***Insert Company Name***

**Integrated Pest Management Plan**

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| ***General Instructions***   1. *Insert company logo in the header* 2. *Insert company name where indicated (“[insert company name]”)* 3. *Consider the guidance / follow the instructions given in the instruction boxes* 4. *Delete the instruction boxes throughout when the document is completed, including this box.* |

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| **Type of Document:** | Procedure |

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**Amendments**

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| *Instruction Box – Delete when complete.*  General Instructions for Customisation and Compliance |
| This document provides a template, with instructions, for the preparation of an Integrated Pest Management Plan for your operation. The Integrated Pest Management Plan, when complete, will describe the steps to be taken for managing pest populations in a manner that is environmentally sustainable, economically viable, and safe for humans and non-target organisms.  The Integrated Pest Management Plan shall be designed to ensure that pest management is conducted in accordance with local laws and regulations and international standards, such as the International Finance Corporations (IFC) Performance Standards (PS) (2012), specifically PS3 and PS6.  Performance Standard 3 addresses Integrated Pest Management within its broader guidelines on resource efficiency and pollution prevention. Notably, Section 14 sets forth expectations for managing pest infestations and disease vectors that pose risks to public health. PS3 also emphasizes minimizing the use of hazardous pesticides by promoting safer alternatives and integrated approaches to pest control. Performance Standard 6 focuses on Biodiversity Conservation and the Sustainable Management of Living Natural Resources, incorporating key considerations for IPM. According to PS6, companies are required to maintain thorough documentation and reporting systems to monitor pest management activities.  The Integrated Pest Management Plan should outline the monitoring and evaluation process, including the effectiveness of pest control measures, compliance with regulations, and any adjustments needed to maintain biodiversity and mitigate risks to ecosystems and human health.  An Integrated Pest Management Plan aligned with PS3 and PS6, should focus on:   * Minimizing pesticide use and prioritizing non-chemical control methods. * Protecting biodiversity and ecosystems through environmentally responsible pest control. * Assessing risks to human health, local communities, and ecosystems. * Ensuring safe use of lowest hazard chemicals if absolutely necessary, while safeguarding workers and surrounding populations. * Engaging local communities and stakeholders to incorporate their knowledge and address concerns. * Ongoing monitoring and evaluation of pest management activities for effectiveness and compliance.   Below is a list of useful resources to consider when drafting your Integrated Pest Management Plan:   * [IFC Performance Standards on E&S Sustainability (2012)](https://www.ifc.org/content/dam/ifc/doc/2010/2012-ifc-performance-standards-en.pdf) * [IFC General Environmental, Health and Safety (EHS) Guidelines (2007)](https://www.ifc.org/content/dam/ifc/doc/2000/2007-general-ehs-guidelines-en.pdf) * [IFC EHS Guidelines for Annual Crop Production (2016)](https://www.ifc.org/content/dam/ifc/doc/mgrt/annual-crop-production-ehs-guidelines-2016-final.pdf) * [IFC EHS Guidelines for Food and Beverage Processing (2016)](https://www.ifc.org/content/dam/ifc/doc/2010/2016-annual-crop-production-ehs-guidelines-en.pdf) * [IFC EHS Guidelines for Perennial Crop Production (2015)](https://www.ifc.org/content/dam/ifc/doc/mgrt/final-perennial-crop-production-november-2015.pdf) * [IFC ESMS Toolkit and Case Studies – Crop Production](https://documents1.worldbank.org/curated/en/414331491570397072/pdf/114083-WP-IFC-ESMS-Toolkit-Crop-Production-PUBLIC.pdf) * [BII Sector Profiles](https://toolkit.bii.co.uk/sector-profiles/) including [Agriculture and Aquaculture](https://toolkit.bii.co.uk/sector-profiles/agriculture-and-aquaculture/), [Food and Beverages](https://toolkit.bii.co.uk/sector-profiles/food-and-beverages/) and [Forestry and Plantations](https://toolkit.bii.co.uk/sector-profiles/forestry-and-plantations/) * [Pesticide Action Network International](https://pan-international.org/) * [FAO – Integrated Pest Management](https://www.fao.org/agriculture/crops/core-themes/theme/pests/ipm) * [FAO – Pest and Pesticide Management (Guidance / Standards)](https://www.fao.org/pest-and-pesticide-management/guidelines-standards/en/) * [FAO and WHO – Managing Pesticides in Agriculture and Public Health](https://openknowledge.fao.org/server/api/core/bitstreams/a9191456-07cb-4a79-9dce-50472e31b694/content) * [Economic Thresholds of Insect Pests](https://www.saskatchewan.ca/business/agriculture-natural-resources-and-industry/agribusiness-farmers-and-ranchers/crops-and-irrigation/insects/economic-thresholds-of-insect-pests) * Examples of [Economic Thresholds of Insect Pests](https://pubsaskdev.blob.core.windows.net/pubsask-prod/142458/EconomicThresholds.pdf) * [Economic Thresholds for Insects Attacking Oilseeds](https://open.alberta.ca/dataset/924bbfe2-72ed-45de-94dc-99cfc90ed449/resource/12054aa1-8d4b-49c7-9a6d-746c42f01551/download/2014-140-620-1.pdf) * [Alternatives to Highly Hazardous Pesticides](https://saicmknowledge.org/sites/default/files/meterial/A%20short%20guide%20to%20alternatives%20to%20HHPs.pdf) * [IPAM – Gateway to Global Agroecology](https://ipam-global.org/) * [Weed management: Alternatives to the use of glyphosate | PAN Europe](https://www.pan-europe.info/resources/reports/2023/03/weed-management-alternatives-use-glyphosate) * [Mapping-IPM-uptake-in-Europe.pdf](https://www.pan-europe.info/sites/pan-europe.info/files/public/resources/press-releases/PR%20with%20LIFE%20logo/Mapping-IPM-uptake-in-Europe.pdf) * [Alternatives - Pesticide Action Network UK](https://www.pan-uk.org/alternatives-to-pesticides/) * [Agroecology - An Alternative to Pesticides - Pesticide Action Network UK](https://www.pan-uk.org/agroecology/) * [Alternatives to Highly Hazardous Pesticides - A short guide - Pesticide Action Network UK](https://www.pan-uk.org/alternatives-to-highly-hazardous-pesticides-a-short-guide/) * [Understanding Pesticide Spray Drift](https://pubsaskdev.blob.core.windows.net/pubsask-prod/144793/Understanding-Pesticide-Spray-Drift-Factsheet.pdf) |

# Purpose and Scope

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| *Instruction Box – Delete when complete*   * *Insert the company name where indicated throughout the document.* * *Describe the purpose of the management plan. It should describe why the management plan is required and any requirements it is aligned to (e.g. compliance with other internal procedures and guidelines, alignment with international standards and guidelines, e.g. International Finance Corporation (IFC) Performance Standards (PS) on Environmental and Social Sustainability (2012)).* * *Define the scope of application of the management plan and whom it applies to. The scope of application of an Integrated Pest Management Plan is broad and can vary depending on the setting in which it is implemented.* * *The section below is generic. Review and modify as required for your company.* |

The purpose of an Integrated Pest Management (IPM) Plan is to provide a comprehensive, sustainable approach to pest control that minimizes the use of chemical pesticides, reduces risks to human health and the environment, and ensures the long-term effectiveness of pest management strategies. Specifically, the core aim is to:

* Reduce Pest Populations: Address pest problems effectively and efficiently while minimizing their impact on crops, structures, health, and the environment.
* Minimize Pesticide Use: Reduce dependency on chemical pesticides by using alternative, less harmful pest control methods.
* Ensure Sustainable Practices: Use environmentally friendly, socially responsible, and economically viable techniques to manage pests, supporting ecological balance and reducing the environmental footprint.

This Integrated Pest Management Plan describes technical, operational, and organisational measures which may prevent or reduce the damaging effects of pesticides. The IPM Plan applies to a variety of stakeholders, including operations managers and farm workers, health and safety officers and procurement and supply chain managers.

# Objectives

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| *Instruction Box – Delete when complete*   * *State the objectives of the management plan and what it aims to achieve.* * *You may wish to relate the objectives of the IPM Plan to your company strategy on achieving E&S goals.* * *The section below is generic. Review and modify as required for your company.* |

The objective of the Integrated Pest Management Plan is to provide guidance on the sustainable management of insects, fungi or plant diseases; to reduce the use of chemical pesticides where possible; and to mitigate negative impacts of pesticide use.

The main objectives are:

* **Prevention**: Prevent pest problems before they occur by altering the environment, reducing habitat availability for pests, and using preventative cultural practices.
* **Early Detection**: Identify pest issues early through regular monitoring, so interventions can be made before pest populations become unmanageable.
* **Cost-Effectiveness**: Minimize the economic damage caused by pests, while also avoiding unnecessary expenditures on control methods (e.g., excessive pesticide use).
* **Environmental Protection**: Use non-chemical methods wherever possible to protect ecosystems, reduce the risk of pesticide resistance, and avoid harm to beneficial species (e.g., pollinators, predators).
* **Public Health and Safety**: Ensure that pest control methods are safe for humans, animals, and the broader environment.
* **Sustainability**: Promote long-term, sustainable pest management that reduces environmental impact, improves pest resistance, and ensures a balance between pest control and ecological health.

# Legal and International Requirements

## National Laws and Regulations

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| *Instruction Box – Delete when complete*   * *Review country and local legislation relating to the topic and incorporate as may be required into this section.* * *List all relevant topic-related laws and regulations below.* |

This IPM Plan has been developed to conform to the following national laws and regulations:

* *[Example of the types of names for such laws and regulations, include:*
  + *National Environmental Management Act; and*
  + *Agricultural Pests Act]*

## International Standards and Guidelines

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| *Instruction Box – Delete when complete*   * *List all relevant international standards, guidelines and delete any below that are not applicable.* * *The section below is generic. Review and modify as required for your company.* |

The IPM Plan has been developed to conform to the following international standards and guidelines:

* International Finance Corporation (IFC) Performance Standards (PS) on environmental and social (E&S) Sustainability (2012). The most salient PS related to integrated pest management are related to:
  + Performance Standard 3 (PS3): Resource Efficiency and Pollution Prevention: Includes pest management guidelines under Section 14, emphasizing control of pest infestations and disease vectors affecting public health.
  + Performance Standard 6 (PS6): Biodiversity Conservation and Sustainable Management of Living Natural Resources: Companies must have adequate documentation and reporting mechanisms in place to track pest management activities. The Integrated Pest Management Plan should outline the monitoring and evaluation process, including the effectiveness of pest control measures, compliance with regulations, and any adjustments needed to maintain biodiversity and mitigate risks to ecosystems and human health.
* IFC General Environmental, Health and Safety (EHS) Guidelines (2007);
* IFC EHS Guidelines for Annual Crop Production (2016);
* IFC EHS Guidelines for Food and Beverage Processing (2016);
* IFC EHS Guidelines for Perennial Crop Production (2015); and
* The World Health Organization (WHO) Recommended Classification of Pesticides by Hazard (2019).

# Other Relevant References

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| *Instruction Box – Delete when complete*   * *List all relevant documents which are referred to in this document and / or which supported the drafting of this document.* * *Modify/delete/add to the list as required.* |

This IPM Plan should be read together with the following documents:

* [insert company name] Hazardous Materials Management Plan; and
* [insert company name] Waste Management Plan.

# Definitions

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| *Instruction Box – Delete when complete*   * *List definitions that need to be defined in order to ensure proper interpretation of the management procedure or management plan.* |

| **Term** | **Definition** |
| --- | --- |
| Companion planting | The practice of growing two or more plant species in close proximity to each other to enhance growth, repel pests, or provide mutual benefits. |
| Integrated pest management | A mix of farmer-driven, ecologically based pest control practices that seeks to reduce reliance on synthetic chemical pesticides. It involves: (a) managing pests (keeping them below economically damaging levels) rather than seeking to eradicate them; (b) relying, to the extent possible, on non-chemical measures to keep pest populations low; and (c) selecting and applying pesticides, when they have to be used, in a way that minimizes adverse effects on beneficial organisms, humans, and the environment. |
| Low-toxicity pesticide | A low-toxicity pesticide refers to a chemical or biological agent used to control pests that has relatively low harmful effects on humans, animals, and the environment. These pesticides are often derived from natural or less harmful chemical sources and are characterized by a lower potential for acute (immediate) and chronic (long term) toxicity, often indicated by the "CAUTION" signal word on the label. |
| Mechanical weeders | Tools or machines designed to physically remove or control weeds without the use of chemicals. These devices can be manual (e.g., hand tools like hoes or weed-pullers) or powered (e.g., tractor-mounted or robotic machines). |
| Mulching | The practice of applying a layer of material (organic or inorganic) to the soil surface around plants. The primary purposes of mulching are to retain soil moisture, suppress weed growth, regulate soil temperature, and improve soil fertility through decomposition of organic materials. |
| Pesticide | A substance used for destroying insects or other organisms (e.g. fungi, disease, weeds) harmful to cultivated plants or to animals. Includes fungicides, herbicides, etc. |
| Spray drift | Spray drift refers to the unintentional movement of pesticide sprays, herbicides, or other chemical agents away from the target area, typically due to wind, air currents, or improper application techniques. |

# Abbreviations and Acronyms

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| *Instruction Box – Delete when complete*   * *List abbreviations and acronyms which are referred to in the document.* |

| **Abbreviations and Acronyms** | **Definition** |
| --- | --- |
| EHS | Environmental, Health and Safety |
| ESMS | Environmental and Social Management System |
| IFC | International Finance Corporation |
| IPM | Integrated Pest Management |
| PS | Performance Standard |
| PPE | Personal Protective Equipment |
| WHO | World Health Organization |

# Integrated Pest Management

Integrated Pest Management is the application of all available management practices and control measures to control pests and diseases whilst reducing chemical control as far as possible or applying it more cautiously.

## Preventative Measures

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| *Instruction Box – Delete when complete*   * *Describe preventative measures implemented to promote optimal crop health and prevent pest and disease infestations from occurring.* * *Specify what the company will do and how and when it will do it to implement the preventative measures.* * *The section below is generic. Review and modify as required for your company.* |

Non-chemical measures to prevent pest and disease infestations from occurring shall be implemented. For example:

* **Crop Rotation**: Rotating crops annually or seasonally helps prevent the buildup of pest populations and soil-borne diseases. Different crops attract different pests, and rotating them reduces the chances of pests and pathogens becoming established in the soil. For example, alternating between legumes and cereal crops can break pest cycles and improve soil health.
* **Weed Management**: Weeds can serve as hosts for pests and diseases, so effective weed management is essential. Regularly removing weeds through manual labor, mowing, or herbicide use (as part of a targeted IPM approach) helps reduce the pest habitat and food sources.
* **Companion Planting**: Planting specific companion plants that repel pests or attract natural predators can help reduce pest pressure. For example, planting marigolds can deter nematodes, while garlic can repel aphids.
* **Mulching**: Applying mulch around plants can help regulate soil temperature, reduce weed growth, and conserve moisture. Organic mulch also adds nutrients to the soil and can discourage certain pests, like root-feeding insects.
* **Physical Barriers**: Using netting or row covers can prevent pest insects (like aphids or caterpillars) from reaching the plants. These barriers provide an effective physical deterrent against pests, especially in the early stages of crop development.
* **Soil Aeration and Drainage**: Well-aerated, well-drained soils reduce the risk of diseases, such as root rot, that thrive in waterlogged conditions. Proper irrigation practices should be employed to prevent standing water.
* **Fungal Inoculants**: Products designed to promote plant growth and health by introducing beneficial fungi into the soil. Example *Trichoderma asperellum* strengthens disease control and tolerance to common soil diseases including *Fusarium, Rhizoctonia, Pythium and Phytophthora.*
* **Host-Resistance and Crop Breeding (e.g. choice of crop variety)**: use of improved varieties with better pest-resistance traits.
* **Proper Planting Techniques**: Correct spacing between plants ensures good air circulation, reducing humidity levels that encourage the spread of fungal diseases. In addition, planting crops at the right time of year and ensuring they are well-suited to the local environment can reduce stress and susceptibility to pests.
* **Trap Cropping**: Growing plants that attract pests away from the main crop (known as trap crops) can reduce the likelihood of pests attacking the primary crop. For example, planting mustard or radishes can attract root-feeding nematodes, keeping them away from the main crops.

The following shall be implemented:

* **Crop Rotation**: The Agronomy Team will develop and maintain a crop rotation schedule annually. Crop rotations will be implemented each planting season to disrupt pest and disease cycles. Compliance will be monitored during field inspections.
* **Weed Management**: Field workers will perform manual weeding and mowing every 3-4 weeks during the growing season. Herbicides will only be applied selectively and under supervision by the Agronomy Team, with all uses documented in the pesticide log.
* **Companion Planting**: The Field Operations Team will plant companion species such as marigolds and garlic alongside main crops at the start of each season to naturally deter pests. Success will be evaluated through pest monitoring data.
* **Mulching**: Organic mulch will be applied around young plants immediately after planting by the Field Supervisors. This will be reviewed periodically to ensure adequate coverage and effectiveness.
* **Physical Barriers**: The Maintenance Team will install and maintain insect netting or row covers on vulnerable crops during early growth stages. Barriers will be inspected monthly for damage or pest intrusion.
* **Soil Aeration and Drainage**: The Soil Management Unit will perform soil aeration and ensure proper drainage annually before planting. Irrigation systems will be checked regularly to prevent waterlogging.
* **Fungal Inoculants**: The Field Operations Team will apply beneficial fungal inoculants such as *Trichoderma asperellum* at the seedling stage each season. The impact on disease incidence will be tracked and recorded.
* **Host Resistance and Crop Breeding**: The Agronomy Team will select and procure pest-resistant crop varieties each year. Variety performance will be reviewed post-harvest based on pest pressure and yield data.
* **Proper Planting Techniques**: Training sessions on optimal plant spacing, planting timing, and local adaptation will be conducted for field staff prior to each planting season. Training effectiveness will be assessed through periodic field audits.
* **Trap Cropping**: The Agronomy Team will coordinate planting of trap crops such as mustard or radishes annually around main fields. Trap crop health and pest attraction will be monitored monthly.

## Pest and Disease Monitoring

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| *Instruction Box – Delete when complete*   * *Describe pest and disease monitoring procedures to determine when pest and disease infestations are occurring and when reactive measures need to be taken.* * *Include the monitoring frequencies, i.e. monthly, quarterly or annual monitoring requirements in line with any statutory requirements and / or permit or licensing requirements.* * *The section below is generic. Review and modify as required for your company.* |

Pest and disease monitoring is essential to ensure that infestations are detected early on and appropriate response measures are implemented before the problem becomes severe. Monitoring helps establish infestation thresholds, which guide the decision on when and how to intervene.

Pest populations and crop health shall be monitored weekly throughout the growing season by designated IPM team members and quarterly reviews to assess the effectiveness of pest control measures and recommend necessary adjustments.

All pest management activities, observations, and outcomes will be carefully documented in the IPM logbook.

### Determining Infestation Thresholds

Infestation thresholds are pre-determined pest population levels that, when exceeded, indicate that intervention measures are needed. These thresholds can be based on:

* **Economic Injury Level**: Determine the point where the cost of pest control outweighs the potential crop damage, serving as the threshold for intervention.
* **Action Threshold**: Establish a threshold level for pest or disease populations at which control measures are necessary to prevent economic damage.

Maintain records of pest and disease observations, including pest counts, signs of infestation, and action taken. Analyze monitoring data to identify patterns and trends in pest and disease outbreaks, helping refine thresholds.

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| *Instruction Box – Delete when complete*   * *Specify the Infestation Thresholds for the anticipated pests of your operations. This may be set by agricultural ministry in your country.* * *The text below is an example, modify as required. For more examples, refer to: Examples of* [*Economic Thresholds of Insect Pests*](https://pubsaskdev.blob.core.windows.net/pubsask-prod/142458/EconomicThresholds.pdf)*.* |

**Table 7.1: Economic Threshold of Insect Pests**

| **Crop** | **Insect** | **Economic Threshold** |
| --- | --- | --- |
| **Canola** | Flea beetles | * 25% of the cotyledon surface is destroyed and flea beetles still present. If damage is only along field margins, and beetles are still congregated there, then control measures should be applied to the damaged areas only. |
| Grasshoppers | * 10-14/m² if damage is being caused. |
| Cutworms | * Threshold of a 25-30% stand reduction. It is economical to just treat infested patches, and not whole fields. |
| Diamondback moth | * Threshold of 100-150 larvae/m² in immature to flowering plants, based on 150-200 plants/m² 200-300 larvae/m² in plants with flowers/pods, based on 150-200 plants/m² |
| Cabbage seedpod weevil | * 25 to 40 weevils per 10 sweeps. |
| Aphids | * Control may be justified when at least 10-20% of the stems are infested with a cluster of aphids in flowering to early pod stages or 25 aphids/10 cm shoot tip after flowering. |
| Lygus bug | * A threshold of 20-30 Lygus bugs per 10 sweeps is suitable for good growing conditions. Using the lower end of the threshold (about 20 per 10 sweeps) may be appropriate for stressed canola with less ability to compensate for feeding. When most pods become leathery and when seeds inside are firm, lygus bugs can no longer penetrate the pods or seeds with their mouth parts and are no longer an economic threat. |
| **Flax** | Aphids | * 3 aphids/main stem at full bloom. 8 aphids/main stem at green boll stage. |
| Cutworms | * 4-5 larvae/m². Sometimes it is most economical to just treat infested patches, and not whole fields |
| Grasshoppers | * 2 grasshoppers/m² (green boll stage) |
| **Wheat** | Wheat midge | * Conventional wheat: approximately 1 adult/4-5 heads for yield; 1 adult/8-10 heads for grade |

### Regular Field Scouting

Field scouting should be conducted regularly (e.g., weekly or bi-weekly) depending on the crop type and season. During scouting, farm workers or pest scouts visually inspect crops for early signs of pest or disease activity. Use tools such as magnifying glasses, sweep nets, and sticky traps to assist with identification and counting of pest populations. Inspect crops for visible symptoms, such as wilting or yellowing leaves (signs of fungal or bacterial infections), presence of pests (e.g., aphids, caterpillars, or mites), webbing or mould growth (fungal infections), etc.

Once the presence of a pest has been confirmed, its identification must be verified. Correct identification may require consulting a reference guide or an agronomist. To facilitate this process, collect samples of the damage and a few specimens of the pest, including as many life stages as possible. The insect and associated damage should be compared with good reference material. If uncertainties remain, contact [insert Agriculture Knowledge Centre contact details if available or other person to contact).

Report any unintended harm to non-target species, beneficial insects, or soil/water contamination. Share monitoring results with all relevant stakeholders (e.g., site managers, staff) for review and action.

Communicate concerns promptly if pest populations exceed acceptable thresholds or if monitoring uncovers health or safety issues.

* The following field scouting methods will be employed [It may be useful to tabulate this indicating season, frequency, number of samples, etc. The section below is generic. Review and modify as required for your company. A useful resource: *https://www.saskatchewan.ca/business/agriculture-natural-resources-and-industry/agribusiness-farmers-and-ranchers/crops-and-irrigation/insects/economic-thresholds-of-insect-pests*]:

If the chart says:

* # adult insects or larvae / m2

Use a metre-stick or pre-measured piece of string to mark off a square metre of the crop. Examine this area, counting the numbers of pests seen. Do this at several randomly chosen and widely-spaced sites. Average your results.

* # adult insects or larvae/sweep

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| *Instruction Box – Delete when complete*   * *Obtain or make a sweep net, a tool used by entomologists to sample insects. It consists of a muslin bag or some similar material held open by a hoop attached to a long handle. An angler's net lined with a pillowcase will work as well.* * *The size of the net opening is important, however, as this will affect the number of insects caught. The standard net size is 38 centimetres (15 inches) in diameter.* |

Using a sweep net, walk through the crop sweeping the net, from side to side, in front of you, through the crop canopy. Generally, the arc of the sweep will cover approximately 180 degrees (half a circle). However, some economic thresholds specify 90 degree sweeps (a quarter circle). The main point is to keep the sweeps consistent. Ideally, the entire open end or mouth of the net should pass through the crop. In some crop stages, such as the pod stage in canola, this can be difficult.

As a general rule, try to keep as much of the net as possible within the crop canopy. Flying insects and those on the plants will be knocked into the bag. Do not sweep through the same pass more than once. Keep track of the number of sweeps and count the number of pests in each sweep, or take an average of the number of insects divided by the number of sweeps.

## Control Measures

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| *Instruction Box – Delete when complete*   * *Describe pest and disease management measures that make use of low-toxicity and non-chemical pesticides, biological controls or other non-chemical products.* * *Provide a description of how measures are taken to only apply chemical crop protection products only when absolutely necessary and how preference is given to low toxicity or non-chemical pesticides.* * *The section below is generic. Review and modify as required for your company.* |

### Selecting Controls

Non-chemical control agents can significantly improve pest and disease management, offering effective and safe alternatives to traditional chemical-based approaches. Below are pest and disease management measures that rely on non-chemical alternative.

* Biological control agents include natural organisms like bacteria, fungi, or viruses, and are used to control pests in a more environmentally friendly way. For example, *Bacillus thuringiensis* is a soil bacterium used to control specific insect larvae, while *Beauveria bassiana* is a fungal biopesticide that targets insects like whiteflies and aphids. Other examples include predators (e.g. Ladybird beetles) and parasitoids (e.g. *Trichogramma* wasps).
* Cultural controls, e.g. pruning diseased material;
* Physical controls, e.g. barriers (insect nets and row covers), traps (sticky and pheromone traps).
* Non-Chemical Pesticides[[1]](#footnote-2)
  + Plant-Based Alternatives: Botanical products such as neem oil, garlic oil, and citronella are used to repel or disrupt pest behavior. These plant-derived compounds often, but not always, have limited toxicity and degrade more quickly in the environment compared to synthetic chemicals.
  + Soap-Based Pesticides: Insecticidal soaps, made from potassium salts of fatty acids, are effective against soft-bodied pests like aphids and mealybugs. These soaps are considered low toxicity and are safe for most beneficial insects when used appropriately.

Non-chemical methods are to be prioritized as far as feasible. When chemical control is required, for example if non-chemical control methods fail, there is a strong preference for using low-toxicity products that pose minimal risk to human health, beneficial organisms, and the environment.

* Use of Low-Toxicity Pesticides
  + Selective Pesticides: Low-toxicity, selective pesticides target specific pests while minimizing harm to non-target organisms like beneficial insects (e.g., bees, ladybugs), soil microbes, and wildlife. For example, using insect growth regulators or biochemical pesticides can disrupt pest life cycles without harming other organisms.
  + Systemic Pesticides with Lower Impact: Systemic pesticides that are absorbed by plants but have lower toxicity profiles are used as an alternative to broad-spectrum insecticides. These pesticides tend to affect only the pests that feed on the treated plants and degrade more quickly in the environment.
  + Organic Pesticides: Products derived from natural sources, such as neem oil, diatomaceous earth, or pyrethrins, are considered low toxicity. These organic pesticides generally have a lower environmental footprint and are generally safer for humans and beneficial organisms.

In general, selective, low-toxicity pesticides are preferred over broad-spectrum or higher toxicity pesticides, regardless of whether they are synthetic/chemical or organic.

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| *Instruction Box – Delete when complete*   * *Specify alternative controls to be used for anticipated pests. It may be beneficial to list this all in a table such as below.* * *The section below is generic. Review and modify as required for your company.* |

**Table 7.1: Example of Alternative Controls for Anticipated Pest**

| **Pest/Disease/Weed** | **Prevention** | **How to scout and when to control** | **Control measures (preferred)** | **Control measures (least preferred)** | **Associated risks** |
| --- | --- | --- | --- | --- | --- |
| Example: Cucumber borer | Plant early in season in April. | Scout about 1-10 plants/acre. There are two generations per year, so expect outbreaks in early in the season in May and then later in July.  Control when borers reach an average of 1 beetle/plant | Release ladybirds at a rate of xx/acre.  [more than one option can be listed] | Pyrethroid insecticide  Use only if infestation is severe  [more than one option can be listed] | Low toxicity but broad-spectrum on insects; kills pollinators- do not use when plant or neighbouring crops are in flower; kills aquatic organisms- do not use near water bodies |
| Squash vine borer | Use pheromone traps in seedling stage | Check traps weekly; inspect stem base for frass (sawdust-like).  Control when moths are consistently caught. | Inject Bacillus thuringiensis into stems.  [more than one option can be listed] | Carbaryl or permethrin sprays (only if threshold exceeded)  [more than one option can be listed] | Kills beneficial insects. Use only when necessary. Can persist in environment.  [more than one option can be listed] |
| Aphids | Encourage natural predators (ladybugs, lacewings); avoid excessive nitrogen. | etc |  |  |  |

### Application Timing and Targeted Delivery

To minimize the impact of pesticides, application needs to be carefully timed and precisely targeted. This helps to ensure that chemicals are used only when necessary and that their environmental impact is minimized.

* Timing of Application
  + Application During Pest Lifecycle: Pesticides are applied during specific points in the pest lifecycle, such as during early larval stages when pests are most vulnerable. This reduces the need for multiple applications and ensures that pest populations are effectively controlled with minimal chemical use.
  + Weather Considerations: Pesticides are applied during optimal weather conditions (e.g., when wind speed is low and no rain is forecast) to prevent drift and ensure that pesticides remain effective without contaminating surrounding areas or water sources.
* Targeted Delivery
  + Spot Treatment: Instead of applying pesticides across an entire field, targeted or spot treatments are sometimes used to address specific problem areas. This reduces the amount of chemicals used, limits the exposure of non-target organisms and helps prevent resistance to the pesticide in the pest population.
  + Precision Spraying Technology: Modern spraying equipment equipped with sensors and GPS can precisely target pest-infested areas, ensuring that pesticides are applied only where needed. This targeted approach reduces pesticide usage and minimizes environmental impact.

## Reduction of Highly Hazardous Pesticides[[2]](#footnote-3)

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| *Instruction Box – Delete when complete*   * *Provide a description of how to reduce the usage of HHPs, ideally to zero in a) the short term and b) in the long term. For each duration provide how reduction will be measured and the milestones.* * *The section below is generic. Review and modify as required for your company.* |

Due to their significant risks to human health and the environment, including acute (immediate) and chronic (long term) toxicity, and the potential for irreversible harm to ecosystems and non-target organisms, we aim to phase out highly hazardous pesticides (HHPs).

### Short-term targets

Implement the following short-term targets to reduce the usage of high-impact products (e.g., Glyphosate):

* Adopt Integrated Pest Management Practices:
  + Use a variety of non-chemical pest control methods such as biological control (e.g., introducing natural predators), mechanical control (e.g., weeding by hand or using mechanical weeders), and cultural controls (e.g., crop rotation, adjusting planting times, mulching, cover cropping, and mechanical tillage). These methods will be preferred over pesticide usage.
* Substitute with Safer Alternatives:
  + Research and promote the use of safer, less toxic herbicides that pose a lower risk to human health and the environment. For instance, using more selective and lower toxicity pesticides, organic or naturally derived herbicides, or products with less environmental persistence and lower toxicity profiles; and
* Promote Precision Agriculture:
  + Use precision agriculture techniques, such as GPS-guided sprayers, to apply herbicides only where and when they are needed. This reduces the overall quantity of herbicides used resulting in cost savings and minimizes environmental impact.
* Farmer Education and Training:
  + Conduct workshops, training programs, and provide resources to supply chain farmers on the risks of HHPs and the benefits of reducing their use; and
  + Educate supply chain farmers on alternative pest control practices and the effective use of sustainable technologies that improve yields while reducing reliance on chemicals.

Achieve short-term targets by implementing the following:

* Reduce the use of HHPs by 50% within the first year and a further 25% in two years and 100% in three years;
* Regular monitoring of chemical usage via farmer reporting, sales data from chemical suppliers; and
* Track progress through regular assessments, such as annual reviews of pesticide usage and Integrated Pest Management adoption rates across supply chain farms.

### Long-term targets

Implement the following long-term targets to minimize the use of chemical pesticides and ideally fertilizers too.

* Transition to Organic Farming:
  + Promote the widespread adoption of organic farming practices that do not rely on synthetic chemicals. This includes the use of natural pesticides (e.g., neem oil, diatomaceous earth), compost, and organic soil amendments; and
  + Encourage certification programs and establish clear market incentives for organic products to make it economically attractive for farmers to transition.
* Regenerative Agricultural Practices:
  + Promote regenerative farming techniques that focus on building healthy, resilient soils (e.g., through no-till farming, agroforestry, and cover cropping), which can naturally reduce the need for chemical fertilizers and pesticides; and
  + Focus on improving biodiversity within farm ecosystems, which helps naturally control pests and support plant growth without the need for chemical inputs.
* Biological Pest Control and Beneficial Insects:
  + Expand the use of biological control agents, such as beneficial insects (e.g., ladybugs, predatory mites) and microbials, to reduce reliance on chemical pesticides; and
  + Use biopesticides (derived from natural organisms) that target specific pests without harming beneficial insects or pollinators. Note that a low toxicity, highly specific chemical pesticide would be preferred over a higher toxicity, broad spectrum biopesticide.
* Nutrient Recycling and Soil Health:
  + Invest in systems that promote the recycling of nutrients on farms, such as composting organic waste, using cover crops, and implementing integrated nutrient management practices that reduce or eliminate the need for synthetic fertilizers; and
  + Support the development and adoption of soil health practices that build and maintain soil fertility naturally, such as crop rotations, agroecology practices, and manure management.

Achieve long-term targets by implementing the following:

* Eliminate the use of synthetic chemical fertilizers and pesticides within a set timeframe (e.g., 10 years);
* Ongoing monitoring of agricultural input usage, crop yield data, and environmental health indicators (e.g., soil quality, biodiversity); and
* Set periodic milestones, such as 50% reduction by year 5, 75% reduction by year 10, and complete elimination by year 20. Assess progress through periodic reports, data collection from farmers, and environmental studies.

# Management of Pest Control Chemicals

## Selection of Pest Control Chemicals

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| *Instruction Box – Delete when complete*   * *Give a description of the storage structure where your chemical products are being stored. This building must comply to the national building regulation and be built with suitable materials.* * *Also elaborate on how records of chemical supplies, usage and disposal are dated and what measures are being implemented to prevent the leaching of chemicals into water resources during rainfall events.* * *The section below is generic. Review and modify as required for your company.* |

[insert company name] will identify the most up-to-date non-chemical alternatives for pest management to avoid the use of chemicals. When the use of chemicals is unavoidable, the [insert company name] will select pesticides that are the:

* Least hazardous to human health;
* Least hazardous to the environment;
* Least toxic to nontarget organisms;
* Most effective for the target pest; and
* Most cost effective.

The WHO classifies pesticides based on their toxicity into different categories:

* Class 1A (Extremely Hazardous): Pesticides with acute toxicity that pose a significant risk even with small amounts.
* Class 1B (Highly Hazardous): Pesticides with acute toxicity that require stringent safety precautions.
* Class 2 (Moderately Hazardous): Pesticides that are toxic but pose less risk than Class 1A or 1B chemicals.
* Class 3 (Slightly Hazardous): Pesticides with low toxicity.

If chemical options are necessary, ensure that they are not classified as Class 1 (extremely hazardous) or Class 2 (highly hazardous) by the WHO nor listed as HHPs by PAN[[3]](#footnote-4). Use pesticides with low toxicity levels (e.g., Class 3 or 4), and carefully follow all label instructions for safe application.

## Storage of Pesticides

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| *Instruction Box – Delete when complete*   * *Give a description of the general storage requirements for agricultural chemicals. Aspects to consider include: location, ventilation, access control, spill containment etc. and building and structural requirements.* * *The section below is generic. Review and modify as required for your company.* |

Proper storage of agricultural chemicals (such as pesticides and fertilizers) is critical for preventing accidents, environmental contamination, and ensuring worker safety. Refer to the Hazardous Materials Management Plan for guidance on the responsible storage of agricultural chemicals.

It is important to maintain accurate records of all agricultural chemicals received, ensuring they are properly logged with date-stamped entries for inventory tracking, safety, and regulatory compliance.

## Handling and Application of Chemicals

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| *Instruction Box – Delete when complete*   * *Give a brief description on how pest control chemicals are to be used.* * *Describe the system in place, which provides employees with the prescribed protective clothing. Do employees receive thorough training in the safe handling and application of agricultural remedies, as well as in basic first aid? Keep certificates at hand as proof of training.* * *Also describe the procedures and policies that are being followed in the field/orchard while spraying is being done and how employees will be kept out of the sprayed fields for Restricted Entry Intervals.* * *The section below is generic. Review and modify as required for your company.* |

Pesticides will be applied only when they can be effective and when pest quantities meet the economic threshold of insect pests.

When applying pesticides, handlers will mitigate negative impacts by implementing appropriate chemical procedures, including:

* Follow product label directions for safe mixing, application, and disposal;
* Use the correct personal protective equipment (PPE) (e.g. gloves, overalls, eye protection, respiratory system protection).
* Do not use chemicals after expiration date;
* Carefully removing bungs and caps. Chemicals can form gasses that build up pressure over time;
* Replace bungs and caps when not dispensing product;
* Mix and fill spraying tanks in a designated area, away from watercourses and drains;
* Mixing container to be clean and free from previously held product;
* Replace old and leaking mixing containers;
* Clean and disinfect the inside and outside of mixing containers frequently;
* Do not dilute ready-to-use products with water or other chemicals;
* Use the application method with the lowest environmental, health and safety (EHS) risk;
* Select application technologies and practices designed to minimise overspray or runoff (e.g. low-drift nozzles, large droplet sizes, low pressures);
* Establish buffer zones around watercourses, housing, offices, livestock and food storage areas (refer to Annex A for a list of guidelines on buffer zones);
* For aerial applications, the boundaries of target areas should be clearly demarcated and all housing, offices, livestock, and rivers identified in the flight plan. Do not aerially spray where there is potential for contamination of organic or otherwise certifiable production;
* Ensure that all equipment is in good condition and properly calibrated to apply the correct dosage; and
* Only apply pesticides under suitable weather conditions; avoid wet weather and windy conditions.
* Restrict employees from re-entry into sprayed fields for the Restricted Entry Interval (REI). If the pesticide label does not include an REI, a general rule of thumb is to establish an REI of 24 hours for a slightly toxic pesticide and 48 hours for moderately or very toxic pesticides. If entry is necessary during the REI, workers must wear appropriate personal protective equipment (PPE) as specified on the pesticide label. Unless specified on the label, REIs do not apply to biopesticides such as microbials, pheromones, and other semiochemicals and non-conventional pesticides.
* Post warning signs that state when treated areas can be re-entered. Warning signs should also incorporate symbols, e.g. a stop sign or skull and cross bones, so that it is clear to everyone that the area is restricted. Signs should be posted on all likely entry corners of the field.
* If a person got exposed in a freshly sprayed field, wash affected skin parts immediately. Have them get out of the area, change clothes, and see a doctor if necessary.

## Chemical Filling Stations

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| *Instruction Box – Delete when complete*   * *Give a brief description on how filling stations should be designed and constructed to prevent pollution, as well as how excess spray mixtures should be taken care of. Remember water that is used to rinse out spray tanks must not contaminate the soil or end up in ditches, rivers or storage dams.* * *The section below is generic. Review and modify as required for your company.* |

The design and management of filling stations are crucial to ensure the safe use of pesticides while preventing pollution.

### Design and Construction of Filling Stations

Below are design and structural requirements which need to be adhered to:

* Spill Containment: Filling stations must be designed with spill containment measures, such as bunded areas (raised barriers around the station) or containment trays to capture any spills or accidental overflows during the filling or mixing of pesticides. This ensures that any spillages do not leak into the environment.
* Impermeable Surfaces: The area surrounding the filling station should be paved with impermeable surfaces (e.g., concrete or asphalt) to prevent chemicals from soaking into the soil. These surfaces make it easier to clean spills and minimize contamination risks.
* Efficient Drainage System: A well-designed drainage system directs any excess liquids, including spills, runoff, or wash water, to a collection tank or settling pond. This system ensures that chemicals do not enter soil, rivers, ditches, or storage dams, which could lead to pollution.
* Wastewater endpoint management: In areas where access to a municipal treatment plant is unavailable or impractical, collected wastewater must be managed safely and effectively on-site. The following best practices are recommended:
  + Evaporation Ponds: Fully lined and engineered evaporation ponds can safely contain and evaporate wastewater. Residues must be periodically removed and disposed of responsibly.
  + Constructed Wetlands: Engineered systems that mimic natural wetlands to treat wastewater using plants, soil, and microbes. Can remove nutrients and degrade organic pollutants, including some pesticide compounds. Only suitable for low-volume, consistent wastewater flows.
  + Biobeds or Biofilters: These low-cost systems use organic material (e.g., straw, compost, and soil) to biologically break down pesticide residues. They are well suited for small-scale, rural operations.
  + Wastewater Reuse: Collected rinse water may be reused for initial rinses of tanks or equipment, reducing total waste volume.
  + Hazardous Waste Collection: Where feasible, coordinate with certified hazardous waste contractors to remove and properly treat chemical waste off-site.
* Dedicated Rinse Stations: Rinse water used to clean spray tanks must be collected in a designated rinse area to ensure it doesn’t flow into the environment. Rinse water should be stored in sealed containers and either reused for further rinsing cycles or treated before disposal.

### Handling of Excess Spray Mixtures

Any excess pesticide mixture should be carefully returned to its original container for reuse or future application. This reduces waste and ensures that chemicals are not discarded improperly. If excess mixtures cannot be reused, they should be stored in approved waste containers specifically designed for hazardous chemicals. These containers should be securely sealed and stored in a designated area until they can be disposed of according to local environmental regulations. In some cases, excess pesticide mixtures may need to be neutralized using approved chemical agents or techniques before disposal, ensuring that harmful substances are broken down or rendered harmless before disposal.

### Management of Rinse Water

Water used to rinse spray tanks should never be allowed to run into the soil, ditches, rivers, or storage dams. It must be collected in rinsing tanks or settling ponds. These systems ensure that pesticide residues do not spread into the surrounding environment.

If possible, rinse water should be added to the mixed pesticide to make up the water content. It could also be reused for further rinsing of equipment to minimize waste and environmental impact.

If rinse water cannot be reused or treated, it should be disposed of safely, following the appropriate disposal procedures for hazardous waste. This might include transporting it to a specialized disposal facility or neutralizing the chemical content before disposal.

## Spray Drift and Chemical Run-off

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| *Instruction Box – Delete when complete*   * *Describe what precautionary measures are implemented during the application of chemicals to prevent spray drift from polluting the environment, natural water sources or adjacent properties. Also describe what measures are taken to prevent chemical run-off into water resources.* * *The section below is generic. Review and modify as required for your company.* |

Spray drift occurs when droplets of chemicals, such as pesticides, are carried away by wind or air currents. To minimize spray drift, applications should only be made under favorable weather conditions. Wind speed and direction should be monitored. It is recommended to apply chemicals when the wind is below 15 km/h (approximately 9 mph) and blowing away from sensitive areas (e.g., water bodies, neighboring properties, or wildlife habitats). Application should be done during times of lower wind speed, such as early mornings or late evenings, when the air is more stable and evaporation is less likely.

Low-drift nozzles or drift-reducing nozzles can be used to produce larger droplets that are less likely to be carried away by the wind. This reduces the chances of drift and ensures that the chemicals stay in the targeted area.

Ensure that the application equipment is properly calibrated to deliver the correct volume of chemicals at the right pressure. Over-application or incorrect settings can result in fine droplets that are more susceptible to drifting.

To prevent runoff into water resources, practices such as avoiding application before rain, using efficient irrigation, implementing erosion control, and selecting low-solubility chemicals are key. The following measures are commonly taken to prevent runoff into natural water resources:

* Weather forecasting should be used to ensure that chemicals are not applied just before expected rainfall. Rain can wash chemicals off the target area and into nearby water sources. A waiting period is usually recommended after pesticide application before rain is expected.
* Avoid over-irrigating fields after chemical application, as this increases the risk of runoff. Implement efficient irrigation techniques, such as drip irrigation or sprinkler systems, which reduce excess water application.
* On sloped land, terracing, contour ploughing, or the installation of erosion control barriers (such as silt fences or vegetation) can help prevent water runoff from carrying chemicals into water sources.
* Pesticides and chemicals with low water solubility are less likely to be carried away by runoff, as they do not dissolve easily in water. Choosing chemicals with low water solubility reduces the likelihood of contamination in nearby water sources.

## Disposal of Empty Containers

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| *Instruction Box – Delete when complete*   * *Describe how empty containers are to be safely disposed of. When you make use of a contractor to remove the containers, keep certificates of invoices at hand as proof.* * *The section below is generic. Review and modify as required for your company.* |

Safe disposal of empty pesticide containers is necessary to prevent environmental contamination, harm to human health, and ensure regulatory compliance. Empty containers should be safely disposed of as follows:

* Before disposal, pesticide containers should be triple rinsed to remove any remaining residues.
* Once thoroughly rinsed, the empty container should be punctured to prevent reuse and then crushed to reduce its volume. This also makes it easier to handle and store the container safely for disposal.

If a contractor is used for the disposal of empty pesticide containers, ensure that the contractor is licensed and certified for the disposal of hazardous waste. They should comply with all local regulations regarding the safe disposal of pesticide containers.

Always keep waste disposal certificates and invoices from the contractor as proof of safe disposal and to verify compliance with environmental regulations.

## Calibration of Spray Application Equipment

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| *Instruction Box – Delete when complete*   * *Describe key factors which need to be considered when calibrating spray equipment. What aspects should be taken into consideration during calibration and is the calibration according to label recommendation.* * *The section below is generic. Review and modify as required for your company.* |

Calibrating spray application equipment for pesticides involves ensuring accurate and uniform application by measuring and adjusting the equipment's output to deliver the correct amount of pesticide per area.

During calibration, several important factors need to be taken into consideration to ensure accurate pesticide application, namely: spray pressure, flow rate, speed of application, nozzle type and spacing, application rate (as per the manufacturer’s label), spray volume and environmental factors such as wind speed, humidity and temperature to minimise the risk of spray drift and ensure uniform coverage.

Regular calibration should occur at the beginning of the spraying season, after equipment maintenance, when changing products, or whenever environmental conditions change. Key factors, such as spray pressure, flow rate, speed, nozzle type, and environmental conditions, should be considered during calibration to ensure that the application aligns with the pesticide label recommendations. This ensures optimal pest control, minimizes waste, and protects the environment.

# Monitoring and Reporting

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| *Instruction Box – Delete when complete*   * *Describe pest and disease monitoring and reporting procedures, including infestation thresholds, pesticides used, date sprayed, volume used etc.* * *Include the monitoring frequencies, i.e. monthly, quarterly or annual monitoring requirements in line with any statutory requirements and / or permit or licensing requirements.* * *The section below is generic. Review and modify as required for your company.* |

Effective pest management requires regular monitoring, accurate documentation, and strict compliance with safety and environmental standards.

## Pest Observations

Designated Integrated Pest Management team members will conduct weekly inspections during the growing season to monitor pest populations, crop health, and signs of disease.

Pest scouting will include:

* Identification of pest species and crop damage
* Assessment of population levels relative to economic thresholds
* Recommendations for action (chemical or non-chemical)

All pest observations and control actions will be recorded in the IPM Logbook or a digital pest tracking system.

Records shall include the infestation threshold, control method used, and details of any pesticide applications.

Refer to Annex B for a Sample of Record-Keep Table

## Pesticide Safety and Compliance

Only approved pesticides will be used, and application will follow label directions and local regulations.

Prior to use, pesticide handlers will:

* Check expiry dates to ensure product integrity;
* Inspect containers for damage or leaks;
* Ensure pesticides are stored correctly, in a secure, ventilated, and clearly labelled chemical storage facility, away from water sources, food, and animal feed;
* Maintain an updated inventory of all pesticides on site; and
* Ensure Safety Data Sheets (SDS) (or equivalent pesticide safety documentation) are available, accessible, and reviewed by all handlers.

## Incident Reporting

If a health or safety incident occurs during pest control activities (e.g., pesticide exposure, injury, or equipment malfunction), an incident report must be filled out (refer to the Company Incident and Investigation Reporting Procedure).

Investigate the cause of the incident to prevent recurrence and take corrective actions and update safety protocols accordingly. This may include reviewing safety protocols, training, or equipment maintenance procedures.

Ensure that incidents are reported in compliance with relevant local health and safety regulations.

# Training and Awareness

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| *Instruction Box – Delete when complete*   * *Include training that is provided to employees and contractors on the requirements of the IPM Plan.* * *The section below is generic. Review and modify as required for your company.* |

[insert company name] recognises the need for staff and contractors to be appropriately trained with respect to the implementation of this IPM Plan.

All personnel and contractors shall be provided with training and awareness in respect of this IPM Plan, to ensure pests are managed appropriately in line with requirements of industry standards and in-country legislation.

Training and awareness shall be presented via the following platforms:

* Printed materials (i.e. this IPM Plan and overview of pest control protocols and related laws and regulations);
* Toolbox talks and safety briefings; and
* On-the-job training and demonstrations.

Training is to be provided as part of the onboarding process for new employees and contractors, as well as regular updates for all staff.

Additionally, raise awareness weekly or bi-weekly, before the start of the workday or during shifts.

# Review and Continuous Improvement

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| *Instruction Box – Delete when complete*   * *Include measures for regular monitoring of the effectiveness of this IPM Plan.* * *State the frequency of the review and update of this IPM Plan to ensure that it reflects and caters for any emerging issues and/or that it aligns with changes in regulations.* * *The section below is generic. Review and modify as required for your company.* |

Undertake regular assessments of the IPM Plan’s effectiveness to ensure ongoing success and seek feedback from employees, stakeholders, or contractors to make any necessary adjustments and updates to the IPM Plan.

This IPM Plan is a live document that will need to be reviewed on an annual basis to incorporate lessons learned, address any gaps, and adapt to changes in the regulatory environment and to assess its relevance and coverage of subject matter management issues and objectives.

As part of the annual Environmental and Social Management System (ESMS) compliance audit, undertake a compliance review of the IPM Plan to identify areas for improvement.

# Roles and Responsibilities

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| *Instruction Box – Delete when complete*   * *Assign roles and responsibilities for the implementation of the IPM Plan.* * *Select responsible employees, perhaps from your existing management team, to take charge of this IPM Plan.* * *The section below is generic. Review and modify as required for your company.* |

The key roles and responsibilities for the implementation of the IPM Plan are described in **Table 10‑1** *[modify as required].*

**Table 12.1: Key Roles and Responsibilities**

| **Role** | **Responsibility** |
| --- | --- |
| **Environmental, Social, and Governance (ESG) or Sustainability Manager** | * With support from the Agronomy Manager (if applicable), ensure the IPM Plan is implemented consistently across the entire farm or operation, coordinating efforts between different roles and departments. * Ensure that pest management practices align with the farm or operation’s sustainability goals, balancing effective pest control with minimal environmental impact. * Maintain records and provide regular reports on the farm’s environmental performance regarding pest management. This includes evaluating pesticide use, waste disposal, and any environmental impacts. * Monitor the environmental impact of pest control measures, ensuring that practices comply with sustainability standards, such as reducing chemical usage, preventing pesticide runoff, and protecting biodiversity. |
| **Agronomy Manager (if applicable)** | * Oversee the regular scouting and monitoring of crops for pests and diseases. Set thresholds for pest populations and determine when to take action based on established IPM practices. * Make informed decisions on pest control methods, selecting the appropriate intervention (biological, cultural, chemical) based on pest thresholds, crop health, and environmental considerations. |
| **Field Worker / Farm Worker** | * Perform regular scouting and monitoring of crops for pest and disease activity, recording observations and reporting findings. * Carry out routine monitoring and physical checks for pests and diseases, including visually inspecting crops, looking for damage or symptoms of pest activity. * Report pest sightings, crop damage, and any irregularities to crop supervisors or the IPM coordinator immediately. * Maintain good field sanitation practices by removing plant debris, dead pests, or damaged crops that could harbor pests or diseases. |
| **Spray Equipment Operator/Applicator** | * Responsible for the safe and accurate application of pesticides, herbicides, fungicides, and other control agents, following the recommendations and protocols outlined in the IPM Plan. * Calibrate spray equipment regularly to ensure that pesticide application rates are accurate and consistent, preventing overuse or underuse. Maintain spray equipment to ensure it is in good working condition. * Monitor weather conditions, such as wind speed and temperature, to prevent spray drift or chemical runoff that could affect neighboring crops, water sources, or non-target organisms. * Properly dispose of empty pesticide containers, excess mixtures, and rinse water according to environmental and regulatory standards to prevent contamination of the soil and water. * Keep detailed records of pesticide applications, including the type of pesticide used, the amount applied, the date of application, and the areas treated. This is important for both compliance and monitoring the effectiveness of pest control efforts. |
| **Health and Safety Officer (if appointed)** | * Oversee safety protocols, ensure compliance with safety regulations, and provide training on pesticide handling. * Monitor adherence to safety standards during pest control activities, ensuring the proper use of PPE and safe pesticide storage and application procedures. * Investigate any incidents involving pesticide exposure or other safety hazards and implement corrective actions to prevent future occurrences. |

# ANNEX A: General Guidelines for Buffer Zones

The appropriate buffer zone distance when applying pesticides depends on several factors, including the type of pesticide, application method, proximity to sensitive areas, and national/local regulations. However, various international guidelines and best practices provide general recommendations that can help guide your Integrated Pest Management (IPM) Plan.

*FAO International Code of Conduct on Pesticide Management*

The FAO recommends the use of vegetated no-spray buffer strips between treated fields and adjacent areas to reduce pesticide runoff and provide habitats for beneficial organisms. While specific distances aren't prescribed, the emphasis is on implementing buffer zones based on risk assessments and environmental considerations.

*United States - Environmental Protection Agency (EPA):*

The EPA mandates buffer zones for certain pesticide applications, especially soil fumigants. For instance, the minimum buffer zone distance is 25 feet (7.62 m), with the possibility of extending up to ½ mile (2,640 feet or 805 m) depending on factors like application rate and method. The EPA provides detailed tables and calculators to determine the appropriate buffer zone based on specific conditions.

*Canada*

Health Canada offers a Spray Buffer Zone Calculator that allows applicators to determine required buffer zones based on product labels, application methods, and environmental conditions. The calculator helps adjust buffer zones to minimize off-site drift and protect sensitive areas.

The Saskatchewan Ministry of Agriculture provides a complimentary online mapping tool for specialty crops and bees within the province via FieldWatch. This tool allows for the mapping of sensitive crops and is freely accessible to applicators. Pesticide applicators are encouraged to register on the platform to identify vulnerable crops, thereby facilitating the planning of pesticide applications.

# ANNEX A: IPM Record-Keeping Table

| **Date** | **Pest Observed** | **Crop Affected** | **Infestation Threshold** | **Action Taken** | **Pesticide Used** | **Volume Applied (L/hectare)** | **Application Method** | **Applicator Name** | **Weather Conditions** |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 15 May 2025 | Aphids | Tomatoes | Above threshold | Chemical control | Imidacloprid 200 SL | 0.5 | Knapsack sprayer | John Smith | Dry, 25°C |
| 22 May 2025 | Armyworms | Maize | Spot infestation | Spot treatment only | Lambda-cyhalothrin | 0.5 | Motorized sprayer | John Smith | Cloudy and humid, 25°C |

1. Pesticides are substances used for destroying insects or other organisms (e.g. fungi, disease, weeds) harmful to cultivated plants or to animals. Includes fungicides, herbicides, etc. [↑](#footnote-ref-2)
2. Identify HHPs listed in https://pan-international.org/wp-content/uploads/PAN\_HHP\_List.pdf. [↑](#footnote-ref-3)
3. Identify HHPs listed in https://pan-international.org/wp-content/uploads/PAN\_HHP\_List.pdf. [↑](#footnote-ref-4)