National Cotton Council OF AMERICA

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May 4, 2020

Office of Pesticide Programs
Regulatory Public Docket (7502P)
U.S. Environmental Protection Agency
One Potomac Yard (South Building)
2777 S. Crystal Drive
Arlington, VA 22202

RE: Docket No. EPA-HQ-OPP-2011-0581

Dear Mr. Matthew Khan,

The National Cotton Council (NCC) appreciates this opportunity to provide comments on the Environmental Protection Agency's (EPA's) "Thiamethoxam Proposed Interim Registration Review Decision." The NCC appreciates the EPA's compliance with the Food Quality Protection Act (FQPA) and the Federal Insecticide, Fungicide and Rodenticide Act (FIFRA), and acknowledges the many accomplishments of the EPA that has resulted in enhancing the safety of U.S. food and fiber production for consumers. The NCC does not believe the general public fully understands the extreme measures employed by EPA to assure crop protection products, when used as labeled, continue to provide the public with affordable, safe food and fiber. The NCC has reviewed the Proposed Interim Decision (PID) for the neonicotinoid thiamethoxam and identifies inconsistencies and concerns for EPA's consideration prior to a final decision.

The NCC is the central organization of the United States cotton industry. Its members include producers, ginners, cottonseed processors and merchandizers, merchants, cooperatives, warehousers and textile manufacturers. A majority of the industry is concentrated in 17 cotton-producing states stretching from California to Virginia. U.S. cotton producers cultivate between 9 and 12 million acres of cotton, with production averaging 12 to 18 million 480-lb bales annually. The downstream manufacturers of cotton apparel and home furnishings are located in virtually every state. Farms and businesses directly involved in the production, distribution and processing of cotton employ more than 125,000 workers and produce direct business revenue of more than $21 billion. Annual cotton production is valued at more than $5.5 billion at the farm gate, the point at which the producer markets the crop. Accounting for the ripple effect of cotton through the broader economy, direct and indirect employment surpasses 280,000 workers with economic activity of almost $100 billion. In addition to the cotton fiber, cottonseed products are used for livestock feed and cottonseed oil are used as an ingredient in food products, as well as being a premium cooking oil.

The NCC compliments EPA for the thorough and comprehensive human health risk assessment, and NCC believes the EPA's Human Health Risk Assessment clearly shows that the labeled uses of this product are safe. The NCC urges EPA to acknowledge the human health safety of this product in the public benefits consideration. Many of the historical pest management products exhibited broad spectrum activity and resulted in a greater disruption of the in-field balance of pests and beneficial insects. Theoretical concepts of target specific approaches continue to be pursued, but product classes such as the neonicotinoids (neonics) greatly enhance the ability to control pests without major disruption to the in-field pest-beneficial complex. NCC encourages the recognition of evolving improvements in pest management capabilities and their public benefits. Additionally, NCC recognizes the importance of rotating active ingredient modes of action (MOA) as a component of resistance management. With few effective products available for management of piercing/sucking pests, it is imperative to maintain the availability of unique modes of action such as the neonics. It is additionally imperative to recognize regional differences of pest presence and effective utilization of the MOA for individual crops. The NCC also compliments university extension experts who continue to develop science-based recommendations to control pests while minimizing resistance development.

Pollinator Risk Assessment or Hazard Assessment

The NCC continues its disagreement with EPA's pollinator risk assessment and conclusion that foliar neonicotinoid crop protection practices in cotton present high risk to honeybees. The NCC has provided research studies that show cotton is not a preferred food source for honeybees, but is utilized by honeybees in time of limited food alternatives. Additionally, NCC has provided data to EPA demonstrating: 1) that cotton is self-pollinated, 2) that cotton has an extremely short duration of an individual flower being open (generally 3 days), and 3) that the cotton flowering process is staggered in a sequence (meaning few flowers per plant are open at a given time). The NCC has also provided studies that placed high numbers of hives around a cotton field to attempt to achieve cross pollination, but the scientist reported that most of the honeybees left the cotton field area for desert flowers in Arizona (McGregor 1959). The NCC continues to note scientific studies to show that, while honeybees do utilize cotton nectar under some circumstances, it is an unattractive food source. Honeybees do not collect cotton pollen, and many scientific articles note the honeybees groom the pollen from their body before returning to the hive.

EPA's pollinator risk assessment overestimates cotton's portion of the honeybee diet, ignores the diversity of the honeybee diet, assumes 100% of the bees are present in cotton fields leading to potential exposure, and thereby overestimates the risk to honeybees. The NCC understands risk is based on both toxicity (hazard) and exposure (probability of exposure). However, the risk assessment completed by the Agency force exposure and, therefore, is based solely on toxicity making it overly conservative.

The NCC understands the challenge of identifying exposure, but urges EPA to recognize the need for improved risk analysis involving exposure. Recent landscape studies have provided more understanding of the diversity of honeybee diet within their foraging range. Probabilistic modeling simulating landscape diversity should be explored to improve the pollinator risk assessment.

Reducing Use Rates

The NCC urges EPA to exercise caution with mandated rate reductions. Principles of Insect Resistance Management have shown the application rate or dose of an active ingredient can significantly impact the rate of resistance development. The frequency of resistant alleles within the insect population will be accelerated with the use of a dose that increases survival of heterozygous individuals. Initially, the resistant allele will be predominantly in the heterozygous population with very few homozygous individuals present. Utilizing a dose that does not kill a larger portion of the heterozygous individuals will rapidly increase the number of homozygous resistant individuals and rapidly destroy the utility of the product. The "diagnostic dose" that essentially kills all heterozygous individuals is often referred to as the High Dose Strategy and is the basis for most resistance management strategies. The diagnostic dose is different for each pest population. The NCC would urge EPA to carefully consider efficacy data before mandating a rate reduction that may not meet the High Dose Strategy.

The NCC notes the rate reduction is a major change for the use in cotton and is solely driven by the pollinator risk assessment. The NCC views this as a great concern given the limited decisions that have reached interim decision with the relatively new pollinator risk assessment. The NCC has noted scientific concerns regarding assumptions currently embraced in EPA's pollinator risk assessment above.

Given the likely precedent that will be set with this decision, the NCC must request an exemption for nectariless varieties of cotton. The restrictions associated with rate reduction are solely based on assumptions of bees ingesting nectar from treated cotton. If nectaries are not present, the potential for this ingestion is removed and the risk of concern no longer is supported. Without the risk, there is no justification to alter the use rates.

Nectariless cotton is a well-documented, natural trait identified in the 1960's. Several lines of the nectariless trait have been developed over the years. For more information, refer to Zeng et. al. 2018, Breeding and Genetics: History and Current Research in the USDA-ARS Cotton Breeding Program at Stoneville, MS, Journal of Cotton Science 22: 24-35. Cotton varieties continually change driven by yield and quality characteristics. Nectariless traits remain in the breeding programs and market. At one time, one nectariless trait was planted on over 80% of the cotton acreage in Mississippi. Marketed varieties involve many plant characteristics, but nectariless varieties should not be subjected to restrictions based solely on assumptions of nectar. Therefore, the NCC requests label language acknowledging nectariless cotton.

Spray Drift

The NCC understands EPA's scientific reasoning that larger droplets reduce drift and for a systemic product, the large droplet should not reduce efficacy. The NCC appreciates EPA's reasoning for systemic products. However, NCC urges EPA to recognize this option may not be appropriate for many products. Additional research is needed in this area to verify potential risks for resistance development, low dose exposure, or reduced efficacy resulting from large droplet size. The NCC continues to urge advancements in application technology research and is encouraged by numerous advancements underway. The NCC urges EPA to consider encouraging adoption of improved technology (such as hooded applications) during the labeling process.

Inconsistency of Appendix

The NCC notes the details and explanations in the PID address several specific crops, but the language in some areas of Appendix A and Appendix B seem inconsistent with the document. The NCC realizes the inconsistencies could be related to clerical error, but we urge EPA to revise the Appendix to reflect the content in the document. In particular, the NCC would note *page 64, row 1* seems highly inconsistent with the document and should be deleted. The language seems to imply all outdoor uses, as part of the label direction, and would eliminate uses for indeterminant crops not requiring contract pollination while providing use for those requiring contract pollination. The NCC believes this must be a clerical error due to the dramatic difference from the document details.

Aquatic Invertebrates

The NCC continues to urge EPA to seek refinement and validation of the current models that suggest large sediment movement. The NCC does not believe the model reflects today's agricultural practices and implies a rate of soil loss that is not occurring. Many agricultural production practice changes have focused on minimizing soil loss, and great advancements have been documented by USDA-NRCS.

The NCC has previously expressed concerns with the "maintained vegetative filter strip", and how such language complies with other label language regarding weeds around the field for weed resistance management or pollinator management. The NCC expresses concerns that vegetative buffer strips can easily serve as a nursery for insect pests, as well as a source to spread weeds into the fields.

Benefits

Aphids and Whiteflies

The NCC would like to clarify that aphids and whiteflies are a concern in every cotton region and are typically present, but do not always reach treatment criteria. Many factors must be considered in aphid and whitefly management in each region. Drought stress, presence of honey dew, stage of the cotton crop, diversity and proximity of other crops (for example as row crops and vegetable crops in CA, AZ, and GA must consider resistance selection from each other) and many other factors (including reports of natural aphid fungus in some regions) complicate the decision to invest more money for aphid control and/or whitefly control. For aphids, producers can wait for the fungal epizootic too long and suffer yield loss. At times, producers make the aphid treatment and the epizootic occurs within a few days. The producer's treatment decision is complex. Tremendous research efforts have attempted to develop cost savings for cotton producers by monitoring and alerting growers of indications that the aphid fungal epizootic may occur (Steinkraus and Hollingsworth 1994, Hollingsworth et al. 1995, Steinkraus and Slaymaker 1994, Steinkraus et al. 2002). Unfortunately, aphid populations may occur at any stage of cotton production and the fungal epizootic is not always a reliable control, especially late season.

The NCC urges EPA to further understand the economic impact of honey dew and "sticky cotton" resulting from aphids and whiteflies. The potential occurrence of sticky cotton is a severe concern to the entire cotton industry supply chain. The EPA commented that the silverleaf whitefly is a pest that only sporadically reaches damaging levels of concerns. The NCC believes the EPA does not recognize the potential impact of sticky cotton for producers who do not have the tools to manage aphids and whiteflies. The rapid population increase (sometimes at a field level or area level, sometimes at a larger level) and the stage of plant development can result in honeydew on lint, termed "sticky cotton". Henneberry et al. 2001 (http://arizona.openrepository.com/arizona/handle/10150/211301) showed the association of aphids and honeydew resulting in sticky lint. Hector and Hodkinson (1989) reported over 80% of sticky cotton at textile mills was associated with aphids and whiteflies.

The research literature has numerous papers discussing the challenges to control aphid and whitefly outbreaks, and the extreme need for multiple modes of action (MOA) in rotation to avoid uncontrollable populations (Hequet et al., 2007, Sticky Cotton: Causes, Effects, and Prevention, USDA ARS Tech. Bull. No. 1915, 210pp; Nichols et. al. *Management of White Fly Resistance to Key Insecticide in Arizona*, http://www.cottoninc.com/fiber/AgriculturalDisciplines/Entomology/Whitefly/WhiteFlyResistance/;Whiteflies: *Cotton Insect Management Guide*, https://cottonbugs.tamu.edu/foliage-feeding-pests/whiteflies/). The biology and rapid population growth of aphids and whiteflies requires the availability of critical IRM tools. The loss of neonicotinoids could force additional applications of other MOA's that would not provide the control benefits and would limit producer's availability to rotate MOA's. Ellsworth et al. (1999, The University of Arizona, Cooperative Extension IPM Series No. 13, Stick Cotton Sources & Solutions) reported "insecticide treatment to specifically prevent stickiness has cost Southwestern cotton growers $47 million for aphids and $154 million for whiteflies from 1994-1998." The development and implementation of a new integrated system of whitefly management greatly reduced the cost, but optional management tools must remain available to comply with IRM recommendations.

Aphids and whiteflies do more than just reduce yield. The sugars they excrete impact the entire cotton chain – from producer yield losses, slowing ginning process by up to 25 % (Ellsworth et al., 1999), lowering grade and value $0.03/lb – $0.05/lb (Ellsworth et al. 1999), requiring extra efforts to spin fibers, requiring frequent shutdown of processing equipment to clean gumming of sugars, and potential reduction in final product due to staining and fiber grade. The seriousness of sticky cotton can impact entire regions as textile mills attempt to avoid purchase of sticky cotton.

Aphids also present a problem in scouting for caterpillar eggs and neonate larvae. When aphid populations reach a density that begins to show the shiny leaves (honeydew), it is difficult to determine the number of aphids present. A mere walk through the field will cover clothing with gummy residue from thousands of aphids brushed from the underside of leaves. The terminal of the cotton plant will most often be covered with aphids making it practically impossible for professional crop consultants to monitor for bollworm/budworm larvae. Often the producer/crop consultant will make a control treatment for aphids, not just for the concerns raised above, but also in fear of greater losses resulting from inability to monitor for bollworm/budworm eggs and larvae. Although the NCC does not agree that neonicotinoids have direct mortality for bollworms, the NCC believes the data confusion is likely due to premixes that are recommended when multiple pests are present in a cotton field (see premixes for multiple pests, page 16, https://extension.tennessee.edu/publications/Documents/PB1768.pdf).

Thrips, Lygus and Stinkbugs

In 2016, lygus, stink bugs, and thrips (Williams, 2016) were ranked the top three cotton insect pests in the U.S. Although there are geographical differences in species composition, collectively, these sucking insects have become the dominant pests of U.S. cotton for several years.

Thrips typically move into cotton fields early season, often shortly after germination of cotton seedlings. In general, neonicotinoid seed treatments have shown to greatly decrease the need for foliar control of thrips. Environmental factors (for example cool temperatures that delay the cotton plant growth thereby extending the period of time the plant remains susceptible to thrips injury) and some reports of thrips resistance to particular seed treatments require continued monitoring of seedling cotton for thrips and the ability, if needed, for foliar control applications. In the absence of effective systemic insecticides at planting, thrips would be a greater pest threat and more difficult to control.

Lygus (plant bugs) and stink bugs are highly mobile adults that feed on numerous alternative plant hosts and often move into fields from native vegetation near the cotton fields. The movement can occur throughout the cotton growing season and may require multiple applications during one growing season. Selection of an insecticide product targeting these pests MUST consider species complex, previous history of the area and any previous MOA's application.

Lygus hesperus is more common in the western regions of the U.S. and *Lygus lineolaris* is more common in the midsouth and southeast. Leigh et al. (1977) documented organophosphate resistance in *L. hesperus* in California and Cleveland and Furr (1980) documented *L. lineolaris* resistant to organophosphates in Mississippi. During a similar time, Schuster et al. (1987) reported *L. lineolaris* control failures in Texas. Snodgrass and Scott (1988) documented variation in resistance levels to dimethoate based on time of year and location, but reported little tolerance of *L. lineolaris* to acephate. Studies have continued to monitor the development of *Lygus* resistance to organophosphates, pyrethroids and other chemistries with much documentation demonstrating *Lygus* tolerance to the multiple chemistries and with variation during a given year and/or location (Parys et al., 2017, Luttrell et al. 2018). Because of the variation of *Lygus* resistance to multiple MOA's, many university extension scientists recommend tank mixing of MOA's for resistance management purposes. However, each tank mixing application often increases the cost of the application and reduces the amount of two MOA's that can be used for the remainder of the season due to label restrictions. Luttrell et al.

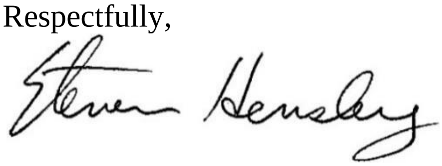
(2018) reported that total foliar sprays for plant bugs in the midsouth cotton region ranged from 3.4 to 5.8 applications per year (2008-2015). Considering that at least some of these applications were tank mixes with more than one MOA, increases the cost per application. These points illustrate the importance of multiple MOA's for resistance management purposes and for control of damaging cotton pests. Additionally, the above points illustrate the critical importance of taking the entire growing season into account rather than a snapshot view. You cannot simply conclude pyrethroids and organophosphates are alternatives. The recommendations by local university extension specialists and the producer's pest management strategies must have flexibility to adapt to variation in effectiveness of control strategies and thereby must have multiple tools available to make necessary adjustments. However, the benefits analysis fails to incorporate the need for multiple MOA's and fails to recognize yield loss due to documented resistance of products the EPA has identified as alternatives. The identified alternatives are already incorporated into the seasonal management strategies. Restrictions on the neonicotinoids would result in a greater reliance on the organophosphates and pyrethroids which, based on history, would likely result in control failures due to rapid increase in resistant genotypes.
The NCC notes that while control of *L. lineolaris* populations has been a greater challenge in the midsouth, similar experiences have been reported in recent years for parts of the southeast, particularly North Carolina (Dominic Reisig, North Carolina Cooperative Extension Service Entomologist, personal communication).

There are multiple species of stink bugs that may infest cotton, and brown stink bugs require different management strategies than other stink bug species (https://cottonbugs.tamu.edu/fruit-feeding-pests/stinkbugs/). However, if you have more than one species present in the field, control product selection becomes more difficult. The presence of multiple pests (for example bollworms, moderate aphid pressure, and stink bugs) adds to the complexity of the producer's pest control decisions. Add to that pest control applications made previously during the growing season, and the producer is limited on remaining available pest control options (either due to IRM strategies or in compliance with label restrictions that limit amount of product per year or period).

The NCC believes that, although EPA BEAD "concludes that the benefits of neonicotinoids are high during the pre-bloom and bloom period for cotton", EPA has greatly underestimated the benefits, has not been transparent regarding status of identified alternatives, and underestimated yield loss that would result from the restrictions (whether rate, application method, or use period).

Thank you for the opportunity to provide these comments on EPA's Proposed Interim Registration Review Decision for Thiamethoxam.

Respectfully,



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