Bumble bee visiting pollinator field border at Vilicus Farms. (Photo: Jennifer Hopwood, Xerces Society)

Unpacking the standards: A closer look at pesticide buffers

If you've followed our "Unpacking the Standards" series, you've probably noticed that Bee Better Certification requirements work together to respond to the risks of supporting pollinators on working farms. Each section of the standards adds support for healthy bee populations, but only when implemented together do they form a cohesive, successful whole

The interdependence of Bee Better's standards is particularly clear in its requirements for spatial or vegetative buffers around permanent habitat. Permanent habitat areas should provide pollinators and other beneficial insects a refuge from exposure to potentially harmful pesticides. Pesticides applied to crops can move into nearby habitat areas via spray drift or volatilization, leaching, runoff, or wind erosion, causing harm to the pollinators and other beneficial insects using those areas for food and shelter.

Although growers can take many steps to help mitigate spray drift, including calibrating equipment to larger spray droplet sizes and only applying during optimal weather conditions, there is always a risk of off-site movement even with the best equipment under optimal weather conditions. This is especially true when applying persistent systemic, water-soluble chemicals like neonicotinoid insecticides, which move off-site easily via drift, leaching, and the dust created during the mechanical planting of treated seeds. Neonicotinoids have been found to be taken up by wildflowers in nearby habitat areas, causing harm to bees and other beneficial insects visiting contaminated wild plants for pollen and nectar (Pecenka and Lundgren 2015, Mogren and Lundgren 2016).

Spatial buffers should meet the following minimum width: 40 feet for ground-based applications, except airblast; 60 feet for airblast applications; 125 feet for seed treated with nitroguanidine neonicotinoids. (Graphc: Justin Wheeler, Xerces Society)

To help safeguard permanent habitat areas from pesticide contamination, Bee Better requires growers to establish pollinator habitat away from areas treated with pesticides, leaving an unsprayed spatial buffer between treated crops and permanent habitat. If there isn't enough room on the farm for an adequate spatial buffer (see buffer sizes in the "Relevant Bee Better standards" section below), Bee Better requires growers to plant a dense vegetative drift barrier consisting of non-attractive evergreen species to protect permanent pollinator habitat from pesticide drift and runoff. Spatial or vegetative buffers are also required between new pollinator habitat and neighboring land where insecticides are known or suspected to be applied (for example, conventional canola, corn, cotton, soy, sunflower, or wheat fields).

It is critical to note that Bee Better's required spatial buffer distances, or setbacks, around pollinator habitat are dependent on the many steps Bee Better growers are already taking to reduce the risk of pesticides to pollinators. The Bee Better standards encourage adoption of preventive, non-chemical approaches to pest management, and restrict the most high-risk pesticide uses. If growers were not taking these steps to minimize harmful pesticide use, these buffer distances would likely not be enough to protect habitat from contamination.

Within permanent habitat areas and buffer zones, Bee Better prohibits most pesticide use to protect the pollinators and other beneficial insects living in or visiting those areas. However, some targeted uses for herbicides are allowed, as herbicides can be an effective and economical tool for habitat management. Herbicides cannot be applied to blooming plants, including weeds, in these areas. In addition, the use of paraquat dichloride, an herbicide found to have direct negative effects on bee larvae (Cousins et al. 2013), is prohibited in habitat and buffer areas.

Relevant Bee Better standards

Establish a pesticide-free buffer around permanent pollinator habitat (Standard 2.3c). Spatial buffers should meet the following minimum width: 40 feet for ground-based applications, except airblast; 60 feet for airblast applications; 125 feet for seed treated with nitroguanidine neonicotinoids.

Vegetative buffers (drift fences) of species that are not attractive to pollinators may be used instead of spatial buffers, if spatial buffer distances cannot meet the above requirements. Vegetative buffers should be comprised of densely planted, small-needled evergreen species that achieve at least 60% porosity. Airflow must be maintained within vegetative buffers. Vegetative buffers should be designed to grow above spray release height. Until the buffer is above spray release height any pesticide applications on your property must be in accordance with the drift and runoff precautions on the label in order to minimize potential for movement into permanent pollinator habitat.

Buffers are required within your own property, as well as between new permanent pollinator habitat on your property and neighboring farms or land where insecticides are known or suspected to be applied. When insecticide application practices on neighboring properties change following permanent habitat creation on your parcels, spatial buffer requirements can be waived, although when feasible, we recommend incorporating a vegetative buffer. When permanent habitat is adjacent to farms containing canola, corn, cotton, soy, sunflower, and wheat, seed treatment buffers must be adhered to unless there is proof that neighboring farms are not treated with nitroguanidine neonicotinoids (e.g., they are certified organic).

Herbicides (except paraquat dichloride) may be applied within buffers.

For more information, see the following resources:

A. Code, H. Sardinas, T. Heidel-Baker, J. Kay Cruz, S.H. Black, E. Mader, M. Vaughan, & J. Hopwood. 2016. Guidance to Protect Habitat from Pesticide Contamination. The Xerces Society for Invertebrate Conservation. http://www.xerces.org/wp-content/uploads/2016/10/ProtectingHabitatFromPesticideContamination_oct2016-02.pdf

Hopwood, J., A. Code, M. Vaughan, D. Biddinger, M. Shepherd, S.H. Black, E. Mader, & C. Mazzacano. 2016. How Neonicotinoids Can Kill Bees. 2nd ed. The Xerces Society for Invertebrate Conservation. https://xerces.org/neonicotinoids-and-bees/

Hofman, V. & E. Solseng. 2017. Reducing Spray Drift. North Dakota State University, AE-1210. https://www.ag.ndsu.edu/publications/crops/reducing-spray-drift

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Blog **Bee Better Certified: An Evolving Standard**

After a year and a half of Bee Better Certified, we have analyzed how the standards work for the many operations that are already implementing them, and have adjusted our requirements accordingly.

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