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# SAN PESTICIDE MANAGEMENT REQUIREMENTS

for the 2017 Sustainable Agriculture Standard



Sustainable Agriculture Network

# Contents

<b>Introduction</b>	<b>3</b>
<b>SAN Integrated Pest Management</b>	<b>4</b>
<b>Safeguards for all pesticides used on certified farms</b>	<b>5</b>
<b>A hazard approach based on WHO/FAO parameters</b>	<b>6</b>
<b>Three neonicotinoids and fipronil</b>	<b>7</b>
<b>Risk mitigation requirements based on a scientific approach</b>	<b>8</b>
<b>SAN Procedure for Exceptional Pesticide Use</b>	<b>9</b>

## Introduction

The new SAN pesticide management requirements of the 2017 SAN Sustainable Agriculture Standard are based on a stronger integrated pest management (IPM) approach and the regulation of 320 pesticide active ingredients. This regulation includes the prohibition of 125 pesticides covered by the WHO/FAO framework of Highly Hazardous Pesticides, the prohibition of 25 obsolete substances and specific risk management requirements for an additional set of 170 active ingredients.

The standard ensures pesticide risk reduction through several significant changes that raise the bar for certification in health, environmental protection and sustainable crop and cattle production. The amount of pesticide applied by certified farms is expected to go down as a result of rigorous implementation of new IPM criteria, backed up by training for auditors, and opportunities for better technical support. The most egregious health and environmental risks will be eliminated by adoption of an extended version of the WHO/FAO Highly Hazardous Pesticide classification to define SAN prohibited substances. And for the first time, a state-of-the-science risk assessment process connects individual pesticides to risk mitigation practices for the protection of human bystanders, pollinators, vertebrate wildlife and aquatic life.

The standard's criteria reassign the role of pesticides in certified production systems to tactic of last resort in IPM programs, and it clearly identifies the risks associated with many, widely-used compounds. It respects the imperative for economic production of high yield and high quality crops on certified farms, but it also provides opportunities for risk reduction through learning and adaptation by clearly identifying where mitigation is required.

The system that the SAN is proposing is a product of six years of work in West Africa and the USA, which included extensive analysis of the uncertainties associated with the marketplace, and crop production practices in the developing world, representing the most detailed and comprehensive analysis ever undertaken. The SAN pesticide criteria are intended to protect farmers, workers and wildlife in places where there has been little capacity to reduce pesticide risks in the past.

Farmers and workers of farms producing SAN/RA certified crops usually spend much longer in the field and are in much more intimate contact with plant surfaces than most of their Northern counterparts. They tend to have lower body weight, and less access to health care. The pesticide marketplace is often dominated by broad spectrum, highly toxic pesticides. The probability of a toxic exposure is higher in the commodities SAN members work in, with a greatly reduced safety margin compared with Northern agriculture. The 2017 SAN Sustainable Agriculture Standard is the first to address these problems explicitly, backed up by evidence that risks are reduced when the proposed systems are adopted.

## SAN Integrated Pest Management

According to the SAN IPM concept, pesticides may only be used if their use is justified within the integrated pest management plan. This plan includes actions for:

- Non-chemical pest prevention.
- Avoidance of pest-susceptible crops.
- Monitoring of pests to identify their presence during periods of crop susceptibility.
- Assess trends and risks associated with climate change.
- Determination of pest management steps like cultural practices that suppress pest growth, physical practices that damage or remove pests, biological practices that increase pest mortality from predators, parasites or pathogens.
- Use of non-restricted low toxicity pesticides.

Implementation of an IPM plan enhances farm management, at least in the following areas:

- **Reduced use of pesticides:** Through preventive and pest monitoring measures; use of cultural techniques for their control; provision of habitat for biological control agents, use of substances with low toxicity; and the use of pesticides, in general, as a last resort.
- **Elimination of serious risks to human and environmental health:** By prohibiting the use of active ingredients classified as highly hazardous by the World Health Organization WHO and the United National Food and Agriculture Organization **FAO**, that cover several international conventions regarding pesticides.
- **Reduced risks to human health, associated with the application of restricted use pesticides:** Mechanisms are established for mitigation, including: the use of personal protective equipment; strict pesticide application measures according to the setting and type of active substances; parameters for restricting application in areas near human activities; restricted entry intervals for application areas; training on the correct use of equipment and pesticides; job safety plan for pesticide use.
- **Reduced risk of effects on pollinators, vertebrate fauna and aquatic organisms:** A relationship has been detected between restricted use substances and their potential effects on the environment; this requires the mandatory implementation of mitigation measures for that risk. These include parameters for aerial fumigation, non-application zones, vegetative barriers, and the protection of pollinators and natural water bodies.

## Safeguards for all pesticides used on certified farms

The 2017 SAN Standard rules the use of permitted pesticides by general risk management criteria, including:

- Only pesticides that are legally registered and not prohibited by SAN are used (Critical Criterion).
- Safe storage of pesticides (Critical Criterion).
- Use of Personal Protective Equipment by pesticide handlers (Critical Criterion).
- Training on pesticide related risks and their mitigation for all pesticide handlers (Critical Criterion).
- All pesticide handlers use bathing facilities after applications and before leaving the farm (Critical Criterion).
- Compliance of SAN requirements for aerial fumigation, including not presence of workers in areas during aerial fumigation with pesticides. In the case of primary and secondary drainage canals with permanent water, a plan is developed and implemented to cover these water bodies with vegetation or other effective physical means (Critical Criterion).
- Implementation of Restricted Entry Intervals for workers entering pesticide applied areas without PPE.
- Cholinesterase levels tests for workers that handle organophosphate or carbamate pesticides, before the application season.
- Potentially affected persons or communities are identified, alerted, and warned in advance about pesticide applications and prevented from access to pesticide application areas.
- Selection of optimum agrochemical application equipment and techniques for the crop, agrochemical type and weather conditions in order to reduce spray drift.
- Establishment and maintenance of non-crop vegetative barriers and SAN non-application zones between pesticide applied crops and areas of human activity, as well as natural ecosystems.

## A hazard approach based on WHO/FAO parameters

The 2017 SAN List of Prohibited Pesticides responds to the FAO/WHO Panel of Experts on Pesticide Management (JMPM) 2008 recommendation for the classification of Highly Hazardous Pesticides and covers 125 active ingredients:

- Pesticide active ingredients that meet the criteria of classes Ia (extremely hazardous) or Ib (highly hazardous) of the WHO Recommended Classification of Pesticides by Hazard.
- Pesticide active ingredients that meet the criteria of carcinogenicity Categories 1A and 1B of the Globally Harmonized System on Classification and Labelling of Chemicals (GHS).
- Pesticide active ingredients that meet the criteria of mutagenicity Categories 1A and 1B of the Globally Harmonized System on Classification and Labelling of Chemicals (GHS).
- Pesticide active ingredients that meet the criteria of reproductive toxicity Categories 1A and 1B of the Globally Harmonized System on Classification and Labelling of Chemicals.
- Pesticide active ingredients listed by the Stockholm Convention in its Annexes A and B, and those meeting all the criteria in paragraph 1 of Annex D of the Convention.
- Pesticide active ingredients listed by the Rotterdam Convention in its Annex III.
- Pesticides listed under the Montreal Protocol.
- Pesticide active ingredients and formulations that have shown a high incidence of severe or irreversible adverse effects on human health or the environment (indicated in the Severe Effects column): SAN has interpreted this WHO/FAO parameter with the reclassification of the current SAN prohibition of paraquat dichloride, as scientific evidence has revealed that this substance poses severe risks to human health. Atrazine has also been included in this list because of scientific evidence of water contamination. Additionally, the three neonicotinoids clothianodin, imidacloprid and thiamethoxam and the phenylpyrazole fipronil have been incorporated in the SAN Prohibited Pesticide List, because they significantly affect bee populations, other pollinators and birds, can persist for years in soils, and can leach into waterways and groundwater, where they have depleted insect abundance and diversity. SAN also included the three active ingredients aluminum phosphide, magnesium phosphide and phosphine in the list, as their use as a fumigant to control rodent populations in storage facilities can lead to death by inhalation.

The List of Prohibited Pesticides also includes a set of 25 active ingredients considered as obsolete<sup>1</sup> substances.

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<sup>1</sup> Obsolete pesticides are pesticides that are unfit for further use or for re-conditioning. Obsolescence may arise because a product has been de-registered locally or banned internationally. (IUPAC International Union of Pure and Applied Chemistry)

## Three neonicotinoids and fipronil

Based on scientific evidence, SAN is establishing a prohibition of the three neonicotinoids clothianodin, imidacloprid and thiamethoxam and the phenylpyrazole fipronil. The use of these four substances is subject to a special exception procedure which will cease to exist by June 30, 2020.

These substances significantly affect bee populations, as well as other pollinators and birds. The **Worldwide Integrated Assessment of the Impact of Systemic Pesticides on Biodiversity and Ecosystems (WIA)**, reviewed the impacts of the neonicotinoid family, and an additional insecticide, fipronil that shares many of the characteristics of neonicotinoids. The WIA contains an editorial and seven, individually peer-reviewed scientific papers, and was based on a review of over 800 peer-reviewed journal articles published over the last two decades. Its findings and conclusions are summarized here:

- Neonicotinoids are found in nectar and pollen of treated crops and have also been detected at much higher concentrations in guttation drops exuded by many crops.
- Neonicotinoids can persist for years in soils so environmental concentrations may build up with repeated use with possible impact on soil invertebrates.
- Neonicotinoids can leach into waterways and groundwater. In regions of high neonicotinoid use, such as the USA and the Netherlands, concentrations high enough to kill insects are frequently recorded in surface waters in arable areas. Waterways with higher neonicotinoid concentrations have depleted insect abundance and diversity.
- Dust created during drilling of treated seeds is lethal to flying insects, and has caused large-scale losses of honeybee colonies.
- When applied as foliar sprays, drift is likely to be highly toxic to non-target insects.
- Wild plants growing near crops can become contaminated with neonicotinoids (via dust, spray or water), with potential impacts on a broad range of invertebrates living on farms.
- For bees, consuming contaminated pollen and nectar leads to impaired learning and navigation, raised mortality, increased susceptibility to disease and reduced fecundity. In bumblebees there is clear evidence for colony-level effects.
- Seed-feeding birds may only need to eat a few treated seeds to receive a lethal dose. Lower doses lead to lethargy, reduced fecundity and impaired immune function.

## Risk mitigation requirements based on a scientific approach

The SAN List of Pesticides for Use with Risk Mitigation includes 170 pesticides that can only be used, if specific risk mitigation criteria are applied by farms. There are four risk categories based on the Oregon State University Integrated Plant Protection Centers' state-of-the-science risk assessment tool ipmPRiME, and a risk model that identifies moderate to high (10% or greater) risk.

The following table summarizes the four risk categories and their associated risk mitigation criteria:

Risk category	Risk mitigation
<b>Risk to aquatic life</b>	Protection of aquatic ecosystems -habitat of fish and crustaceans- via the no application at adjacent zones or the establishment of functional vegetative barriers.
<b>Risk to wildlife</b>	Protection of terrestrial ecosystems -source habitat of birds and mammals- via the no application at adjacent zones or the establishment of functional vegetative barriers.
<b>Risk to pollinators</b>	Exposure to natural ecosystems -source habitat of pollinators- is minimized via the no application at adjacent zones or the establishment of functional vegetative barriers. Contact of pollinators with pesticides is reduced through spraying when pollinators are not active or no spraying when crops are flowering and no exposure of flowering weeds to these pesticides.
<b>Inhalation risk for workers or bystanders</b>	Pesticide handlers can only use this substance, if all application sites are flagged to indicate inhalation risks to bystanders, restricted entry intervals are enforced and pesticide handlers are protected by respirators with an organic vapor (OV) cartridge or canister with any N, R, P, or 100 series pre-filter.

## SAN Procedure for Exceptional Pesticide Use

Based on SAN public consultation results, SAN developed a Procedure for Exceptional Pesticide Use which grants justified and exceptional use for at least 27 of 125 substances included in the SAN List of Prohibited Pesticides. The exceptions will be authorized based on the control of specific pest species and will apply uniformly at country-level and for specific crops or cattle production systems. These 27 substances belong to the following pesticide types.

Type	Risk mitigation
<b>Nematicides</b>	<ul style="list-style-type: none"> <li>• Application methods place the product precisely within the plant root zone or use tree injection. Uncovered application of granules is prohibited in SAN non-application zones.</li> <li>• Daily maximum application time is limited to six hours and application is conducted during the coolest hours of the day.</li> <li>• Annual medical monitoring of applicator health (kidney and liver function) is provided.</li> <li>• Cholinesterase levels of workers are tested, if they use the organophosphates ethoprop or terbufos or the carbamate oxamyl.</li> </ul>
<b>Rodenticides</b>	<ul style="list-style-type: none"> <li>• Rodenticide traps are only used, if rodent monitoring demonstrates that mechanic control methods are not effective.</li> <li>• Only formulated rodenticides baited traps classified as moderately toxic (blue label) or slightly toxic (green label) are used.</li> <li>• Signs of rodent activity (droppings, tracks, gnaw marks, burrows) are monitored and the results recorded.</li> <li>• Food sources attracting rodents and debris are eliminated.</li> <li>• Bait stations are removed and the amount of stations diminished when there are no longer signs of rodent feeding or there is evidence of use by non-target wildlife.</li> </ul>
<b>Three neonicotinoids and fipronil</b>	<ul style="list-style-type: none"> <li>• <b>The exception period for these substances ends by June 30, 2020.</b></li> <li>• Exposure to natural ecosystems – source habitats of pollinators - is minimized via the no application at adjacent zones or the establishment of functional vegetative barriers.</li> <li>• Contact of pollinators with substances is reduced through spraying when pollinators are not active or no spraying when crops are flowering and no exposure of flowering weeds to these pesticides.</li> </ul>
<b>Reproductive Toxicity</b>	<ul style="list-style-type: none"> <li>• Women of reproductive age (15 – 50 years) do not apply GHS repro 1A/1B pesticides.</li> <li>• Restricted Entry Intervals (REI) are fully enforced.</li> <li>• Pesticide handlers receive medical exams.</li> <li>• Potentially affected persons or communities are identified, alerted, and warned in advance about pesticide applications and prevented from access to pesticide application areas.</li> <li>• Farms establish and maintain non-crop vegetative barriers compliant with SAN parameters for vegetative barriers or SAN non-application zones between pesticides applied crops and areas of human activity.</li> </ul>

The exceptional use of these and other specific substances is authorized, if:

- Evidence is provided that other less toxic but effective pesticides to control this pest species (not prohibited by the SAN Prohibited Pesticide List) are not registered in the specific country; and
- Specific SAN risk management requirements are fully complied with.

If farms or group administrators use these authorized substances, but do not comply with or only partially comply with specific SAN risk management requirements, this fact will be considered as a non-conformity against critical criterion 3.4 of the SAN 2017 Sustainable Agriculture Standard.