CENTER FOR FOOD SAFETY

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Jan. 23, 2015

OPP Docket
Environmental Protection Agency Docket Center
Washington, DC
Filed online at: *www.regulations.gov*

Re: Benefits of Neonicotinoid Seed Treatments to Soybean Production; Docket No. EPA–HQ–OPP–2014–0737

Dear Sir/Madam,

Center for Food Safety (CFS) is pleased to submit this comment to the above-referenced docket on the assessment dated Oct. 15, 2014, by Myers and Hill, entitled: *Benefits of Neonicotinoid Seed Treatments to Soybean Production* (hereinafter, the "Assessment"). This is supplemental to the Dec. 22, 2014, comment on this Assessment that CFS endorsed together with 15 other public interest groups. That comment is re-attached and incorporated herein by reference.[1]

Our focus here is on an unpublished insecticide-industry "Meta-Analysis Approach" report issued by a consultant group AgInfomatics, which claims to assess a broad number of studies on yield effects of the neonicotinoid insecticides.[2]

- First we note the lack of any peer-review or other independent support for the validity of the meta-analysis approach in that report. The purpose of peer-review prior to publication

[1] We have reviewed the docket and not seen our prior multi-group comment posted; please ensure it is considered. Docket Tracking Number: 1jy-8g77-99bd

[2] On Growing Matters website, at http://growingmatters.org/studies/yield/study/ ; also referenced in comment in docket by AgInfomatics LLC and relied on in numerous comments from soybean farmers and pesticide industry-connected stakeholders.

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is to provide disinterested assurance of the general validity of the methods the investigators used. Due to lack of any peer review, the AgInfomatics analysis should be discounted.

- Second, AgInfomatics acknowledged a very serious bias in their "meta" approach. At pp. 15, AgInfomatics admits the reports in its database likely focused on (soybean) test plots with known or artificial high pest pressures, rather than more typical plots. Plainly, the non-peer reviewed, registrant-funded, studies more likely aimed at demonstrating efficacy where the target pests occurred in high densities. Peer-reviewed studies at least would have had a greater likelihood of that bias being corrected by including comparisons with medium and low pest pressure plots. At p. 15, AgInfomatics admits it did not control its averaging exercise for pest pressure due to the large amount of data that would need to be considered. That is a fundamental defect in their simplified averaging approach. Unfortunately, p. 4, Tab1e 1, of their paper shows that for soybeans the vast majority of reported studies - **250 of 314 (80%)** - were "Registrant-Funded" studies as opposed to only **64 (20%)** being "Publications". **Thus, appropriate discounting of the claimed average yield benefit is needed to account for this likely overall high pest pressure bias. Additional discounting is needed to account for the very low proportion of the papers AgInfomatics used in its averaging approach that were independent of the pesticide industry or were peer-reviewed publications.**

- Third, we note that as far as soybean efficacy studies, the AgInfomatics *Appendix of Data References* neglected to consider at least four peer-reviewed, journal-published articles referenced in EPA's Assessment that found marginal, zero or even negative yield effects from using coated soybean seeds: McCornack and Ragsdale (2006); Ohnesorg et al. (2009); Tinsley et al. (2012); and Douglas et al. (2014) (full citations in the Appendix below). Summaries of the first three studies in the Appendix are taken from the CFS report *Heavy Costs: Weighing the Value of Neonicotinoid Insecticides in Agriculture*.[3] The authors' summary of the Douglas et al. paper from Pennsylvania State University also is included; it was published after *Heavy Costs* and the AgInfomatics meta-data report were issued (but it was cited in manuscript form by EPA in its Assessment). **It is plain that if the AgInfomatics calculations had included these four published studies then their already very low claimed average yield benefit would have been even lower or non-existent.** Also, AgInfomatics excluded a published 2011 soybean study from Brazil that also showed poor results from the technology.[4] Again, these peer-

[3] 2014 report by the Center for Food Safety, Washington, DC. At: www.centerforfoodsafety.org/reports/2999/heavy-costs-weighing-the-value-of-neonicotinoid-insecticides-in-agriculture ,

[4] Bueno AD, Batistela MJ, Bueno RCOD, Franca-Neto JD, Nishikawa MAN, and Liberio, A. 2011. Effects of integrated pest management, biological control and prophylactic use of insecticides on the management and sustainability of soybeans. *Crop Protection*, 30: 937–945.

reviewed, controlled test results need to be given more weight by EPA than non-peer reviewed papers of questionable rigor and objectivity.

- Fourth, the Douglas et al. paper's showing of **5% yield drag due to decimation of beneficial predatory insects** needs to be highlighted by EPA in its decision-making. Foreseeable harm to yields and to "beneficials" cannot be "averaged out" in the AgInfomatics meta-analysis as far as EPA's regulatory responsibility is concerned. The agency has a duty to warn users of foreseeable harms from pesticide use and, as indicated in our prior 16-NGO comment, **EPA should suspend this altogether as a defective pesticide product with utterly inadequate label warnings, at least across the Mid-Atlantic Region.**

- Fifth, even accepting for the sake of argument the validity of the AgInfomatics averaging approach, their conclusions do not favor continuation of the registrations for the soybean coating products. The suggested overall yield benefits across the nation from this industry-funded report, pp. 10-13, Tables 2 and 3 and Fig. 2, are extremely low - **only 2.8% compared to no seed treatment and 0.2% compared to use of non-neonicotinoid insecticide**. These are insignificant claims compared to the heavy national monetary and other costs these products impose, as outlined in our prior 16 NGO comment, i.e., environmental persistence and direct and indirect harms including to honey bees and beekeepers, reduced pollinated crop yields for many types of farmers, reduced honey crop, reduced bee products, in addition to harms to other pollinators, other beneficial insects, organic agriculture generally, water quality and wildlife, as well as jeopardy to Federally-listed threatened and endangered species and to ecosystem sustainability.[5] Shockingly, Table 3 indicates that the **205 "registrant-funded" studies comparing seed treatments to other non-neonicotinoid insecticide use found 0.0% (zero) average yield benefit, indicating the registrants have long known the coating "benefits" are illusory.** Pages 28-29, Fig.s 1 through 6, present vivid documentation that industry was aware of well over 100 research plots showing yield reductions in a high variety of contexts across the nation. Predictable harms to yields are thoroughly documented for several States. As with the Douglas et al. results, **EPA must take action to warn and protect farmers from these persistent and harmful yield drag results.**

- Sixth, EPA should note that, at p. 15, AgInfomatics indicates the findings from it dubious "meta-data) approach are the foundation of various subsequent economic benefit reports it points to there (e.g., "Mitchell and Dong 2014" and "Hurley and Mitchell 2014"). In view of the numerous inadequacies in their averaging, discussed above, the subsequent reports are correspondingly flawed.

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- Seventh, we have reviewed other comments in the docket to date and found none from the registrants that correct the deficiencies cited above or otherwise reliably rebut EPA's professional Assessment. The comment in the docket by Bailey et al., dated Dec. 22, on behalf of 18 field crop entomologists focused in the Northern United States strongly affirms EPA's Assessment's basic conclusions on lack of efficacy. More than 80 percent of U.S. soybean acreage is concentrated in the upper Midwest.[6] This is a critical fact because there are several comments from Extension professionals in the docket claiming efficacy of these coatings. However, those comments are heavily focused on the Deep South where only a minor soybean crop is grown. While there are many "pro-neonic" comments from soybean farmers there also are large numbers of "anti-neonic" comments from beekeepers and other important stakeholders. The farmer comments should be discounted by the substantial incentivizing by industry. According to a recent agriculture industry media report: *"Seed companies are pushing treated seed," one farmer pointed out. "As a selling point, they guarantee full replant if you pick treated soybean seed."*[7]

In conclusion, the AgInfomatics "Meta-data Approach" and other information in the docket to date do not rebut EPA's fundamental findings of lack of efficacy. Actually, the AgInfomatics report, when discounted for its various biases and omissions, serves to reinforce EPA's Assessment on soybean yields. The national costs of these soybean coating products far exceed their illusory benefits and they should be suspended.

For further information and to respond to this comment, please contact: Peter T. Jenkins, Attorney/consultant, CFS, at 202.547.9359 or pjenkins@centerforfoodsafety.org .

Sincerely,

/s/ Peter T. Jenkins

Attachment

CC: White House Pollinator Task Force c/o Michael Stebbins, Assistant Director, Biotechnology, Office of Science and Technology Policy

APPENDIX

[6] See: map; NASS Soybeans: Planted Acreage by County, http://www.nass.usda.gov/Charts_and_Maps/Crops_County/sb-pl.asp .

[7] Unglesbee, E. 2015. "Corn, Soybean Growers Advised to Reel in Insect Control Costs." *AgFax.Com*, Jan. 16, online at: http://agfax.com/2015/01/16/corn-soybean-growers-advised-reel-insect-control-costs-dtn/#sthash.M1hHEnsO.dpuf

Summaries of journal-published studies on soybean seed coating efficacy that are not cited in the AgInfomatics "Meta-Analysis Approach":

McCornack, BP and DW Ragsdale. 2006. Efficacy of thiamethoxam to suppress soybean aphid populations in Minnesota soybean. *Crop Management,* 5(1).

The authors trialed thiamethoxam seed treatment to manage soybean aphid populations in Minnesota. Their results showed that thiamethoxam significantly reduced aphid pressure and reproduction but was only effective at causing aphid mortality and reducing reproduction during early vegetative growth stages. Late season aphid infestations cannot be controlled with seed treatment, and cannot be predicted at planting, so could require additional foliar applications, negating any advantage from using treated seed. Thiamethoxam did not significantly increase yield in years with low aphid density, but did increase yield in one year with high aphid pressure as compared to the untreated control (but was not significantly different from foliar spray plots). "In terms of yield, there was no advantage using a seed treatment over a foliar applied insecticide in any location-year." The authors concluded "at planting application of thiamethoxam for soybean aphid control provides little consistent benefit to the grower."

Ohnesorg, WJ, KD Johnson, and ME O'Neal. 2009. Impact of reduced-risk insecticides on soybean aphid and associated natural enemies. *Journal of Economic Entomology,* 102(5): 1816- 1826.

The researchers utilized imidacloprid and thiamethoxam seed treatments to control soybean aphids in fields in Iowa. They compared seed treatments to foliar insecticides and an untreated control. The plots with foliar insecticides had lower soybean aphid populations and higher yields than those with seed-applied insecticides. During the first year of the experiment, some of the seed treatments provided significant yield benefits compared to the untreated control. In both years, the untreated control and seed treatment plots had the greatest exposure to aphid pressure, and in the second year, with moderate aphid pressure, there was no yield advantage from treating fields for aphids. The neonicotinoid seed treatments "provided limited, inconsistent yield protection to soybean that was occasionally not significantly different from the untreated control."

Tinsley, NA, KL Steffey, RE Estes, JR Heeren, ME Gray, and BW Diers. 2012. Field-level effects of preventative management tactics on soybean aphids (*Aphis glycines* Matsumara) and their predators. *Journal of Applied Entomology,* 136: 361-371.

The researchers investigated the control of soybean aphids provided by aphid-resistant soybean lines and by thiamethoxam seed treatment. Soybean aphids reached economically significant levels in both years. Resistant plants experienced fewer cumulative aphid days, but yields were not significantly different. Thiamethoxam also reduced cumulative aphid days in one year of the study, but not the second year, and did not provide a yield benefit. "Evidence for the ability of thiamethoxam to reduce densities of soybean aphids in this experiment was inconclusive." Seed treatments are less effective against late-season pests—thiamethoxam's utility is limited and dependent on the timing of the infestation because the bioactivity of the compound declines throughout the season. This study "reinforces the economic utility of scouting for soybean aphids and only applying a foliar insecticide when densities reach economically threatening levels."

Douglas MR, Rohr JR., Tooker JF. 2014. Neonicotinoid insecticide travels through a soil food chain, disrupting biological control of non-target pests and decreasing soybean yield. *Journal of Applied Ecology* doi: 10.1111/1365-2664.12372

Summary (by authors)

1. Neonicotinoids are the most widely used insecticides world-wide, but their fate in the environment remains unclear, as does their potential to influence non-target species and the roles they play in agroecosystems.
2. We investigated in laboratory and field studies the influence of the neonicotinoid thiamethoxam, applied as a coating to soya bean seeds, on interactions among soya beans, nontarget molluscan herbivores and their insect predators.
3. In the laboratory, the pest slug *Deroceras reticulatum* was unaffected by thiamethoxam, but transmitted the toxin to predaceous beetles (*Chlaenius tricolor*), impairing or killing >60%.
4. In the field, thiamethoxam-based seed treatments depressed activity–density of arthropod predators, thereby relaxing predation of slugs and reducing soya bean densities by 19% and yield by 5%.
5. Neonicotinoid residue analyses revealed that insecticide concentrations declined through the food chain, but levels in field-collected slugs (up to 500 ng g _1) were still high enough to harm insect predators.
6. Synthesis and applications. Our findings reveal a previously unconsidered ecological pathway through which neonicotinoid use can unintentionally reduce biological

control and crop yield. Trophic transfer of neonicotinoids challenges the notion that seed-applied toxins precisely target herbivorous pests and highlights the need to consider predatory arthropods and soil communities in neonicotinoid risk assessment and stewardship.