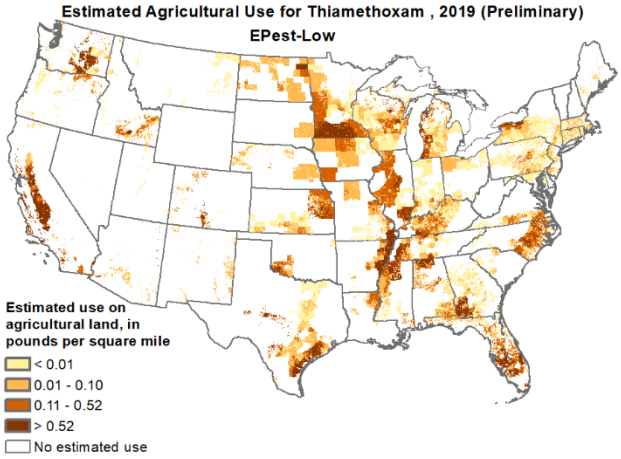


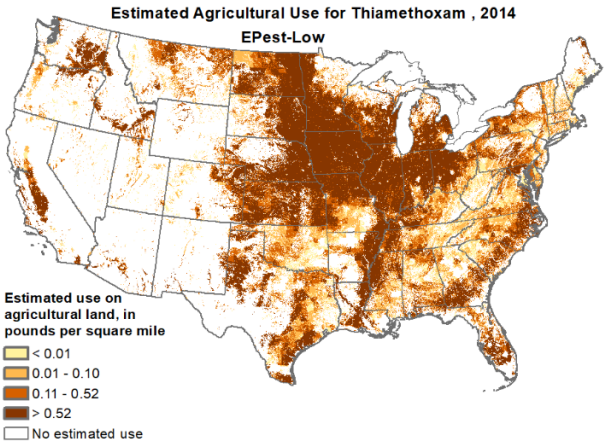
Source: https://water.usgs.gov/nawqa/pnsp/usage/maps/show_map.php?year=2019&map=CLOTHIANIDIN&hilo=L&disp=Clothianidin

The graphics above display clothianidin use rising dramatically on corn from 2004 through 2014, and soybean use rising from 2012 to 2014, when Kynetec stopped reporting seed treatments. The 2019 map represents roughly speaking EPA's assessment of 50,000 lbs/year clothinanidin use, which excludes seed treatments, while the 2014 map represents the best available information on actual agricultural use, which includes seed treatments.

The graphics below display the same for thiamethoxam. For both pesticides, the difference in color intensity between the 2014 and 2019 maps represents seed treatment uses, which are concentrated heavily in the Corn Belt, the center of corn and soybean cultivation in the U.S. and the region with the most intensive use of these two major neonicotinoid insecticides. For thiomethoxam, there is also considerable amounts used to treat cotton seed.







Source:https://water.usgs.gov/nawqa/pnsp/usage/maps/show_map.php?year=2014&map=THIAMETHOXAM&hilo=L

Seed treatment "analysis"

In line with EPA's refusal to report seed treatment usage data, the Agency also refused to conduct any sort of meaningful (i.e. quantitative) risk assessment of these uses. To take thiomethoxam as an example, EPA notes that it did not assess seed treatment applications quantitatively, but rather only qualitatively in Appendix 4-5 (Thiomethoam BE, Chapt. 3, Section

3.5.4). In Appendix 4-5, EPA assumes that flowable uses will result in greater aquatic environmental concentrations than seed treatment uses. EPA acknowledges that neonicotinoid seed dust kills bees, but fails to assess the issue because it has not developed methods to do so. This is no excuse. EPA could develop methods to assess this important and deadly exposure route, following the lead of independent researchers (e.g. Krupke et al. 2017), but chooses not to. The bulk of EPA's qualitative consideration of seed treatment uses is an "exploratory spatial analysis to determine where seed treatment usage would be informative" (Thiomethoxam BE, App. 4-5, pp. 20-34).

This "analysis" is not worth the paper it is written on, for several reasons. First, EPA arbitrarily excludes from its "analysis" the crops that represent by far the largest seed treatment uses in terms of pounds – corn and soybeans, to a lesser extent wheat – on the grounds that only neonicotinoid-treated crops that are grown in "geographically specific areas" are of interest, and these large-acreage crops are widely grown and so inappropriate. This is an arbitrary and senseless exclusion criterion; of concern is the amount of neonicotinoid introduced into the environment where listed species may be exposed to it, not whether this occurs on a broad or a "geographically specific" scale.

Second, EPA arbitrarily chooses to focus its "analysis" on minor crop categories rather than major ones – Other Grains and Vegetables and Ground Fruit, primarily.

Third, EPA does not bring into its analysis a single metric of ***how much*** neonicotinoid is used: either on a single seed or on a treated seeds per acre basis; nor does EPA consult available information on what percentage of a given crop seed is treated. For instance, with corn we know that each kernel is treated with from 0.25 to 1.25 milligrams of clothianidin or thiamethoxam (Krupke et al. 2012); this permits calculation of the amount of neonicotinoid on an acre of treated seed (or a range); and we also know that very nearly 100% of corn seed planted in the U.S. is treated with neonicotinioids (Douglas and Tooker 2015). Without metrics of usage to estimate exposure, EPA cannot address the risk question.

In short, this entire discussion of 30 pages or so appears designed to distract attention from the by far major seed treatment uses of neonicotinoids, which occur on corn and soybean seeds, and the impacts that such uses are having on listed species and their critical habitats.

Poultry Litter Applications

EPA conducts a back-of-the-envelope calculation to estimate how much thiamethoxam (similarly for the other two neonicotinoids) is introduced to the environment when poultry litter from poultry houses treated with thiamethoxam for control of flies and darkling beetles is applied to corn fields as a soil amendment (Thiamethoxam BE, Chapter 3, Section 3.5.3). In a bizarre twist, EPA then uses the results of this "poultry litter" scenario in place of and to represent the scenario of planting a field with thiomethoxam-treated corn seed (Ibid., Section 3.5.4). Elsewhere, we learn that less than 500 pounds of thiomethoxam is applied to poultry houses annually (Thiomethoxam BE, Chapter 1, Section 4.2), while roughly 600,000 lbs. of thiomethoxam are applied to the nation's corn seeds (see thiomethoxam graph above).

Similarly, EPA substitutes an assessment of clothianidin in poultry litter for one of clothianidin on corn seeds, the latter of which amounts to over 3 million lbs. of the insecticide (Clothianidin BE, Chapter 3, Sections 3.5.4 & 3.5.5), and similarly for imidacloprid (Imidacloprid BE, Chapter 3, Sections 3.5.5 & 3.5.6).

Exposure Through Pollen and Nectar and Other Plant Tissues

Nowhere did we find a discussion by EPA of exposure of listed organisms to thiamethoxam, clothianidin or imidacloprid in the nectar, pollen or other parts of plants systemically intoxicated with these insecticides from seed treatments. It does not appear that EPA conducted any sort of risk assessment for this route of exposure, either. The mismatch between the independent scientific literature, where hundreds of publications have addressed every aspect of seed treatment use of neonicotinoids – from levels found in various plant tissues, both those whose seeds are directly treated as well as field-edge plants; to toxicity thresholds for all manner of pollinators, insects and other organisms; to risk assessments – to EPA's dismissal of this exposure route could not be more striking.

We have attached comments submitted to EPA for the interim registration review decisions for five neonicotinoids, including the three at issue here, for further analysis that is relevant to these draft Biological Evaluations

Conclusion

We urge EPA to correct the blatant errors in reporting the usage of these neonicotinoids, as discussed above. EPA should also quantitatively assess seed treatment uses of these neonicotinoids, taking account of independent scientific literature on their prevalence, environmental concentrations, lethal and sublethal toxicity threshold for various organisms, and their persistence especially in the soil, which could give rise to accumulating levels over seasons.

The results of such a re-assessment might well lead to some NLAA determinations changing to LAA's, or to the strength of evidence increasing for some LAA determinations. Regardless, these assessments are designed to provide both the public and the expert wildlife Services with accurate, credible information on these highly toxic insecticides, and as currently written the draft BE's grossly misrepresent the use of thiomethoxam, clothianidin and imidacloprid in U.S. agriculture.

Bill Freese, Science Director
Center for Food Safety

References

CFS (2020). Center for Food Safety's comments to EPA on the Proposed Interim Registration Review Decisions for Several Neonicotinoid Pesticides: Imidacloprid, Clothianidin, Thiamethoxam, Acetamiprid and Dinotefuran. Center for Food Safety, May 4, 2020.
EPA-HQ-OPP-2008-0844: Imidacloprid
EPA-HQ-OPP-2011-0865: Clothianidin
EPA-HQ-OPP-2011-0581: Thiamethoxam
EPA-HQ-OPP-2011-0920: Dinotefuran
EPA-HQ-OPP-2012-0329: Acetamiprid

Douglas MR and Tooker JF (2015). Large-Scale Deployment of Seed Treatments Has Driven Rapid Increase in Use of Neonicotinoid Insecticides and Preemptive Pest Management in U.S. Field Crops. Environmental Science & Technology 49(8): 5088-97.

EPA (3/14/17). Screening Level Usage Analysis (SLUA) or Imidaclopid (129099), Biological and Economics Analysis Division, EPA, March 14, 2017. https://www.regulations.gov/document/EPA-HQ-OPP-2008-0844-1609.

EPA (1/26/16). Screening Level Usage Analysis (SLUA) for Thiamethoxam (060109). Biological and Economics Analysis Division, EPA, January 26, 2016. https://www.regulations.gov/document/EPA-HQ-OPP-2011-0581-0358.

EPA (12/30/15). Screening Level Estimates of Agricultural Uses of Clothianidin (044309): Reporting Time: 2005-2014. Biological and Economics Analysis Division, EPA, December 30, 2015. https://www.regulations.gov/document/EPA-HQ-OPP-2011-0865-1176.

Krupke CH et al. (2017). Planting of neonicotinoid-treated maize poses risks for honey bees and other non-target organisms over a wide area without consistent crop yield benefit. Journal of Applied Ecology 54: 1449-1458.

Krupke CH et al. (2012). Multiple Routes of Pesticide Exposure for Honey Bees Living Near Agricultural Fields. PLOS One 7(1): e29268.