UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460-0001

OFFICE OF CHEMICAL SAFETY
AND POLLUTION PREVENTION

November 25, 2014

Ms. Lydia Cox, Ph.D., DABT
Director of Regulatory Affairs
Nichino America, Inc.
4550 New Linden Hill Road, Suite 501
Wilmington, DE 19808

Subject: Acceptance of Petition for Extension of the Exclusive Use Data Protection Period for Fenpyroximate
Product Name: Fenpyroximate Technical
EPA Registration Number: 71711-18
Decision Number: 482862

Dear Ms. Cox:

This letter responds to your request dated September 06, 2013 that data associated with the original registration for the active ingredient fenpyroximate, dated April 27, 2004, receive a three-year extension of the original ten-year exclusive-use protection period from April 27, 2014 to April 27, 2017.

You cited section 3(c)(1)(F)(ii) of FIFRA as the authority for the Agency to make such a determination. The 1996 Food Quality Protection Act ("FQPA") amendments to FIFRA incorporated this subsection under 3(c)(1)(F). Section 3(c)(1)(F)(ii) of FIFRA sets forth the criteria for extending the period of exclusive-use protection. The period of exclusivity can be extended one (1) year for every three (3) qualifying minor uses registered within the first seven (7) years of an original registration whose data retains exclusive-use protection, with a maximum addition of three (3) years to the original ten-year exclusivity period.

The first step in determining whether data qualifies for an extension of its exclusive-use period is to ascertain whether there are exclusive-use data associated with a registration. Section 3(c)(1)(F)(i) of FIFRA and its implementing regulations specifically describe the set of data that are eligible for exclusive-use protection. A study entitled to exclusive-use protection is defined in 40 CFR § 152.83(c), and the following requirements must be met:

(1) The study pertains to a new active ingredient new chemical or new combination of active ingredients (new combination) first registered after September 30, 1978;

(2) The study was submitted in support of, or as a condition of approval of the application, resulting in the first registration of a product containing such new chemical or new combination (first registration), or an application to amend such registration to add a new use; and

(3) The study was not submitted to satisfy a data requirement imposed under section 3(c)(2)(B) of FIFRA; and a study is an exclusive-use study only during the 10-year period following the date of the first registration.

The following describes our analysis for determining whether the data associated with the registration you have cited contains exclusive-use data.

First, the data associated with this registration do pertain to, or have been derived from testing on, a new active ingredient that was first registered after September 30, 1978.

Second, the data were submitted in support of the first registration of the new chemical.[1] The registration cited was granted on April 27, 2004, and was the first registration for flonicamid with the product name Fenpyroximate Technical.

Third, the data were not submitted to satisfy section 3(c)(2)(B) of FIFRA.

Data generated by IR-4 are not entitled to exclusive-use protection (see 40 CFR § 152.94(b)). However, the Agency will count minor uses supported by IR-4-generated data when determining how many additional years that exclusive-use protection may be extended.

Although, EPA has determined that there are exclusive-use protected data associated with this registration, the Agency has not made individual determinations on every study associated with the above referenced registration as to exclusive-use protection. If the Agency receives a "Me-Too" application for this pesticide during the extension period citing Nichino America data, it will then address which of those data have the extension of protection; therefore, this response is a general determination that the exclusive-use studies associated with this registration will receive the determined extension of exclusive-use protection.

After determining that there are exclusive-use data associated with this registration, EPA analyzed whether: (1) minor uses have been registered within seven (7) years of the original registration; and (2) at least one of the following required criteria were satisfied for extending the exclusive-use protection pursuant to section 3(c)(1)(F)(ii) of FIFRA, and if so, by how many years. Section 3(c)(1)(F)(ii) of FIFRA states, in pertinent part:

> "The period of exclusive data use provided under clause (i) shall be extended 1 additional year for each 3 minor uses registered after the date of enactment of this clause, and within 7 years of the commencement of the exclusive-use period, up to a total of 3 additional years for all minor uses registered by the Administrator if the Administrator, in consultation with the Secretary of Agriculture, determines that, based on information provided by an applicant for registration or a registrant, that-
>
> (I) There are insufficient efficacious alternative registered pesticides available for the use;
>
> (II) The alternatives to the minor use pesticide pose greater risks to the environment or human health;
>
> (III) The minor use pesticide plays or will play a significant part in managing pest resistance; or
>
> (IV) The minor use pesticide plays or will play a significant part in an integrated pest management program."

Nichino America, submitted a petition to the Agency requesting that the exclusive use period be extended for three years for data submitted in support of the fenpyroximate registration. Nichino submitted information on 18 crops. Since three crops must meet the criteria for a one-year extension, nine crops need to meet at least one of the criteria to receive the maximum three-year extension.

---

[1] Data are not protected solely because they pertain to the new chemical, but because they are submitted in support of a particular product registration of a new chemical. Thus, data submitted to support an application for the second (and later) registrations, by whatever applicant, of a product containing the same new chemical acquire no exclusive-use protection. Additionally, data submitted in support of subsequent amendments to add new uses to the first registration of a product containing the new chemical gain exclusive-use protection, but the protection is limited to data that pertain solely to the new use. Thus, for example, if the new use is approved after eight (8) years of registration, the data supporting that use would gain exclusive-use protection for only two (2) years, or the reminder of the original 10-year exclusive-use period. See 49 FR 30884, 30889.

Fenpyroximate is the only chemistry in its specific Mode of Action grouping (21A) that is currently registered for seven minor uses that are included in the registrant's submission: hops, mint, okra, peppers, watermelons, eggplant, and strawberries. While growers have several options to manage the pests listed on the fenpyroximate label for these crops, EPA reviewed relevant scientific literature and extension recommendations and concludes that for at least two types of mites listed on the label (spider mites and European red mites), rotation of as many different Modes of Action is a critical component of delaying and managing the spread of pesticide resistance. Therefore, for these crops, EPA concludes that fenpyroximate plays or will play a significant part in managing pest resistance.

For the four citrus crops included in the request (mandarin oranges, lemons, limes, and grapefruit) also, EPA concludes that fenpyroximate meets the criterion of playing a potentially significant role in resistance management, where growers need to control the Asian citrus psyllid. This insect vectors the extremely destructive and incurable citrus greening disease. It requires repeated applications of many insecticides to stop or slow the spread of the disease, and the psyllid is showing resistance (in at least Florida) to several different Modes of Action. EPA that in these situations, fenpyroximate will be needed as a component of pesticide resistance management. In addition, EPA concludes that in these citrus crops, fenpyroximate plays a significant role in IPM programs, because it can be used to manage psyllids while also targeting mite pests that may co-occur.

Therefore, EPA concludes that at least one of the benefits-related criteria for extension of exclusive-use has been met for fenpyroximate in 11 crops included in the registrant's submission. This is sufficient for the maximum extension of exclusive use over the data. Details of the review follow below.

SUMMARY OF FINDINGS

Fenpyroximate is a pesticide with activity against various mites as well as a few whiteflies and psyllids (like mites, these insects also feed on plant sap and can serve as vectors of serious plant diseases). Fenpyroximate's chemical structure is based on that of the botanical insecticide rotenone. It is placed by the Insecticide Resistance Action Committee (an industry group of technical experts) in Mode of Action Group 21A (rotenone is in Group 21B). Other U.S.- registered chemicals included in Group 21A are pyridaben, tebufenpyrad, and tolfenpyrad.

Fenpyroximate has a pyrazole chemical structure and requires contact to affect target pests (i.e., it has no systemic activity). It acts by inhibiting mitochondrial complex I electron transport. This blocks cell respiration by preventing formation of adenosine triphosphate (ATP), causing the target pest to lose motor control. This in turn first stops feeding and reproduction, and ultimately causes death. All motile stages of mites are sensitive to fenpyroximate, as are the nymphs and adults of some species of psyllids, leafhoppers, whiteflies, and mealybugs. (Hollingsworth and Treacy 2006, UCIPM 2013a, Warner 2014).

Crops included in the registrant's submission

Nichino claims that fenpyroximate meets all four criteria for all 18 of the crops that it listed in its request. These crops are: **eggplant, pear, strawberry, pepper, wine grape, peach, tart cherry, mint (peppermint), Mandarin orange, lemons, limes, grapefruit, okra, pistachio, walnuts, potato, watermelon, and hops**. EPA verified that all the crops discussed are minor uses under the acreage definition except grapes and potatoes (USDA 2012). Nichino did not provide evidence that grapes or potatoes met the definition of minor use due to insufficient economic incentive. To reiterate, the registrant would qualify for three additional years of exclusive rights to data for fenpyroximate if nine crops meet any one of the regulatory criteria described earlier.

Support to qualify for criteria

Requirements for Criterion III: EPA would consider that Criterion III had been met in situations where there was compelling information that the insecticide being evaluated is used 1) to delay the development of pest resistance to other insecticides with different Modes of Action, or 2) where one or more of the target pests have already developed resistance to alternative acaricides.

Requirements for Criterion IV: Integrated Pest Management (IPM) is an important strategy for growers to maintain the productivity of crop land while potentially reducing the overall input and environmental impact of pest management tools such as pesticides. Among other things, IPM strategies can help minimize the impact of pesticides on beneficial organisms (such as pollinating insects, predators, and parasites). EPA would consider that Criterion IV had been met in situations where there was compelling information that fenpyroximate was useful in managing target pests as part of a larger IPM program that is intended to control the range of key pests in a given crop.

ASSESSMENT

EPA examined information submitted by the registrant, research and extension literature, as well as descriptions of pesticide Modes of Action (MoA) available through the Insecticide Resistance Action Committee (IRAC), a group of industry technical experts, to evaluate whether or not fenpyroximate reasonably plays a significant role in either managing pesticide resistance or integrated pest management (IPM) programs for each of the minor crops included in the registrant's submission.

Applicability of Criterion III to fenpyroximate

By checking the labels for pyridaben, tolfenpyrad, and tebufenpyrad, EPA verified the registrant's assertion that fenpyroximate is currently the only one of its MoA group that is available for hops, mint, okra, peppers, watermelons, eggplant, and strawberries (seven crops total).

Spider mites (*Tetranychus spp.*) are potentially serious pests on all these crops (see, for example, the many Crop Profiles and Pest Management Strategic Plans for these commodities, available at *www.ipmcenters.org*). These arthropods are well known to develop resistance rapidly and frequently, and across pesticides with many different MoAs (DeKeyser 2005, Van Leeuwen *et al.* 2009). Mite populations are favored by hot and dry conditions, under which they can increase dramatically, and do more damage since plants tend to be drought-stressed under these conditions (Bessin 2003, Porter *et al.* 2010). Extension recommendations advise using pesticides with different MoAs across a growing season as a key component of resistance management program (see, for example, Gut *et al.* 2002, Cloyd and Cowles 2010). Thus far, there appear to have been no reports of mite resistance to fenpyroximate in the United States, (MSU 2014). This adds to its suitability in current resistance management efforts where mites are the targets.

With these aspects in mind, EPA concludes that fenpyroximate, as the sole representative of its MoA in these seven crops, plays an important part in managing pesticide resistance where spider mites are concerned.

For the remaining crops included in the submission, the registrant acknowledged that one or more of the other members of fenpyroximate's MoA (pyridaben or tolfenpyrad) are also registered. Therefore, BEAD cannot make a clear determination that fenpyroximate plays a "significant part" in managing resistance where mites are target pests.

Applicability of Criterion IV to fenpyroximate

The registrant claimed that fenpyroximate meets this Criterion for all crops because it has "limited toxicity to predatory mite species and very low toxicity to Hymenoptera species, especially bees."

In the citrus minor crops included in the submission (Mandarin orange, lemons, limes, and grapefruit), where fenpyroximate can be used against both mites and the Asian citrus psyllid (ACP), *Diaphorina citri*, EPA concludes there is a reasonably compelling case for fenpyroximate being a key component of a larger IPM program. Where established, control of ACP needs frequent pesticide applications, largely to slow the spread of citrus greening disease, a major threat to citrus production that is caused by *Candidatus Liberibacter asiaticus*, a bacterium that is transmitted by the ACP when it feeds (Tiwari *et al.* 2011, UCIPM 2013).

The University of California's recent guidance to citrus growers seeking to manage ACP or mites includes fenpyroximate as a material "soft on natural enemies" material (UCIPM 2013a, b). Furthermore, fenpyroximate is one of the few insecticides active against ACP that can be "used at any time with reasonable safety to bees" (UCIPM 2014). Other materials are also available for psyllid management that are relatively "soft" in the way that fenpyroximate is (for example, abamectin and spinetoram). However, fenpyroximate is one of the few options available that has miticidal activity and is effective against both psyllid adults and nymphs. In addition, ACP is showing signs of developing resistance to several other classes of insecticides in U.S. citrus, but fenpyroximate's MoA is apparently not one of these (Tiwari *et al.* 2011). Thus, fenpyroximate arguably has a more significant role in an IPM program for ACP than do materials for which resistance has been detected (these currently include organophosphates, carbamates, neonicotinoids, pyrethroids, and spinetoram).

CONCLUSION

EPA concludes that fenpyroximate meets Criterion III for extension of the exclusive use period for seven crops (hops, mint, okra, peppers, watermelons, eggplant, and strawberries). Fenpyroximate should be a key component of these regimes given that it is the only representative of its MoA grouping in these crops. EPA further concludes that criterion IV is also met for all of these uses. Moreover, the Agency finds that fenpyroximate meets Criterion IV extension of the exclusive use period for an additional four crops (Mandarin orange, lemons, limes, and grapefruit). Growers targeting mites or all growth stages of the Asian citrus psyllid can use it as part of an IPM program that aims to allow natural enemies such as predatory mites to better survive (and thus help control mite pests that may co-occur with the psyllids) and also have lower impacts on pollinating insects such as honeybees. EPA therefore concludes that adequate criteria are met to support an extension of the exclusive use period for fenpyroximate for 3 years.

DETERMINATION

After reviewing your application, the Agency agrees that fenpyroxiamte satisfies one or more of the criteria mentioned up above for an extension of the original 10-year exclusive-use data protection period for 11 crops out of the 18 requested. Therefore, the Agency **GRANTS** your request for a three-year extension of exclusive-use data protection period for selected data under Fenpyroxiamte Technical (EPA Reg. No. 71711-18) for hops, mint, okra, peppers, watermelons, eggplant, strawberries, Mandarin orange, lemons, limes, and grapefruit . Exclusive-use protection for data, which complies with 40 CFR § 152.83(c), submitted in support of this registration will expire on **April 27, 2017**. A copy of our "Review of Justification for Extension of Exclusive Data Use Period for fenpyroximate," dated November 14, 2014, is enclosed for your use, reference, and information.

If you have any questions related to this letter, please contact Mr. Driss Benmhend at (703) 308-9525 or via e-mail at *Benmhend.driss@epa.gov* or Ms. Shaja B. Joyner at (703) 308-0029 or via e-mail at *Joyner.shaja@epa.gov*.

Sincerely yours,

Susan Lewis

Susan Lewis, Director
Registration Division (7505P)
Office of Pesticide Programs

cc: *Rachel Holloman / Marietta Echeverria*
Shaja B. Joyner / Kable B. Davis
Driss Benmhend
Michele Knorr
Diane Isbell

071711-00018 D48286

REFERENCES

Bessin. R. 2003. Two-spotted Spider Mites.. Publication "EntFact # 310" of the University of Kentucky Cooperative Extension Service. Available on the web at: http://www2.ca.uky.edu/entomology/entfacts/ef310.asp [Accessed October 2014].

Cloyd, R, A. and R.S. Cowles. 2010. Resistance Management: Resistance, Mode of Action, and Pesticide Rotation. Publication MF-2905 of the Kansas State University Agricultural Experiment Station and Cooperative Extension Service. Available on the web at: http://www.ksre.ksu.edu/bookstore/pubs/MF2905.pdf

Dekeyser, M.A. 2005. Acaricide mode of action. Pest Management Science, 61, 2, 103-110.

Gut, L., A. Schilder, R. Isaacs and P. McManus. 2002. Managing the Community of Pests and Beneficials. Ch. 2 In: Fruit Crop Ecology and Management. J. Landis and J. Sanchez (eds). Available on the web at: http://grapes.msu.edu/integrated_pest_management/how_pesticide_resistance_develops [Accessed September 2014].

Hollingworth, R. M. and M.F. Treacy. 2006. Classification and Properties of Commercial Insecticides and Acaricdes. Pp 36-67 In: Use and Management of Insecticides, Acaricdes, and Transgenic Crops. J.N. All and M.F. Treacy (eds). Joint publication of the Entomology Society of America and the American Phytopathological Society.

MSU. 2014. Arthropod Pesticide Resistance Database. Available on the web at www.pesticideresistance.com [Accessed October 2014].

Porter, P., G.B. Cronholm, R.D. Parker, N. Troxclair, E. Bynum, C.D. Patrick and S.P. Biles. 2010. Managing insect and mite pests of Texas corn. AgriLife Extension Texas A&M System, Publication E-400. Available on the web at: http://lubbock.tamu.edu/files/2011/11/Corn_Guide_2010.pdf [Accessed October 2014]

Tiwari, S., R.S. Mann, M. E. Rogers, and L.L. Stelinski. 2011. Insecticide resistance in field populations of Asian citrus psyllid in Florida. Pest. Manag. Sci. 67: 1258–1268.

UCIPM. 2013a. Asian Citrus Psyllid Distribution and Management: ACP Effective Insecticides. Available on the web at: http://ucanr.edu/sites/ACP/Grower_Options/Grower_Management/ACP_Effective_Insecticides [Accessed October 2014].

UCIPM. 2013b. Citrus: Selectivity of Insecticides and Miticides. Available on the web at: http://www.ipm.ucdavis.edu/PMG/r107300811.html [Accessed September 2014].

UCIPM. 2014. Citrus: Mandatory Intervals Between Application, Reentry, and Harvest, and Hazards to Bees. Available on the web at: http://www.ipm.ucdavis.edu/PMG/r107302911.html [Accessed October 2014].

USDA. 2012. Census of Agriculture: United States Summary and State Data. 695 pp. Available on the web at: www.agcensus.usda.gov [Accessed October 2014].

Van Leeuwen, T., J. Vontas, A. Tsagkarakou, and L. Tirry. 2009. Mechanisms of Acaricide Resistance in the Two-Spotted Spider Mite *Tetranychus urticae*, In: Biorational Control of Arthropod Pests, Ishaaya, I. & Horowitz, A.R. (ed.), 347-393, Springer, Dordrecht, the Netherlands.