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## **PRIMARY FARM ASSURANCE**

All Farm Base - Crops Base - Combinable Crops

CONTROL POINTS AND COMPLIANCE CRITERIA  
FOUNDATION LEVEL

ENGLISH VERSION 5.0\_OCT19  
BASED ON INTEGRATED FARM ASSURANCE V5.2

VALID FROM: 15 OCTOBER 2019  
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**Control Points and Compliance Criteria**  
**PRIMARY FARM ASSURANCE – Foundation Level**  
**ALL FARM BASE**

**Based on IFA CPCC V5.2**

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## INTRODUCTION

- a) The Primary Farm Assurance (PFA) Control Points and Compliance Criteria (CPCC) documents are separated into different modules, each one covering different areas or levels of activity on a production site.  
These modules are grouped into:
- (i) “Scopes” – covering more generic production issues, classified more broadly and
  - (ii) “Sub-scopes” – covering more specific production details, classified per product type.
- b) FoodPLUS GmbH and GLOBALG.A.P. approved certification and verification bodies are not legally liable for the safety of the product covered under this standard and not liable for the data accuracy and completeness in the GLOBALG.A.P. database entered by the certification and/or verification body. Under no circumstances shall FoodPLUS GmbH, its employees or agents be liable for any losses, damage, charges, costs or expenses of whatever nature (including consequential loss) which any producer may suffer or incur by reason of, or arising directly or indirectly from the administration by FoodPLUS GmbH, its employees or agents or the performance of their respective obligations in connection with the scheme save to the extent that such loss, damage, charges, costs and/or expenses arise as a result of the finally and judicially determined gross negligence or willful default of such person.

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N°	Control Points	Compliance Criteria	Level
AF	<b>ALL FARM BASE</b>		
	<i>Control points in this module covers issues relevant to all farming businesses and are applicable to all producers.</i>		
AF 1	<b>SITE HISTORY AND SITE MANAGEMENT</b>		
	<i>One of the key features of sustainable farming is the continuous integration of site-specific knowledge and practical experience into future management planning and practices. This section is intended to ensure that the land, buildings, and other facilities which constitute the fabric of the farm, are properly managed to ensure the safe production of food and protection of the environment.</i>		
AF 1.1	<b>Site History</b>		
AF 1.1.1	Is there a reference system for each field, orchard, greenhouse, yard, plot, and/or other area/location used in production?	Compliance shall include visual identification in the form of: <ul style="list-style-type: none"> <li>• A physical sign at each field/orchard, greenhouse/yard/plot, or other farm area/location</li> </ul> or <ul style="list-style-type: none"> <li>• A farm map, which also identifies the location of water sources, storage/handling facilities, ponds, etc., and that could be cross-referenced to the identification system</li> </ul> No N/A.	Minor Must
AF 1.2	<b>Site Management</b>		
AF 1.2.1	Is there a risk assessment available for all sites registered (this includes rented land, structures and equipment) and does this risk assessment show that the site in question is suitable for production, with regards to food safety and the environment?	A written risk assessment to determine whether the sites are appropriate for production shall be available for all sites. It shall be ready for the initial inspection and maintained updated and reviewed when new sites enter in production and when risks for existing ones have changed, or at least annually, whichever is shorter. The risk assessment may be based on a generic one but shall be customized to the farm situation. Risk assessments shall take into account: <ul style="list-style-type: none"> <li>• Potential physical, chemical (including allergens), and biological hazards</li> <li>• Site history (for sites that are new to agricultural production, history of 5 years is advised and a minimum of one year shall be known)</li> <li>• Impact of proposed enterprises on adjacent stock/crops/environment. (Annex AF 1 and Annex AF 2 for guidance on risk assessments. Annex FV 1 includes guidance regarding flooding.)</li> </ul>	Minor Must

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N°	Control Points	Compliance Criteria	Level
AF 1.2.2	Has a management plan that establishes strategies to minimize the risks identified in the risk assessment (AF 1.2.1) been developed and implemented?	A management plan addresses the risks identified in AF 1.2.1 and describes the hazard control procedures that justify that the site in question is suitable for production. This plan shall be appropriate to the farm operations, and there shall be evidence of its implementation and effectiveness.	Minor Must
<b>AF 2</b>	<b>RECORD KEEPING</b>		
<i>Important details of farming practices shall be recorded, and records kept.</i>			
AF 2.1	Are all records requested during the external inspection accessible and kept for a minimum period of 2 years, unless a longer requirement is stated in specific control points?	Producers shall keep up-to-date records for a minimum of 2 years. Electronic records are valid and when they are used, producers are responsible for maintaining back-ups of the information. For the initial inspections, producers shall keep records from at least 3 months prior to the date of the external inspection or from the day of registration, whichever is longer. New applicants shall have full records that reference each area covered by the registration with all of the agronomic activities related to PFA documentation required for this area. This refers to the principle of record keeping. When an individual record is missing, the respective control point dealing with those records is not compliant. No N/A.	Minor Must

N°	Control Points	Compliance Criteria	Level
<b>AF 3</b>	<b>HYGIENE</b>		
	<p><i>People are key to the prevention of product contamination. Farm staff and contractors as well as producers themselves stand for the quality and safety of the product. Education and training will support progress toward safe production. This section is intended to ensure good practices to diminish hygiene risks to the product and that all workers understand the requirements and are competent to perform their duties.</i></p> <p><i>Further hygiene requirements, specific to certain activities such as harvest and product handling, are defined in the applicable standard module.</i></p>		
AF 3.1	Does the farm have a documented hygiene procedure and visibly displayed hygiene instructions for all workers and visitors to the site whose activities might pose a risk to food safety?	<p>The farm shall have a hygiene procedure addressing the risks. The farm shall also have hygiene instructions visibly displayed for workers (including subcontractors) and visitors; provided by way of clear signs (pictures) and/or in the predominant language(s) of the workforce. The instructions must include at a minimum:</p> <ul style="list-style-type: none"> <li>• The need to wash hands</li> <li>• The need to cover skin cuts</li> <li>• Limitation on smoking, eating, and drinking to designated areas</li> <li>• Notification of any relevant infections or conditions. This includes any signs of illness (e.g., vomiting, jaundice, diarrhea), whereby these workers shall be restricted from direct contact with the product and food-contact surfaces</li> <li>• Notification of product contamination with bodily fluids</li> <li>• The use of suitable protective clothing, where the individuals' activities might pose a risk of contamination to the product.</li> </ul>	Minor Must
AF 3.2	Have all persons working on the farm received annual hygiene training appropriate to their activities and according to the hygiene instructions in AF 3.1?	An introductory training course for hygiene shall be given in both written and verbal form. All new workers shall receive this training and confirm their participation. This training shall cover all instructions defined in AF 3.1. All workers, including the owners and managers, shall annually participate in the farm's basic hygiene training.	Minor Must
AF 3.3	Are the farm's hygiene procedures implemented?	Workers with tasks identified in the hygiene procedures shall demonstrate competence during the inspection and there is visual evidence that the hygiene procedures are being implemented. No N/A.	Major Must

N°	Control Points	Compliance Criteria	Level
<b>AF 4</b>	<b>WORKERS' HEALTH, SAFETY, AND WELFARE</b>		
	<i>People are key to the safe and efficient operation of any farm. Farm staff and contractors as well as producers themselves stand for the quality of the produce and for environmental protection. Education and training will help progress towards sustainability and build on social capital. This section is intended to ensure safe practices in the work place and that all workers understand and are competent to perform their duties; are provided with proper equipment to allow them to work safely; and that, in the event of accidents, can obtain proper and timely assistance.</i>		
<b>AF 4.1</b>	<b>Hazards and First Aid</b>		
AF 4.1.1	Are first aid kits available at all permanent sites and in the vicinity of fieldwork?	Complete and maintained first aid kits (i.e., according to local recommendations and appropriate to the activities being carried out on the farm) shall be available and accessible at all permanent sites and readily available for transport (tractor, car, etc.)	Minor Must
<b>AF 4.2</b>	<b>Protective Clothing/Equipment</b>		
AF 4.2.1	Are workers, visitors, and subcontractors equipped with suitable protective clothing in accordance with legal requirements and/or label instructions and/or as authorized by a competent authority?	Complete sets of protective clothing, which enable label instructions and/or legal requirements and/or requirements as authorized by a competent authority to be complied which are available on the farm, utilized, and in a good state of repair. To comply with label requirements and/or on-farm operations, this may include some of the following: Rubber boots or other appropriate footwear, waterproof clothing, protective overalls, rubber gloves, face masks, appropriate respiratory equipment (including replacement filters), ear and eye protection devices, life-jackets, etc. as required by label or on-farm operations.	Minor Must
<b>AF 5</b>	<b>WASTE AND POLLUTION MANAGEMENT, RECYCLING, AND RE-USE</b>		
	<i>Waste minimization shall include review of current practices, avoidance of waste, reduction of waste, re-use of waste, and recycling of waste.</i>		
<b>AF 5.1</b>	<b>Waste and Pollution Action Plan</b>		
AF 5.1.1	Is the site kept in a tidy and orderly condition?	Visual assessment shall show that there is no evidence of waste/litter in the immediate vicinity of the production site(s) or storage buildings. Incidental and insignificant litter and waste on the designated areas are acceptable as well as the waste from the current day's work. All other litter and waste shall be cleared up, including fuel spills.	Major Must



N°	Control Points	Compliance Criteria	Level
AF 5.1.2	Provided there is no risk of pest, disease and weed carry-over, are organic wastes composted on the farm and recycled?	Organic waste material is composted and used for soil conditioning. The composting method ensures that there is no risk of pest, disease, or weed carry-over.	Recom.
<b>AF 6</b>	<b>COMPLAINTS</b>		
	<i>Management of complaints will lead to an overall better production system.</i>		
AF 6.1	Is there a complaint procedure available relating to both internal and external issues covered by the PFA standard and does this procedure ensure that complaints are adequately recorded, studied, and followed up, including a record of actions taken?	A documented complaint procedure is available to facilitate the recording and follow-up of all received complaints relating to issues covered by the PFA standard and actions taken with respect to such complaints. In the case of producer groups, the members do not need the complete complaint procedure, but only the parts that are relevant to them. The complaint procedure shall include the notification of GLOBALG.A.P. Secretariat via the certification body (CB)/verification body (VB) in the case that the producer is informed by a competent or local authority that they are under investigation and/or has received a sanction in the scope of the letter of conformance. No N/A.	Major Must
<b>AF 7</b>	<b>RECALL/WITHDRAWAL PROCEDURE</b>		
AF 7.1	Does the producer have documented procedures on how to manage/initiate the withdrawal/recall of PFA compliant products from the marketplace and are these procedures tested annually?	<p>The producer shall have a documented procedure that identifies the type of event that may result in a withdrawal/recall, the persons responsible for making decisions on the possible product withdrawal/recall, the mechanism for notifying the next step in the supply chain and the approved CB/VB, and the methods of reconciling stock.</p> <p>The procedures shall be tested annually to ensure that they are effective. This test shall be recorded (e.g., by picking a recently sold batch, identifying the quantity and whereabouts of the product, and verifying whether the next step involved with this batch and the CB/VB can be contacted. Actual communications of the mock recall to the clients are not necessary. A list of phone numbers and e-mails is sufficient). No N/A.</p>	Major Must

## ANNEX AF 1 GUIDELINE: RISK ASSESSMENT – GENERAL

### Introduction to Risk Assessment

In the Primary Farm Assurance (PFA) standard, a number of risk assessments are required in order to facilitate food safety, workers' health and safety, and environmental protection. This guidance document provides assistance to producers.

### Five Steps to Risk Assessment

A risk assessment is an important step in protecting the products, workers and business, as well as complying with PFA requirements and the law. A risk assessment helps you to focus on those risks that really matter in the workplace—the ones with the potential to cause real and serious harm. In many instances, straightforward, simple, effective, and inexpensive measures can readily control risks (e.g., ensuring spillages are cleaned up promptly so that the product cannot be contaminated).

It is not expected that you eliminate all risks, but you are expected and required to protect your products and workers as far as it is reasonably practicable.

This is not the only way to perform a risk assessment. There are other methods that work well, particularly for more complex risks and/or circumstances. However, we believe this method provides a straightforward approach for most producers. Workers and others have a right to be protected from harm caused by a failure to take reasonable control measures. Accidents and ill health can ruin lives and affect the business as well, if output is lost or you have to go to court. Producers are legally required to assess the risks in their workplace so that a plan to control the risks can be put in place.

### What is Risk Assessment?

A risk assessment is simply a careful examination of what, in your work, could cause harm to the product, environment, and/or workers, so that you can evaluate whether you have taken sufficient precautions or should do more to prevent harm.

*Don't overcomplicate* the process. In many enterprises, the risks are well known, and the necessary control measures are easy to apply. Check that you have taken reasonable precautions to avoid contamination and/or injury.

When thinking about your risk assessment, remember:

- A *hazard* is anything that may cause harm, such as chemicals, electricity, working from ladders, etc.
- The *risk* is the chance, high or low, that these and other hazards, together with an indication of how serious the harm could be, could harm somebody.

### How to Assess the Risks in Your Enterprise

Step 1: Identify the hazards

Step 2: Decide who/what might be harmed and how

Step 3: Evaluate the risks and decide on precautions

Step 4: Record the work plan/findings and implement them

Step 5: Review the assessment and update if necessary

### Step 1: Identify the Hazards

First, you need to identify how the product, environment, and/or workers could be harmed. Here are some tips to help identify the ones that matter:

- Walk around the workplace and look at what could reasonably be expected to cause harm (e.g., situations, equipment, products, practices, etc.).
- Ask the workers (if applicable) or their representatives what they think. They may have noticed things that are not immediately obvious to you.
- Check manufacturers' instructions or data sheets for chemicals and equipment, as these can be very helpful in identifying the hazards and putting them in their true perspective.
- Review prior incidence and accident records, as these often help to identify less obvious hazards. Remember to think about long-term hazards to health (e.g., high levels of noise or exposure to harmful substances) as well as (food) safety hazards.

### Step 2: Decide Who/What Might be Harmed and How

For each hazard, you need to be clear about who or what might be harmed. This will help you identify the best way of managing the risk.

Remember:

- Some activities have particular requirements, (e.g., harvesting).
- Some hazards will require extra thought, especially in situations where individuals (e.g., cleaners, visitors, contractors, maintenance workers, etc.) may not be in the workplace all the time.

### Step 3: Evaluate the Risks and Decide on Precautions

Having spotted the hazards, you then have to decide what to do about them. The law requires you to do everything reasonably practicable to protect people from harm. You can work this out for yourself, but the easiest way is to compare what is being done against what are already defined as good practices.

So first, look at what you are already doing, and think about what controls you have in place and how the work is organized. Then compare that with the good practices and see if there's more you should be doing to bring yourself up to standard. During your evaluation process, consider the following:

- Can I get rid of the hazard altogether?
- If not, how can I manage the risks so that harm is unlikely?

When managing risks, if possible, apply the principles below and, if possible, in the following order:

- Try a less risky option (e.g., switch to using a less hazardous chemical).
- Prevent access to the hazard (e.g., by guarding).
- Organize the work/tasks to reduce exposure to the hazard.
- Issue personal protective equipment (e.g., clothing, footwear, goggles, etc.).
- Provide welfare facilities (e.g., first aid and washing facilities for removal of contamination).

Improving health and safety need not cost a lot. For instance, placing a mirror on a dangerous blind corner to help prevent vehicle accidents is a low-cost precaution considering the risks. Failure to take simple precautions can cost you a lot more if an accident does happen.

Involve staff (if applicable), so that you can be sure that what you propose to do will work in practice and won't introduce any new hazards.

#### **Step 4: Record the Work Plan/Findings and Implement Them**

Putting the results of the risk assessment into practice will make a difference when looking after food safety, workers' health and safety, and your business.

Writing down the results of the risk assessment and sharing them with your staff encourages you to complete the implementation.

When writing down the results, keep it simple (e.g., contamination at harvest: handwashing facilities at the field).

The risk assessment is not expected to be perfect, but it shall be suitable and sufficient. You need to be able to show that:

- A proper check was made.
- You asked who or what might be affected.
- You dealt with all the significant hazards.
- The precautions are reasonable, and the remaining risk is low.
- You involved your staff or their representatives (where applicable) in the process.

A good plan of action often includes a mixture of different responses such as:

- Temporary solution until more reliable controls can be put in place.
- Long-term solutions to those risks most likely to cause accidents or ill health.
- Long-term solutions to those risks with the worst potential consequences.
- Arrangements for training employees on the primary risks that remain and how these risks are to be controlled.
- Regular checks to make sure that the control measures stay in place.
- Clearly defined responsibilities. Who will lead on what action and by when?

Remember, prioritize and tackle the most important things first. As you complete each action, tick it off your work plan.

### Step 5: Review the Risk Assessment and Update if Necessary

Few enterprises stay the same. Sooner or later, you will bring in new equipment, substances, and/or procedures that could lead to new hazards. It makes sense, therefore, to review what you are doing on an ongoing basis. Every year formally review where you are with respect to recognized good practices to make sure you are still improving, or at least not sliding back.

Look at your risk assessment again:

- Have there been any changes?
- Are there improvements you still need to make?
- Have your workers spotted problems?
- Have you learned anything from incidences or near misses?
- *Make sure your risk assessment stays up-to-date.*

When you are running a business, it's all too easy to forget about reviewing your risk assessment—until something has gone wrong and it's too late. Why not set a review date for this risk assessment now? Write it down and note it in your diary as an annual event.

During the year, if there is a significant change, don't wait. Check the risk assessment and, where necessary, amend it. If possible, it is best to think about the risk assessment when you're planning a change—that way there is more flexibility.

Source: 'Five Steps to Risk Assessment, Health and Safety Executive' ([www.hse.gov.uk/pubns/indg163.pdf](http://www.hse.gov.uk/pubns/indg163.pdf)) [www.hse.gov.uk/pubns/indg163.pdf](http://www.hse.gov.uk/pubns/indg163.pdf)

## ANNEX AF 2 GUIDELINE: RISK ASSESSMENT – SITE MANAGEMENT

Control points AF 1.2.1 (m) and AF 1.2.2 (m) require producers to carry out a risk assessment of their production site and to take appropriate action to mitigate any risks identified.

### Control Point AF 1.2.1

Is there a risk assessment available for all sites registered this includes rented land, structures, and equipment) and does this risk assessment show that the site in question is suitable for production, with regards to food safety, and the environment?

### Compliance Criterion AF 1.2.1

A written risk assessment to determine whether the sites are appropriate for production shall be available for all sites. It shall be ready for the initial inspection and maintained, updated and reviewed when new sites enter in production, and when risks for existing ones have changed, or at least annually, whichever is shorter. The risk assessment may be based on a generic one but shall be customized to the farm situation.

Risk assessments shall take into account:

- Potential physical, chemical (including allergens) and biological hazards
- Site history (for sites that are new to agricultural production, history of 5 years is advised and a minimum of one year shall be known)
- Impact of proposed enterprises on adjacent stock/crops/environment

(See Annex AF 1 and Annex AF 2 for guidance on risk assessments. Annex FV 1 includes guidance regarding flooding.)

### Control Point AF 1.2.2

Has a management plan that establishes strategies to minimize the risks identified in the risk assessment (AF 1.2.1) been developed and implemented?

### Compliance Criterion AF 1.2.2

A management plan addresses the risks identified in AF 1.2.1 and describes the hazard control procedures that justify that the site in question is suitable for production. This plan shall be appropriate to the products being produced, and there shall be evidence of its implementation and effectiveness.

NOTE: Environmental risks do not need to be part of this plan and are covered under AF 7.1.1 in the GLOBALG.A.P. IFA standard.

The risk assessment should consider relevant physical, chemical and microbiological hazards and take into account the type of farm operation and the way in which farm output will, eventually, be used. The next table helps to identify the most common factors and hazards to consider when carrying out a site risk assessment. This is not an exhaustive list of factors. Growers shall consider it as guidance designed to help trigger their analysis of farm conditions in order to prepare the risk assessment for the site. They shall not consider these examples as a comprehensive list.

### 1. Legislation:

Legislation (national or local) may restrict the farm operations. Local regulations should be checked first to verify legal compliance.

### 2. Prior Use of Land:

Example of factors to consider	Example of risks that can be involved
Previous crops	Some crops (e.g., cotton production) typically involve heavy use of residual herbicides that can have long-term effects on cereal and other vegetable crops.
Former use	Industrial or military use can cause contamination to land through residues, petroleum contamination, garbage storage, etc. Landfill or mining sites may have unacceptable waste in their subsoil that can contaminate subsequent crops or harm livestock. They may be subject to sudden subsidence endangering persons working on the land. Husbandry may create zones of high microbial content (manure deposit, etc.).

### 3. Soil:

Example of factors to consider	Example of risks that can be involved
Soil structure	Structural suitability for intended use (including susceptibility to erosion) and chemical/microbiological integrity.
Erosion	Conditions that cause losses of topsoil by water/wind that may affect crop yields and/or affect land and water downstream.
Susceptibility to flooding	Susceptibility to flooding and probable contamination of soil through the flood.
Wind exposure	Excessive wind speeds can cause crop losses.

#### 4. Water:

Example of factors to consider	Example of risks that can be involved
Water availability	Adequacy throughout the year, or at least the proposed growing season. The amount of water supply shall at least match the consumption of the intended crops. Water shall be available in a sustainable condition.
Water quality	The risk assessment should establish whether water quality is 'fit for purpose'. In some instances, 'fit for purpose' may be defined by a local authority. Evaluate probabilities of upstream contamination (sewage, animal farms, etc.) that may need costly treatments. For certain applications, the grower shall be aware of a minimum microbiological water quality specified by the authority or PFA. Where this is the case, the requirements are specified in the relevant PFA module (WHO Guidelines for Drinking-Water Quality, 2008: <i>E. coli</i> or thermo-tolerant coliform bacteria shall not be detectable in any 100ml sample). See also FV 1.1.1 under FV 1.1 'Risk Assessment'.
Authorization to use water	Rights or license of use of water: local laws or customs may recognize other users whose needs may pre-empt agricultural use at times. Environmental impact: while legal, some extraction rates could adversely affect flora and fauna associated with or dependent on the water source.



## 5. Allergens:

Food allergies have received much attention over the past few years with an estimated 2% of adults and 5% of children now suffering from some type of food allergy.

All foods have the potential to cause a food allergy, however there are groups of foods that are responsible for causing the majority of food allergies. In the EU, for example, 14 main allergens which are subject to labeling legislation have been identified: celery, cereals containing gluten, eggs, fish, lupin (a kind of legume of the Fabaceae family), milk, molluscs, mustard, peanuts, sesame seeds, shellfish, soya, sulfur dioxide (used as an antioxidant and preservative, e.g., in dried fruits), and tree nuts.

Whilst the control of allergens is crucial for food processors and caterers, it is also a relevant issue to be considered by primary producers.

Allergens in fruits and vegetables are not as complicated as other foods. Cooking destroys many of them, and thus cooked fruits are often safe for fruit allergic people to eat. Peanut allergy can be so severe that only very tiny amounts of peanut can cause a reaction. Tree nuts such as Brazil nut, hazelnut, walnut, and pecan can cause symptoms as severe.

Lists of food allergens and information on labelling can be found on national or EU websites (see AF 1.2.1, AF 1.2.2)

Example of factors to consider	Example of risks that can be involved
Previous crops	Mechanical harvest of crops in rotation with peanuts (legume grown underground) might introduce rests of peanuts. Transportation of produce in vehicles that have transported products in the group of main allergens may introduce cross-contamination if vehicles are not adequately cleaned.
Product handling	Cross-contamination when packing and/or storing of products in the same facilities with those considered amongst main food allergens.

## 6. Other impacts:

Example of factors to consider	Example of risks that can be involved
Impacts on the neighborhood	Dust, smoke and noise problems caused by the operation of agricultural machinery. Contamination of downstream sites by silt-laden or chemical-laden runoff. Spray drift.
Impacts on the farm	Type of adjacent farming activities. Smoke, fumes, and/or dust from nearby industrial or transport installations, including roads with heavy traffic. Insects attracted by crops, waste products and/or operations using manure. Depredations by pests from nearby natural or conservation areas.

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**Control Points and Compliance Criteria**  
**PRIMARY FARM ASSURANCE – Foundation Level**  
**CROPS BASE**

**Based on IFA CPCC V5.2**

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**ANNEX CB 2 GUIDELINE: PLANT PROTECTION PRODUCT USE IN COUNTRIES THAT ALLOW EXTRAPOLATION**

**ANNEX CB 3 GUIDELINE: CB 4.5 RESIDUE ANALYSIS**

**ANNEX CB 4 GUIDELINE: VISUAL INSPECTION AND FUNCTIONAL TESTS OF APPLICATION EQUIPMENT**

N°	Control Points	Compliance Criteria	Level
<b>CB</b>	<b>CROPS BASE</b>		
<b>CB 1</b>	<b>TRACEABILITY</b>		
	<i>Traceability facilitates the recall/withdrawal of foods and flowers and ornamentals and enables customers to be provided with targeted and accurate information concerning implicated products.</i>		
CB 1.1	Is a Primary Farm Assurance (PFA) registered product traceable back to and trackable from the registered farm (and other relevant registered areas) where it has been produced and, if applicable, handled?	There is a documented identification and traceability system that allows PFA registered products to be traced back to the registered farm or, in a producer group, to the registered farms of the group, and tracked forward to the immediate customer (one step up, one step down). Harvest information shall link a batch to the production records or the farms of specific producers. Produce handling shall also be covered, if applicable. No N/A.	Major Must
<b>CB 2</b>	<b>FERTILIZER APPLICATION</b>		
	<i>The fertilization decision-making process involves consideration of crop demands. Nutrients shall be available for crops in the growing substrate or soil and fertilization is often necessary. Correct application to optimize use and storage procedures to avoid loss and contamination shall be followed.</i>		
<b>CB 2.1</b>	<b>Records of Application</b>		
	<b>2.1.1 to 2.1.6:</b> Do records of all applications of soil and foliar fertilizers, both organic and inorganic, include the following criteria:		
CB 2.1.1	Field, orchard, or greenhouse reference and crop?	Records shall be kept of all fertilizer applications, detailing the geographical area and the name or reference of the field, orchard or greenhouse where the registered product crop is located. Records shall also be kept for hydroponic situations and where fertigation is used. No N/A.	Minor Must
CB 2.1.2	Application dates?	The exact dates (day, month, and year) of the application are detailed in the records of all fertilizer applications. No N/A.	Minor Must
CB 2.1.3	Applied fertilizer types?	The trade name, type of fertilizer (e.g., NPK), and concentrations (e.g., 17-17-17) are detailed in the records of all fertilizer applications. No N/A.	Minor Must
CB 2.1.4	Applied quantities?	The amount of product to be applied in weight or volume relative to a unit of area or number of plants or unit of time per volume of fertigation is detailed in the records of all fertilizer applications. The actual quantity applied shall be recorded, as this is not necessarily the same as the recommendation. No N/A.	Minor Must

N°	Control Points	Compliance Criteria	Level
CB 2.1.5	Method of application?	The method and/or equipment used are detailed in the records of all fertilizer applications. In the case the method/equipment is always the same, it is acceptable to record these details only once. If there are various equipment units, these are identified individually. Methods may be e.g., via irrigation or mechanical distribution. Equipment may be e.g., manual or mechanical. No N/A.	Minor Must
CB 2.1.6	Operator details?	The name of the operator who has applied the fertilizer is detailed in the records of all fertilizer applications.  If a single individual makes all of the applications, it is acceptable to record the operator details only once. If there is a team of workers performing the fertilization, all of them need to be listed in the records. No N/A.	Minor Must
<b>CB 2.2</b>	<b>Fertilizer Storage</b>		
	<b>2.2.1 to 2.2.3:</b> Are all fertilizers stored:		
CB 2.2.1	Separately from PPPs?	The minimum requirement is to prevent physical cross-contamination between fertilizers (organic and inorganic) and PPPs by using a physical barrier (wall, sheeting, etc.). If fertilizers that are applied together with PPPs (i.e., micronutrients or foliar fertilizers) are packed in a closed container, they can be stored with PPPs.	Minor Must
CB 2.2.2	Not together with harvested products?	Fertilizers shall not be stored with harvested products.	Major Must
CB 2.2.3	In an appropriate manner that reduces the risk of contamination of water sources?	All fertilizers are stored in a manner that poses minimum risk of contamination to water sources. Liquid fertilizer stores/tanks shall be surrounded by an impermeable barrier to contain a capacity to 110% of the volume of the largest container, if there is no applicable legislation.	Minor Must
<b>CB 2.3</b>	<b>Organic Fertilizer</b>		
CB 2.3.1	Does the producer prevent the use of human sewage sludge on the farm?	No treated or untreated human sewage sludge is used on the farm for the production of registered crops. No N/A.	Major Must

N°	Control Points	Compliance Criteria	Level
CB 2.3.2	Is organic fertilizer stored in an appropriate manner that reduces the risk of contamination of the environment?	Organic fertilizers shall be stored in a designated area. Appropriate measures, adequate according to the risk assessment in AF 1.2.1, have been taken to prevent the contamination of water sources (e.g., concrete foundation and walls, specially built leak-proof container, etc.) or shall be stored at least 25 meters from water sources.	Minor Must
<b>CB 3</b>	<b>WATER MANAGEMENT</b>		
	<i>Water is a scarce natural resource and irrigation should be designed and planned by appropriate forecasting and/or by technical equipment allowing for the efficient use of irrigation water. For information about responsible water use, see Annex CB 1.</i>		
<b>CB 3.1</b>	<b>Efficient Water Use on Farm</b>		
CB 3.1.1	Identify the impact that current water usage on farm may have on the environment and has it been reviewed by the management within the previous 12 months?	Identify and document the impacts that water sources, the distribution and irrigation system, and crop washing usages may have on the environment. In addition, take into consideration the impact of own farming activities on off-farm environments, where information is known to be available. This shall be reviewed and approved annually by the management. No N/A.	Minor Must
CB 3.1.2	Is there a water management plan available that identifies water sources and measures to ensure the efficiency of application and which management has approved within the previous 12 months?	<p>There is a written and implemented action plan, approved by the management within the previous 12 months, which identifies water sources and measures to ensure efficient use and application.</p> <p>The plan shall include one or more of the following: Maps (see AF 1.1.1), photographs, drawings (hand drawings are acceptable), or other means to identify the location of water source(s), permanent fixtures, and the flow of the water system (including holding systems, reservoirs or any water captured for re-use).</p> <p>Permanent fixtures, including wells, gates, reservoirs, valves, returns, and other above-ground features that make up a complete irrigation system, shall be documented in such a manner as to enable location in the field. The plan shall also assess the need for the maintenance of irrigation equipment.</p> <p>Training and/or retraining of personnel responsible for the oversight or performance duties shall be provided. Short and long-term plans for improvement, with timescales where deficiencies exist, shall be included.</p> <p>This can either be an individual plan or a regional activity that the farm may be participating in or is covered by such activities.</p>	Recom.

N°	Control Points	Compliance Criteria	Level
<b>CB 3.2</b>	<b>Water Quality</b>		
CB 3.2.1	Is the use of treated sewage water in pre-harvest activities justified according to a risk assessment?	<p>Untreated sewage is not used for irrigation/fertigation or other pre-harvest activities.</p> <p>Where treated sewage water or reclaimed water is used, water quality shall comply with the WHO published 'Guidelines for the Safe Use of Wastewater and Excreta in Agriculture and Aquaculture 2006'. Also, when there is reason to believe that the water may be coming from a possibly polluted source (i.e., because of a village upstream, etc.) the producer shall demonstrate through analysis that the water complies with the WHO guideline requirements or the local legislation for irrigation water. No N/A.</p>	Major Must
CB 3.2.2	Are considerations given to water used as part of pre-harvest activities (e.g., irrigation/fertigation, washings, spraying), is it documented and has it been reviewed by the management within the last 12 months?	<p>The following must be documented:</p> <ul style="list-style-type: none"> <li>• Identification of the water sources and their historical testing results (if available)</li> <li>• Method(s) of application</li> <li>• Timing of water use (during crop growth stage)</li> <li>• Contact of water with the crop</li> <li>• Characteristics of the crop and the growth stage</li> <li>• Purity of the water used for PPP applications</li> </ul> <p>PPP must be mixed in water whose quality does not compromise the effectiveness of the application. Any dissolved soil, organic matter or minerals in the water can neutralize the chemicals. For guidance, producers must obtain the required water standards from the product label, the literature provided by the chemical manufacturers, or seek advice from a qualified agronomist.</p> <p>This shall be reviewed by the management every year and updated any time there is a change made to the system or a situation occurs that could introduce an opportunity to contaminate the system. Potential physical (e.g., excessive sediment load, rubbish, plastic bags, bottles) and chemical hazards for the water distribution system must be listed.</p>	Minor Must

N°	Control Points	Compliance Criteria	Level
<b>CB 4</b>	<b>PLANT PROTECTION PRODUCTS</b>		
	<i>In situations where a pest attack will adversely affect the economic value of a crop, it may be necessary to intervene using specific pest control methods, including plant protection products (PPPs). The correct use, handling and storage of PPPs are essential.</i>		
<b>CB 4.1</b>	<b>Choice of Plant Protection Products</b>		
CB 4.1.1	Does the producer only use PPPs that are currently authorized in the country of use for the target crop (i.e., where such an official registration scheme exists)?	All the PPPs applied are officially and currently authorized or permitted by the appropriate governmental organization in the country of application. Where no official registration scheme exists, refer to the guideline on this subject (Annex CB 2) as well as the 'FAO International Code of Conduct on the Distribution and Use of Pesticides'. Refer also to Annex CB 2 for cases where the producer takes part in legal field trials for final approval of PPPs by the local government. No N/A.	Recom.
CB 4.1.2	Is the PPP that has been applied appropriate for the target as recommended on the product label?	All the PPPs applied to the crop are suitable and can be justified (according to label recommendations or official registration body publication) for the pest, disease, weed or target of the PPP intervention. If the producer uses an off-label PPP, there shall be evidence of official approval for use of that PPP on that crop in that country. No N/A.	Minor Must



N°	Control Points	Compliance Criteria	Level
<b>CB 4.2</b>	<b>Records of Application</b>		
CB 4.2.1	Are records of all PPP applications kept and do they include the following minimum criteria: <ul style="list-style-type: none"> <li>• Crop name and/or variety</li> <li>• Application location</li> <li>• Date and end time of application</li> <li>• Product trade name and active ingredient</li> <li>• Pre-harvest interval</li> </ul>	All PPP application records shall specify: <ul style="list-style-type: none"> <li>• The crop and/or variety treated. No N/A.</li> <li>• The geographical area, the name or reference of the farm, and the field, orchard or greenhouse where the crop is located. No N/A.</li> <li>• The exact dates (day/month/year) and end time of the application. The actual date (end date, if applied more than one day) of application shall be recorded. Producers need not record end times, but in these cases, it shall be considered that application was done at the end of the day recorded. No N/A.</li> <li>• The complete trade name (including formulation) and active ingredient or beneficial organism with scientific name. The active ingredient shall be recorded, or it shall be possible to connect the trade name information to the active ingredient. No N/A.</li> <li>• The pre-harvest interval has been recorded for all PPP applications where a pre-harvest interval is stated on the product label or, if not on label, as stated by an official source. No N/A unless Flowers and Ornamentals.</li> </ul>	Major Must
	<b>4.2.2 to 4.2.5:</b> Are records of all plant protection product (PPP) applications kept and do they also include the following criteria:		
CB 4.2.2	Operator?	Full name and/or signature of the responsible operator(s) applying the PPPs shall be recorded. For electronic software systems, measures shall be in place to ensure authenticity of records. If a single individual makes all the applications, it is acceptable to record the operator details only once. If there is a team of workers doing the application, all of them need to be listed in the records. No N/A.	Minor Must
CB 4.2.3	Justification for application?	The name of the pest(s), disease(s) and/or weed(s) treated is documented in all PPP application records. If common names are used, they shall correspond to the names stated on the label. No N/A.	Minor Must
CB 4.2.4	Product quantity applied?	All PPP application records specify the amount of product to be applied in weight or volume or the total quantity of water (or other carrier medium) and dose in g/l or internationally recognized measures for the PPP. No N/A.	Minor Must

N°	Control Points	Compliance Criteria	Level
CB 4.2.5	Application machinery used?	The application machinery type (e.g., knapsack, high volume, U.L.V., via the irrigation system, dusting, fogger, aerial, or another method) for all the PPPs applied (if there are various units, these are identified individually) is detailed in all PPP application records. If it is always the same unit of application machinery (e.g., only 1 boom sprayer), it is acceptable to record the details only once. No N/A.	Minor Must
CB 4.2.6	Does the producer take active measures to prevent pesticide drift to neighboring plots?	The producer shall take active measures to avoid the risk of pesticide drift from own plots to neighboring production areas. This may include, but is not limited to, knowledge of what the neighbors are growing, maintenance of spray equipment, etc.	Recom.
<b>CB 4.3</b>	<b>Pre-Harvest Interval</b> (N/A for Flowers and Ornamentals)		
CB 4.3.1	Have the registered pre-harvest intervals been complied with?	The producer shall demonstrate that all pre-harvest intervals have been complied with for PPPs applied to the crops, through the use of clear records such as PPP application records and crop harvest dates. Specifically in continuous harvesting situations, there are systems in place in the field, orchard or greenhouse (e.g., warning signs, time of application, etc.) to ensure compliance with all pre-harvest intervals. No N/A, unless Flowers and Ornamentals production.	Major Must
<b>CB 4.4</b>	<b>Disposal of Surplus Application Mix</b>		
CB 4.4.1	Is surplus application mix or tank washings disposed of in a way that does not compromise food safety and the environment?	Applying surplus spray and tank washings to the crop is a first priority under the condition that the overall label dose rate is not exceeded. Surplus mix or tank washings shall be disposed of in a manner that does not compromise neither food safety nor the environment. Records are kept. No N/A.	Minor Must

N°	Control Points	Compliance Criteria	Level
<b>CB 4.5</b>	<b>Plant Protection Product Residue Analysis</b> (N/A for Flowers and Ornamentals Production or Plant Propagation Material Production)		
CB 4.5.1	Can the producer demonstrate that information regarding the maximum residue levels (MRLs) of the country(ies) of destination (i.e., market(s) in which the producer intends to trade) is available?	The producer or the producer's customer shall have available a list of current applicable MRLs for all market(s) in which produce is intended to be traded (domestic and/or international). The MRLs shall be identified by either demonstrating communication with clients confirming the intended market(s), or by selecting the specific country(ies) (or group of countries) in which produce is intending to be traded, and presenting evidence of compliance with a residue screening system that meets the current applicable MRLs of that country. Where a group of countries is targeted together for trading, the residue screening system shall meet the strictest current applicable MRLs in the group. Refer to 'Annex CB 3 Guideline CB 4.5 Residue Analysis'.	Major Must
<b>CB 4.6</b>	<b>Plant Protection Product Storage</b>		
The plant protection product (PPP) store must comply with basic rules to ensure safe storage and use.			
CB 4.6.1	Are PPPs stored in accordance with local regulations in a secure place with sufficient facilities for measuring and mixing them, and are they kept in their original package?	<p>The PPP storage facilities shall:</p> <ul style="list-style-type: none"> <li>• Comply with all the appropriate current national, regional and local legislation and regulations</li> <li>• Be kept secure under lock and key. No N/A</li> <li>• Have measuring equipment whose graduation for containers and calibration verification for scales been verified annually by the producer to assure accuracy of mixtures, and are equipped with utensils (e.g., buckets, water supply point, etc.), and they are kept clean for the safe and efficient handling of all PPPs that can be applied. This also applies to the filling/mixing area if this is different. No N/A</li> <li>• Contain the PPPs in their original containers and packs. In the case of breakage only, the new package shall contain all the information of the original label. No N/A.</li> </ul>	Major Must

N°	Control Points	Compliance Criteria	Level
<b>CB 4.6.2 to 4.6.9:</b> Are plant protection products (PPPs) stored in a location that is:			
CB 4.6.2	Sound?	<p>The PPP storage facilities are built in a manner that is structurally sound and robust.</p> <p>Storage capacity shall be appropriate for the highest amount of PPPs that need to be stored during the PPP application season, and the PPPs are stored in a way that is not dangerous for the workers and does not create a risk of cross-contamination between them or with other products. No N/A.</p>	Recom.
CB 4.6.3	Well ventilated (in the case of walk-in storage)?	The PPP storage facilities have sufficient and constant ventilation of fresh air to avoid a build-up of harmful vapors. No N/A.	Minor Must
CB 4.6.4	Located away from other materials?	The minimum requirement is to prevent cross-contamination between PPPs and other surfaces or materials that may enter into contact with the edible part of the crop by the use of a physical barrier (wall, sheeting, etc.). No N/A.	Minor Must
CB 4.6.5	Is the PPP storage facility able to retain spillage?	The PPP storage facilities have retaining tanks or products are banded according to 110% of the volume of the largest container of stored liquid, to ensure that there cannot be any leakage, seepage, or contamination to the exterior of the facility. No N/A.	Minor Must
CB 4.6.6	Is all PPP storage shelving made of non-absorbent material?	The PPP storage facilities are equipped with shelving that is not absorbent in case of spillage (e.g., metal, rigid plastic, or covered with impermeable liner, etc.).	Minor Must
CB 4.6.7	Are keys and access to the PPP storage facility limited to workers with formal training in the handling of PPPs?	The PPP storage facilities are kept locked and physical access is only granted in the presence of persons who can demonstrate formal training in the safe handling and use of PPPs. No N/A.	Minor Must
CB 4.6.8	Are liquids not stored on shelves above powders?	All the PPPs that are liquid formulations are stored on shelving that is never above those products that are powder or granular formulations. No N/A.	Minor Must
CB 4.6.9	Are PPPs approved for use on the crops registered for the PFA standard stored separately within the storage facility from PPPs used for other purposes?	PPP's used for purposes other than for registered crops (i.e., use in garden, etc.) are clearly identified and stored separately in the PPP store.	Minor Must

N°	Control Points	Compliance Criteria	Level
<b>CB 4.7</b>	<b>Plant Protection Product Handling</b> (N/A if no Plant Protection Product Handling)		
CB 4.7.1	When mixing PPPs, are the correct handling and filling procedures followed as stated on the label?	Facilities, including appropriate measuring equipment, shall be adequate for mixing PPPs, so that the correct handling and filling procedures, as stated on the label, can be followed. No N/A.	Minor Must
<b>CB 4.8</b>	<b>Empty Plant Protection Product Containers</b>		
CB 4.8.1	Is re-use of empty PPP containers for purposes other than containing and transporting the identical product being avoided?	There is evidence that empty PPP containers have not been or currently are not being re-used for anything other than containing and transporting identical product as stated on the original label. No N/A.	Minor Must
CB 4.8.2	Are empty containers kept secure until disposal is possible?	There is a designated secure store point for all empty PPP containers prior to disposal that is isolated from the crop and packaging materials (i.e., permanently marked via signage and locked, with physically restricted access for persons and fauna).	Minor Must
CB 4.8.3	Does disposal of empty PPP containers occur in a manner that avoids exposure to humans and contamination of the environment?	Producers shall dispose of empty PPP containers using a secure storage point, a safe handling system prior to the disposal, and a disposal method that complies with applicable legislation and avoids exposure to people and the contamination of the environment (watercourses, flora, and fauna). No N/A.	Minor Must

N°	Control Points	Compliance Criteria	Level
<b>CB 5</b>	<b>EQUIPMENT</b>		
CB 5.1	Is equipment sensitive to food safety (e.g., PPP sprayers, irrigation/fertigation equipment, post-harvest product application equipment) maintained in a good state of repair, routinely verified and, where applicable, calibrated at least annually, and are records of measures taken within the previous 12 months available?	<p>The equipment is kept in a good state of repair with documented evidence of up-to-date maintenance sheets for all repairs, oil changes, etc. undertaken. E.g., PPP sprayers: See Annex CB 4 for guidance on compliance with visual inspection and functional tests of application equipment. The calibration of the PPP application machinery (automatic and non-automatic) has been verified for correct operation within the last 12 months and this is certified or documented either by participation in an official scheme (where it exists) or by having been carried out by a person who can demonstrate their competence.</p> <p>If small handheld measures not individually identifiable are used, then their average capacity has been verified and documented, with all such items in use having been compared to a standard measure at least annually.</p> <p>Irrigation/fertigation equipment: As a minimum, annual maintenance records shall be kept for all methods of irrigation/fertigation machinery/techniques used.</p>	Minor Must

## ANNEX CB 1 GUIDELINE: RESPONSIBLE ON-FARM WATER MANAGEMENT FOR CROPS

### 1. INTRODUCTION TO THE GUIDANCE DOCUMENT

*This is a GUIDELINE. Where examples are supplied, the lists are not exhaustive, but provide sufficient guidance to producers to design a risk assessment, develop a farm-specific water management plan, and implement good practices .*

Water is one of the main basic raw materials needed to produce food. Fresh water resources have become scarce in more and more regions. Water allocation is becoming a complex issue, especially in certain regions and for certain uses. Managing water requires specific knowledge, skills and improved planning, for example, to react in times of water scarcity. Clean and sufficient water is important for human health, the health of our ecosystems, and for global economic growth and development. To achieve this, good on-farm practices are required, as the agricultural sector is one of the major users of fresh water resources.

This guidance document is designed to support growers seeking assessment and to make them aware that the control points and compliance criteria (CPCC) regarding responsible water management have been upgraded. This document helps growers understand the requirements that must be fulfilled in order to achieve compliance.

The document is intended to help growers carry out and comply with some of the new and more complicated tasks or requirements concerning water use, such as performing a risk analysis and drafting a water management plan. This guidance document attempts to identify all the relevant factors that need to be considered and/or the measures that need to be implemented in order to ensure that responsible water management takes place on the farm.

This guidance document is not a manual for agronomists or academics—it does not fully illustrate and discusses on-farm water management according to theoretical or applied science. It is designed to be a practical document to help producers, persons responsible for irrigation on farms, auditors, consultants, members of GLOBALG.A.P., and others to develop an integrated understanding of good practices for on-farm water management.

### 2. RESPONSIBLE ON-FARM WATER MANAGEMENT

This section elaborates on good practices to improve on-farm water management. The focus is on reducing direct and indirect contamination of water bodies from agricultural fields by introducing good water management practices on the farm. These practices will also help to improve the efficient and safe use of water resources to grow crops.

The recommended good practices for water management described in this section are at farm level and mainly focus on:

- **The day-to-day management of irrigation and soil** (e.g., avoiding over-irrigation, leaching, excessive drainage and agricultural runoff, reducing soil erosion, improving soil fertility, etc.)
- **The use of crop protection products** (i.e., the use of insecticides, fungicides and/or herbicides)
- **The application of crop nutrition** (i.e., the application of fertilizers and organic soil amendments such as manure)
- **Waste management** (e.g., the management of spray tank leftovers, the disposal of empty PPP containers, etc.)

## 2.1 Definition of Responsible On-Farm Water Management

The following characterizes sustainable and responsible water management at farm level:

- The farm management has a proper overview of all the water sources surrounding the farm. This includes identifying the sources that are used for extraction, how much water is extracted and when, and having an overview of the farm water distribution system.
- The farm uses water resources in an efficient and planned manner for irrigating crops.
- The irrigation water quality is controlled.
- There is control over the possible return of wastewater from the farm back into water bodies.
- There is proper handling and use of PPPs, fertilizers and organic soil amendments (correct time, place and amount of application).
- Good soil management practices are in place (to prevent soil erosion, improve the water retaining capacity of the soil and as such prevent water pollution by surface runoff, subsurface runoff and drainage).

## 2.2 Water Quality

The *three* main sources of water contamination in agriculture are chemical (i.e., nutrients, such as nitrates, phosphates, and agrochemicals), physical (e.g., soil, stones, glass) and microbial.

The main potential pollutants from agricultural fields are PPPs and nutrients.

If organic and inorganic fertilizers end up in surface waters in excessive quantities, this can cause eutrophication of waters bodies.

It is important to handle and use *PPPs* and *fertilizers* according to their registered uses, while following recommended best practices to prevent them from transferring to other parts of the environment, notably vulnerable areas such as drinking water sourcing areas.

It is important to consider that microbial contamination of irrigation water, for example **with organic manures**, can impact food safety. In this case, the quality of irrigation water is critically important and shall be controlled regularly (See Annex FV 1 for risks associated with microbial contamination of water).

### *Direct and Indirect Contamination*

- Direct (also known as point source) contamination refers to clearly identifiable sources of contamination, for example spills of PPPs made during mixing and loading of the sprayer or the disposal of tank leftovers fields without properly diluting the mixture and/or without taking into account adjacent water bodies.

By contrast, indirect (also known as diffuse source) contamination is distributed at various locations around the farm and fields. Transfer routes from indirect sources include runoff, drainage, leaching and spray drift. The prevention of indirect source contamination is more complicated than the prevention of direct contamination. Preventing indirect source contamination often involves changing agricultural practices in the field, such as introducing:

- Vegetative buffers at the edges of cropped fields



- Crop rotation with more diverse crops, and other cropping practices that improve soil organic matter and prevent erosion
- Contour cropping
- Minimum tillage
- Better irrigation scheduling and intensities
- Low-drift spray nozzles, careful calibration of spray equipment, etc.

It is important to assess whether direct contamination occurs at the farm and to identify the main areas of risk. This will enable plans to be put in place to ensure that risks are reduced.

These plans include, for example, careful management of PPPs to avoid contamination of water bodies and sources. Keeping records of PPP use is important as well as implementing recommended good practices, which, for example, include proper storage rooms, contained areas for sprayer mixing and loading, the management of spills and tank leftovers, and the collection and safe disposal of contaminated wastewater.

It is more complicated to determine whether there is indirect contamination from agricultural fields and if so to identify the main triggers. This requires an assessment of the fields. For example, visible erosion in the form of tramlines indicates the occurrence of surface runoff. This may be caused by poor infiltration capacity of the soil due to poor soil management practices (e.g., deep plowing, no crop rotation and/or the absence of a proper farm traffic plan). It is more difficult to assess whether the fields are susceptible to leaching of agrochemicals. Local farm advisers or farm service providers can support producers in assessing the risk of agricultural runoff, leaching, drainage and drift from agricultural fields.

According to the type and source of contamination, tailored mitigation measures and best management practices can be implemented. The most important mitigation measure is the correct management of plant protection product (PPP) applications, i.e., the right time, place and amount. It is important to keep track of the weather forecast. Applying (PPPs) before a heavy shower can increase the risk of agricultural runoff and/or leaching and as such contaminate water bodies.

### 2.3 Water Quantity

There are 3 sources of water:

- Groundwater: Water that is captured and stored naturally under the soil. Renewable groundwater is stored in underground aquifers, which are recharged in the short term by rainfall. Fossil groundwater is stored in deeper aquifers, which are not recharged by rainfall.
- Surface water: Fresh water in lakes, rivers, natural and artificial ponds, and ditches.
- Captured water: Water stored by dams or captured in artificial basins.

Unsustainable (over)extraction of water from groundwater aquifers can cause a drop in the groundwater table. Lower groundwater tables impact not only the producers, as they will have to drill deeper to extract groundwater, but also the wider community. It can also cause the intrusion of salt water into freshwater aquifers in regions located close to the sea.

Reducing the consumption of water for irrigation by a more efficient use (and thus less wastefully) is good practice for producers. This can be achieved by better irrigation management through timely applications of the correct amount of water the crops need. It can also be achieved through better soil management, for example, by increasing the soil water retaining capacity by increasing the organic matter content, or investing in mulching. Some crop varieties also use water more optimally. The efficient use of water for irrigation also does not impact crop yields if planned properly, for example by avoiding water stress (e.g., by using soil moisture probes).

## 2.4 Irrigation Methods

Irrigation methods can generally be divided into 3 types:

- 1) Surface irrigation
- 2) Sprinkler irrigation
- 3) Drip irrigation

Each of these methods impacts water quality and quantity in different ways. The choice of using a certain irrigation method depends on the crop, the soil, the producer's ability to invest in irrigation and/or get support from local authorities in irrigation systems, as well as long-standing irrigation practices in the case of traditional irrigation systems.

### Surface Irrigation

There are different types of surface irrigation systems: flood, basin, border or furrow irrigation. There is a greater risk of water contamination in the case of surface irrigation due to the reduced control producers have on the application of water to the crops. For example, flood irrigation brings a larger risk of leaching and drainage. Furrow irrigation also increases the risk of runoff at the tail end of the field, if not managed effectively. Surface irrigation systems are considered to have a low irrigation efficiency (IE) or water use efficiency (WUE) due to high evaporative losses as compared to sprinkler and drip irrigation systems.

### Sprinkler Irrigation

Sprinkler irrigation systems can irrigate large fields and are in most cases replaceable. They are often used when irrigation is not a steady need but required in exceptional circumstances such as dry periods. There are different sprinkler irrigation methods, such as micro-sprinklers, central pivot irrigation systems, laterals, and gun and boom systems. Sprinkler irrigation systems are pressurized irrigation systems and thus need energy to function. The main disadvantage of sprinkler irrigation systems (aside from the high cost) is the evaporative loss of water. This makes the timing of irrigation critical; for example, irrigation at mid-day will increase losses by evaporation.

### Drip Irrigation

Like sprinkler irrigation systems, drip irrigation systems are pressurized and thus make use of energy only when functional (some more than others depending on topographical differences and thus the need to pump water). These systems are popular due to their ease of use and high IE or WUE. Water loss, i.e., evaporative losses or other non-beneficial uses, is minimal. Drip irrigation systems are considered to be the preferred solution in arid and semi-arid regions. However, having drip irrigation in place does not by definition mean that water is used efficiently, and that water is being saved. Good management practices need to be implemented to ensure that on-farm irrigation does not impact water availability to other users in the catchment or river basin (this includes the need for water for healthy ecosystems).

## 2.5 Water-Related Practices in Rain-Fed Agriculture

Good soil management to improve the infiltration of precipitation in the topsoil and increase the soil's water holding capacity is very important in both irrigated and rain-fed agriculture, as this prevents agricultural runoff or drainage from agricultural fields. Moreover, better retention of available water in the soil allows crops to consume more water, which can improve crop biomass and yields in rain-fed agriculture in arid and semi-arid regions. Increasing soil organic matter content is critical in raising the soil's water-holding capacity.

To improve water quantity management, tools can be put into place to store excess precipitation, which can be used in periods of water stress. Precipitation can be stored by collecting water from roofs or by storing water in reservoirs built in areas that are not cultivated.

## 2.6 Good Practices for Water Management

The following are examples of practices that may be implemented to ensure responsible on-farm water management:

### 2.6.1 Water Quality

- Test the quality of irrigation water and monitor, where possible, the amount of effluent entering water bodies from agricultural fields at accurate intervals.
- Preferably mix and load the sprayer on a concrete/impermeable area at the farm within a safe distance from streams, ditches, wells, food and feed storage rooms, residential areas and roads. Make sure that the area has a small depression that leads possible spills and wastewater from washing the sprayer and the nozzles into an artificial drain for collection and safe disposal. The collected effluent and any remnants, such as tank leftovers, can be sent off for disposal to authorized waste disposal companies or treated at the farm using an effluent management system.
- Areas used for mixing and loading the sprayer must not be located in the vicinity of irrigation storage reservoirs.
- Use the correct irrigation method based on crop, soil, climate and slope to prevent erosion, leaching, evaporative losses and agricultural runoff.
- Improving topsoil permeability can also reduce agricultural runoff. This can be done, for example, by preventing capping or compaction of the soil, introducing controlled farm traffic, and improving soil structure by applying minimum tillage or no till if the soil and other circumstances allow this.
- Agricultural runoff can further be prevented from directly entering surface water bodies by installing buffers next to streams. This will protect surface water bodies from agrochemicals or nutrients that may run off the fields due to precipitation or irrigation.
- Do not irrigate with surface or groundwater if it is contaminated (e.g., microbial, heavy metals, industrial pollutants, etc.).
- If irrigation water is recycled through a drainage system, check that the following crops are not sensitive to herbicides in water even when very low concentrations (this information is normally provided on the label about sensitivities of following crops).
- Do not use PPPs with a high leaching potential (the label will normally state this), if the groundwater table is very close to the surface and the soil is vulnerable to leaching (high drainage rate, coarse texture (sandy) or heavier textures with extensive cracks/worm channels, and low organic matter levels).
- Ensure that oil from tractors is not disposed of in ditches.
- Adhere to all local laws and bylaws regarding water quality (management).

### Surface Irrigation Systems

- For crops treated with agrochemicals, ensure that border, basin or furrow irrigation is delayed for a few days after applications. In the case of furrow irrigation or when the borders are relatively small, 'surge irrigation' can be applied to allow for better infiltration of water into the soil avoiding runoff at the tail ends.
- Avoid irrigating with water that contains a high level of industrial effluents or grey water/black water, e.g., water from untreated sewage, or treated sewage high in heavy metals. This can have adverse effects on human health (both operators and consumers of the crops) and soils.

### Sprinkler and Drip Irrigation Systems

- If crop protection is applied through chemigation, drip irrigation systems should be thoroughly checked because clogging can cause damage to the system and the nozzles, which may lead to leaks.
- If chemigation is applied, use high quality and strong materials for drip lines. Also make sure that the permanent drip irrigation systems (such as in orchards) are equipped with back-flow prevention devices, which stop water from flowing back into reservoirs and thus contaminating larger amounts of water.
- The differences in wetting area and crop root volumes must be kept minimal to prevent leaching.

### 2.6.2 Water Quantity

- Comply with national and international legislation concerning water quantity management and related good practices, if available
- Adhere to all local laws and bylaws regarding water abstraction
- Maintain the correct irrigation rate and intervals depending on crop needs, soil type, and water availability. The latter is important because in the case of serious water shortages or water scarcity, one can choose to apply deficit irrigation, i.e., applying water during the most critical growth stages of the crops, such as flowering, to prevent yield loss.
- Always avoid over-irrigation to prevent leaching, agricultural runoff, and drainage.
- Minimize evaporative losses, for example, from open water surfaces
- When using groundwater for irrigation, use it sustainably. This means not extracting more than the yearly recharge rate to avoid a drop in the groundwater table.
- Maintain a correct irrigation application rate depending on the crop, the growth stage, the availability of water, and the crop water requirements, which also depend on the weather conditions (heat and amount of precipitation).
- Advice on the correct irrigation application rates during the season is available from water user associations, local water management authorities or from private service providers. Growers can also estimate correct irrigation application rates themselves if tools such as soil moisture probes are available.
- Timely maintenance of the irrigation system is important to reduce leaks and improve IE or WUE.
- Increase the soil's water holding capacity, reduce agricultural runoff, leaching, and prevent soil erosion. The soil's water holding capacity can be improved by increasing soil organic matter. Conservation agriculture, which includes minimum tillage or no tillage, helps improve soil organic matter depending on the local circumstances, e.g., soil type, climate, etc.
- Monitor and document water usage

### Surface Irrigation Systems

- Improve conveyance and application efficiencies where needed and possible. If return flows have clearly proven to be useful for downstream users and if this does not financially impact the producer, allow these return flows to occur and avoid recapturing these flows for re-use in the irrigation system.
- Maintain proper design of the irrigation system, i.e., the size of flood basins, the distribution of gates, the length of furrows, etc.

### Sprinkler and Drip Irrigation Systems

- Use good quality drip lines to prevent damage and leaks.
- Use water optimally by ensuring the correct wetting pattern, i.e., avoid too much overlap of wetted circles around drippers or sprinklers.
- Drip irrigation: Use correct sized pipes and maintain equal pressure on all plots of a culture, etc.

## 3. GUIDANCE ON THE CONTROL POINTS AND COMPLIANCE CRITERIA (CPCC) FOR ON-FARM RESPONSIBLE WATER MANAGEMENT

This section provides guidance on what to consider in order to ensure that a more sustainable and responsible management of water is taking place on the farm, and to fulfill the requirements of Primary Farm Assurance (PFA). This is particularly important in regions where water resources are scarce.

**CB 5.2.1 Irrigation/Fertigation Management (IFA)** (CB 3.1.1 in terms of PFA standard, however only the potential environmental impact of water usage on farm is to be documented. Below is the GLOBALG.A.P. IFA guidance)

<b>Control Point</b>	<b>Compliance Criterion</b>	<b>Level</b>
<i>Has a risk assessment been undertaken that evaluates environmental issues for water management on the farm, and has it been reviewed by the management within the previous 12 months?</i>	<i>There is a documented risk assessment that identifies environmental impacts of the water sources, distribution system and irrigation and crop washing usages. In addition, the risk assessment shall take into consideration the impact of own farming activities on off-farm environments, where information is known to be available. The risk assessment shall be completed, fully implemented and it shall be reviewed and approved annually by the management. See 'Annex AF 1 GLOBALG.A.P. Guideline: Risk Assessment – General' and 'Annex CB 1 GLOBALG.A.P. Guideline: Responsible On-Farm Water Management' for Crops' for further guidance. No N/A.</i>	<i>Major Must (obligatory as Major Must from 1 July 2017)</i>

**Guidance:**

A documented risk assessment should identify the relevant food safety and environmental impacts of on-farm water use. This includes risks concerning the potential contamination of water (water quality) as well as the over-use of water (water quantity) as explained in the introductory sections of this guidance document.

For this purpose, you should assess the way in which water is used and identify any activities that could result in the inefficient and wasteful use of water, as well as opportunities for more efficient water use. Issues such as over-irrigation or the use of wastewater for irrigation should be addressed.

Farm water sources and distribution systems shall be described to help identify potential sources and opportunities for contamination. The risk assessment will provide guidance on how to best manage possible direct and indirect sources of contamination.

The risk assessment shall be reviewed and approved annually by the farm management.

See Annex AF 1 of the GLOBALG.A.P. Integrated Farm Assurance (IFA) CPCC document for further guidance on how to perform an on-farm risk assessment.

The risk assessment shall be updated annually and be farm-specific.

Any format can be used, but with strong reference to the guidance provided in Annex AF 1, and taking into consideration the following main elements:

**1. Food Safety:**

Specific risk analysis on food safety according to CPCC CB 5.3.2 (IFA).

Please see the annexes on risks associated with on-farm microbiological contamination of water for more detail.

**2. Environment**

**Water Source:**

The risk assessment shall address the water sources on and surrounding the farm and the specific use of the water.

- Describe the sources and distribution systems of water used on the farm.
- Describe any natural or man-made water bodies on the farm.
- Does the water source contain debris and/or sediment?
- Is there national legislation that stipulates maximum allowed residue levels of PPPs and nutrients in groundwater and surface water levels?
- Compile a list of pesticides applied on the fields, including the location on the farm, method of application, the target crop, time of application, dose rate.
- Compile a list of fertilizers and organic amendments applied on the fields, including the location on the farm, method of application, target crop, time of application and dose rate.
- Maximum allowed residue levels of PPPs and nutrients in groundwater and surface water levels according to national legislation

**Permits and Licenses Needed:**

- Are permits or licenses needed in order to extract and store groundwater or surface water (for example from rivers, lakes, streams or ditches on or near the farm?)
- Quantities of water within legal limitations: Are there any restrictions concerning water use from local authorities or irrigation schemes to which the producer belongs?
- Permits for all installations: Are permits needed for wells, pumping stations, storage basins, and distribution systems?

**Water Use:**

- Identify all uses of water on the farm.
- Identify activities that could result in wastage and over-use of water (e.g., leakage from water distribution systems, poorly maintained irrigation equipment, inefficient irrigation).

**Water Quality**

- Identify activities that could be potential sources of contamination of water bodies (streams, ponds, etc.) and water sources. This includes disposal of wastewater, spray-tank washings and leftovers, use of agrochemicals (pesticides, organic/inorganic fertilizers).
- Identify locations where wastewater and spray-tank leftovers are disposed of, and their proximity to water sources.
- Identify locations where the use of plant protection chemicals could contaminate water bodies and sources through runoff or spray drift.
- Identify locations where the use of organic or inorganic manure could contaminate water bodies and sources through runoff (e.g., where there is close proximity to water, or where land is steep).
- Does or could the use of water by the farm cause agricultural runoff containing PPPs, nutrients or hazardous contaminants?

### CB 3.1.2 Irrigation/Fertigation Management

<b>Control Point</b>	<b>Compliance Criterion</b>	<b>Level</b>
<p><i>Is there a water management plan available that identifies water sources and measures to ensure the efficiency of application and which management has approved within the previous 12 months?</i></p>	<p><i>There is a written and implemented action plan that identifies water sources and measures to ensure efficient use and application, which has been approved by the farm management within the previous 12 months.</i></p> <p><i>The plan shall include one or more of the following: maps (see AF 1.1.1), photographs, drawings (hand drawings are acceptable) or other means to identify the location of water source(s), permanent fixtures and the flow of the water system (including holding systems, reservoirs or any water captured for re-use).</i></p> <p><i>Permanent fixtures, including wells, gates, reservoirs, valves, returns and other above-ground features that make up a complete irrigation system, shall be documented in such a manner as to enable location in the field. The plan shall also assess the need for the maintenance of irrigation equipment. Training and/or retraining of personnel responsible for the oversight or performance duties shall be provided. Short and long-term plans for improvement, with timescales where deficiencies exist, shall be included. This can either be an individual plan or a regional activity that the farm may participating in or is covered by such activities.</i></p>	<p><i>Recom.</i></p>

**Guidance:**

A written on-farm water management plan will help assess current practices on the farm and identify practices that may need to be changed or optimized to improve overall on-farm water use and water quality management. Such a plan needs to be approved by the farm manager and be reviewed each year.

Each on-farm water management plan should provide a description of which measures are in place or will be put into place. These measures should address the efficient use of water resources as well as the prevention of contamination of water bodies. The plan shall be formulated based on the risk assessment. It shall include factors to mitigate the risks identified in the risk assessment, and include training for producers and workers to ensure proper implementation.

Short and long-term plans for improvement, with timescales where appropriate, shall be included. This plan can either be an individual plan or a regional activity that the farm may be participating in or is covered by such activities.



The following are recommended good practices that can help to improve water management on the farm:

**Sustainable Soil and Crop Management Practices**

- Implement practices such as conservation agriculture, mulching, controlled traffic, crop rotation and planting of cover crops. These can reduce agricultural runoff and thus possible contamination of surface water bodies.
- Improve the soil organic matter content.
- Choose crop varieties that use water optimally (perhaps with specific features to optimize water use).

**Losses:**

- Prevent water loss in the irrigation system, for example, that occur through leaks.
- Prevent leaks through effective maintenance of the irrigation system.
- Use well designed basins, pipes, and pumps to avoid losses.

**Evaporative Losses:**

- Prevent substantial evaporative losses in the irrigation.
- Attempt to avoid such losses by measuring or estimating them.

**Irrigation Interval:**

- Ensure irrigation intervals are well managed to ensure efficiency.
- Take into account precipitation events and the soil moisture content to calculate the required irrigation interval and irrigation application rate.
- Be flexible and reactive in adjusting the irrigation interval according to changing crop water requirements.

**Pressure Management in Hydrants:**

- In the case of pressurized irrigation systems (i.e., sprinkler and drip irrigation systems), ensure a correct homogeneous pressure is maintained in all hydrants and on all plots to optimize the distribution of irrigation and thus avoid over- and under-irrigation.

**Downstream shortages:**

- Consider if the use of water by the farm could cause water shortages downstream.

It is recommended to include the following aspects into the on-farm water management plan:

1. Measure water use for all on-farm water extraction and distribution infrastructure such as:
  - All groundwater wells used for irrigation (m3/month, m3/year)

- All intakes from streams or ditches (m<sup>3</sup>/month, m<sup>3</sup>/year)
  - All irrigation infrastructures such as water distribution pipes or channels
  - Main, secondary and tertiary irrigation channels and gates in the case of surface irrigation water pumps (capacity m<sup>3</sup>/ha)
  - All hydrants in case of a pressurized irrigation system
  - All reservoirs either used for irrigation or used to capture precipitation
  - All water harvesting constructions.
2. Fixed constructions on the farm should be mapped. The map may also include the larger water bodies outside the farm if there are any close to the fields.
  3. Mention whether the distribution of water to/on the farm is centrally managed, for example, through a water user association, or whether water is extracted individually by using a private well or pumped from adjacent streams and ditches.
  4. Include data on crops and water use: Measure/estimate how much water has been applied on the field (m<sup>3</sup>/ha/month/crop, m<sup>3</sup>/ha/year/crop). Review and explain the methods used to calculate this.
  5. If possible and relevant to the irrigation method used (e.g., drip irrigation systems, etc.), include irrigation system efficiency data, such as the conveyance (efficiency of water transport in irrigation canals or through irrigation pipes, which is a function of canal/pipe length, canal characteristics (e.g., earthen or lined canals), soil type and system maintenance. This can be determined using widely available estimation tables (measured in %) and application efficiencies (the volume of water added to the root zone divided by the volume of water applied to the field (measured in %)), which will help in assessing and improving the efficiency of the irrigation infrastructure.
  6. Indicate how crop water requirements (CWR) are calculated. Also, include the irrigation intervals and length of irrigation cycles. Optimal intervals and cycle lengths should be maintained. For example, in the case of furrow-irrigated fields, surge flow can significantly improve irrigation uniformity and beneficial uptake of the water by crops. Temperature can also trigger differences in intervals (e.g., larger intervals when lower temperatures and thus a reduced need for crop evapotranspiration).
  7. Maintenance: It is important to have a plan in place for the maintenance of the irrigation system and of farm machinery:
    - Indicate how often the fixed water extraction and distribution infrastructure are maintained and/or repaired and who is responsible for it.
    - Address whether there is proper pressure management for optimal design flow through the drip and sprinkler irrigation systems.
    - There should be a plan in place in case emergency maintenance is required.
    - The persons who carry out the maintenance shall be properly trained to do so.
    - Records should be available of when the maintenance was done, by whom and on what, e.g., what has been repaired?
  8. Surface irrigation systems: Address whether surface irrigation systems are designed to make optimal use of gravity to minimize the use of pumps and consequently the energy use.
  9. Direct and indirect sources of contamination: The plan should outline any measures put in place to mitigate the risks related to direct and indirect sources of water contamination identified in the risk assessment. It needs to address issues such as potential spillage from the crop protection mixing area, and sprayer loading and cleaning area, as well as contamination due to agricultural runoff, leaching and/or drainage.

10. Fertigation and/or chemigation: If fertigation and/or chemigation activities are maintained these need to be outlined, e.g., how much is applied, are drip irrigation systems used for fertigation/chemigation, etc.? Measures to mitigate any risks of contamination of water bodies and/or sources identified in the risk assessment should be outlined (e.g., avoiding applications on or near water, especially on sloping land; use of techniques to reduce runoff such as contour planting).
11. Climate data: Add information concerning the precipitation and temperature and, if possible, the reference evapotranspiration (if this information is available) throughout the year to make informed decisions on irrigated agriculture. Indicate if this information is easily accessible.
12. Training: The plan shall assess who needs training and in which topics. Training may be required to draft/implement a comprehensive water management plan, including logbooks, as well as on record keeping. Growers, technicians and farm workers may also need basic training in on-farm water quality management; the management, maintenance and operation of irrigation systems; and water quantity management. Growers, technicians and farm workers should be aware of the management plan and its goals.

Basic training on the following is recommended to assist the farm in implementing good water management practices:

- The control of water quality.
  - Safe use of pesticides on the farm and how to handle the sprayer and spray solutions/remnants.
  - Management of the soil to maintain soil organic matter, improve infiltration capacity, improve soil water retaining capacity, and prevent erosion.
  - Calculating the crop water requirements to make informed decisions about when to irrigate, what the irrigation interval should be, whether deficit irrigation can be applied in times of need, etc.
13. Untreated sewage: The plan should take note of the fact that untreated sewage shall not be used for fertigation or irrigation. This point is covered under CB 2.3.1 and CB 3.2.1.
  14. Record keeping: The guidance on record keeping is provided under AF 2.
  15. Water use permits and licenses: The plan should make reference to all local regulations, by-laws and irrigation scheme rules concerning water extraction and use. The plan should ensure that all necessary licenses and permits have been obtained, and are up-to-date, and are complied with. It should include details on all records that need to be kept in order to ensure and demonstrate that all relevant licenses, by-laws, and regulations are complied with.

Permits may be required for putting into place new water storage infrastructure and for the on-farm use of the captured or stored water. For example, local water harvesting and storing of precipitation shall not impact users elsewhere in the catchment area.

The plan must make reference to any local laws or by-laws concerning the correct disposal of wastewater, and indicate how they will be complied with, as well as any relevant records that need to be kept.

This requirement is the object of two control points and is further examined under CB 5.4.1 and 5.4.2 in IFA.

16. Predicting irrigation water use: This specific requirement is based on CPCC CB 5.1.1 in IFA.

## Glossary

**Aquifer:** An aquifer is an underground layer of water-bearing, permeable rock consolidated materials (gravel, sand or silt), from which groundwater can be extracted using a water well.

**Black water:** Water polluted with food, animal, or human waste (source: online dictionary).

**Chemical contamination:** Soils and aquifers can be contaminated by irrigation water containing chemical contaminants, such as (PPPs) and heavy metals, in quantities above the legal limits.

**Chemical status of soil:** Chemical characteristics of a soil (affected by mineral composition, organic matter and environmental factors).

**Chemigation:** Chemigation is the name for the injection of chemicals such as nitrogen, phosphorus or a pesticide into irrigation water that is then applied to the land using the irrigation system.

**Contaminants, contamination:** This may be microbial contamination (through microorganisms such as bacteria, virus, yeast) or chemical contamination (through chemicals such as heavy metals or agrochemicals).

**Control points:** Questions in the checklist of PFA that have to be answered positively. There are two types of control points: Major and Minor.

**Contour cropping:** A farming practice of plowing and/or planting across a slope following its elevation contour lines. These lines create a water break, which reduces the formation of rills and gullies during times of heavy water run-off (a major cause of topsoil loss and soil erosion). The water break also allows more time for the water to settle into the soil. In contour plowing, the ruts made by the plough run perpendicular rather than parallel to slopes, generally resulting in furrows that curve around the land and are level. This method is also known for preventing tillage erosion. (Source: Wikipedia)

**Compliance criteria:** Normative elements attached to every Control Point and indicating the criteria to have the control point fulfilled

**Crop water requirements (CWR):** This is the crop evapotranspiration, which is a function of the crop coefficient (depending on the crop characteristics and evaporation from the soil) and the evapotranspiration.

**Diffuse source contamination:** In contrast to point source contamination, it describes sources of contamination disseminated among various locations of farms and fields.

**Downstream shortages:** Water shortages downstream caused by the use of water by a farm

**Drip irrigation:** Drip irrigation is an irrigation method that uses drip lines and emitters (or mini-sprinklers) for the localized delivery of water to the crop. In drip irrigation systems water is distributed from a storage basin through a pressurized distribution system to the fields.

**Eutrophication:** A process where water bodies receive excess nutrients that stimulate excessive plant growth. (source: USGS 2014)

**Fertigation:** Application of fertilizers, soil amendments or other water-soluble products through an irrigation system. (source: Wikipedia)

**Fossil water:** Water that has been infiltrated usually millennia ago and often under climatic conditions different to the present, and that has been stored underground since that time. This water has no or minimal contacts with the outer world and no, or only minimal recharge.

**Furrow irrigation:** Furrow irrigation is a surface irrigation system in which water is delivered in small, long streams to crops that are grown on ridges. Furrow irrigation systems are gravity led.

**Grey water:** Wastewater generated from hand-wash basins, showers and baths, which can be recycled on-site for uses such as toilet flushing, landscape irrigation and constructed wetlands. (source: Wikipedia)

**Irrigation:** Artificial application of water to the land or soil. It is used to assist in the growing of agricultural crops, maintenance of landscapes, and re-vegetation of disturbed soils in dry areas and during periods of inadequate rainfall. Additionally, irrigation also has a few other uses in crop production, which include protecting plants against frost, suppressing weed growth in grain fields, and preventing soil consolidation. By contrast, agriculture that relies only on direct rainfall is referred to as rain-fed or dryland farming.

**Irrigation efficiency (IE):** Terminology used for engineering irrigation systems and consists of the application efficiency (ea) and conveyance efficiency (ec) of the irrigation system ( $IE = ea * ec/100$ ).

**Microbial contamination:** By water containing microbes in quantities above the legal limits.

**Major control points:** All Major control points must be fulfilled to achieve PFA compliance.

**Minor control points:** 95% of the minor control points must be fulfilled to achieve PFA compliance.

**Minimum tillage:** A conservation agriculture technique where the grower works 10 to 15 centimeter of the topsoil using minimum tillage machinery to allow for minimum disturbance of the soil so as to improve soil structure over time.

**Point source contamination:** This refers to clearly identifiable sources of contamination, for example spills of PPPs made during mixing and loading of the sprayer or the disposal of tank leftovers on the fields without properly diluting the mixture and/or without taking into account adjacent water bodies.

**Plant protection products (PPP):** Insecticides, fungicides, and herbicides

**Pressurized irrigation:** Sprinkler and drip irrigation are pressurized irrigation systems requiring energy to distribute the water.

**(Agricultural) Return flow:** The (agricultural) return flow is the amount of water that flows back to water bodies downstream after being used on agricultural fields—thus the amount of water that has not been consumed.

**River discharge:** The flow of water through the river in m<sup>3</sup>/s.

**Surface irrigation:** Surface irrigation systems comprise open channels in which water is distributed by gravity to field units and controlled by gates which are adjusted by the local irrigation system management authorities.

**Sprinkler irrigation:** An irrigation method that uses different sprinklers (travelling sprinklers, pivot systems, gun and boom, etc.) for the localized delivery of water to the crop. In sprinkler irrigation systems water is distributed from a storage basin through a pressurized distribution system to the fields.

**Surge flow:** Irrigation water is applied to furrows in a number of intervals to allow the applied water drain into the topsoil in the first parts of the furrow and reduce infiltration in these parts when applying the second time. This allows for an improved uniformity of irrigation water applied in the furrow-irrigated system.

**Surge irrigation:** Irrigation is not applied at once, but in surges or cycles that allow water to infiltrate in the soil at the head end of the furrow or border. A second surge of irrigation will allow water to move or advance further to the areas that have not received irrigation yet, reducing the potential for runoff at the tail end of the furrow or border.

**Water body:** The term most often refers to large accumulations of water, such as oceans, seas, and lakes, but it includes smaller pools of water such as ponds, wetlands, or more rarely, puddles. A body of water does not have to be still or contained—rivers, streams, canals, and other geographical features where water moves from one place to another are also considered bodies of water. (source: Wikipedia)

**Water harvesting:** Collecting and storing rainwater and/or runoff for domestic or agricultural use. The stored rainwater and/or runoff should be protected against pollution.

**Water user association (WUA):** Growers are members of this association and pay this association a price for the use of water in the irrigation systems. The WUA manages the maintenance of the irrigation system and, in the case of supply-based systems, also the distribution of water to its members.

**Water use efficiency (WUE):** The ratio between crop yield and the total amount of water applied.

#### 4. EXAMPLE – RISKS SUMMARY

Risk	Issue		Status	Action
Physical	<b>Water scarcity</b>	Does the river basin or area face water scarcity due to the overexploitation of water resources? Can water scarcity affect the current or planned water usage by the producer? Does the producer contribute significantly to water scarcity in the river basin or area or might the producer do so in future?		
	<b>Drought events</b>	Does the river basin or area face droughts due to irregular rainfall? Can this phenomenon affect the producer's water usage ? How flexible is the farm's water usage? Can this phenomenon affect the environmental, social and/or cultural issues?		
	<b>Flood events</b>	Does the river basin or area face floods due to irregular rainfall or water management? Can this phenomenon affect the producer? Can this phenomenon affect the environmental, social and/or cultural issues?		
	<b>Water pollution</b>	Does the river basin or area face water pollution? Are current or potential pollution sources upstream or located in the same groundwater area as the producer? Can the pollution affect the producer? Can this pollution affect the environmental, social and/or cultural issues?		
	<b>Alternative water sources</b>	Do alternative non-overexploited and/or non-polluted water sources exist? Can this water be allocated to the producer on a regular basis? Can this water be allocated to the producer under extreme situations (drought, pollution, etc.)? Are there (new) storage mechanisms in order to address temporary extreme situations? What are the environmental effects of the alternative sources or water storage systems?		
Regulatory	<b>Water allocation and management scheme</b>	Is the river basin or area managed according to a plan or scheme? Has this plan or scheme been consulted to the public and interested parties and approved by the corresponding water authority? Is the plan being implemented and updated on a regular basis? Is the producer's water usage included in the plan or scheme? If not, is the producer's water usage coherent with the plan's allocation and management scheme? Does this plan consider adequately the environmental, social and/or cultural issues?		
	<b>Water usage permit</b>	Does a procedure exist to hold a water usage permit? Does the producer hold a water usage permit adequate to its water usage? Does this permit interact with other (water usage) permits?		

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Risk	Issue		Status	Action
	<b>Non-authorized water usage</b>	Does the producer use water (partially) without the correspondent permit? Do other users use water without the corresponding permit? Can this non-authorized water usage affect the producer's water usage permit or the water usage itself? Can this non-authorized water usage affect the environmental, social and/or cultural issues?		
	<b>Priority usage</b>	Is the usage of water prioritized in the river basin or area? What is the ranking of the producer in relation to other water users? Are specific regulations foreseen for extreme situations (drought, pollution, etc.)? Is there a risk for the producer's water usage taking into account the trend scenarios of priority water users and extreme situations? Can the permit be derogated in order to supply water to priority water users?		
<b>Reputational</b>	<b>Water conflict</b>	Does the river basin or groundwater area cross national, regional, local or cultural/ethnic borders? Are there conflicts about water in the river basin or area? What are their reasons? Are these conflicts addressed by conflict-resolution dialogue-processes? Is the producer involved in water conflicts in this particular area or in any other geographical area the producer operates? Are similar water users involved in water conflicts in the river basin or area or adjacent areas?		
	<b>Environmental issues</b>	What is the current situation of the freshwater environment in the river basin or area? What are the environmental and biodiversity trends for the river basin or area? Can these environmental trends affect negatively the farm's operations? Does the farm's water usage impact significantly, in direct or indirect form, the key environmental or biodiversity features? Has the producer developed a (public) environmental statement and/or plan? Does this plan respond to any water-related environmental conflicts or concerns that have arisen? Is this plan implemented, audited and updated on a regular basis? Is this plan publicly accessible?		



Risk	Issue		Status	Action
	<b>Social issues</b>	What is the current social situation regarding water issues (access to drinking water and adequate sanitation, etc.) in the river basin or area? What are the social trends for those aspects? Can social requirements or claims affect negatively the farm's operations? Does the farm's water usage impact significantly, in direct or indirect form, the access to drinking water and sanitation for the inhabitants of the river basin or area? Has the producer developed a (public) statement and/or plan in this regard? Does this plan respond to any conflicts or concerns that have arisen on the water usage? Is this plan implemented, audited and updated on a regular basis? Is this plan publicly accessible?		
	<b>Cultural issues</b>	What are the key cultural issues related to water in the river basin or area? What has been their evolution? Can cultural trends, requirements or claims affect negatively the farm's operations? Does the farm's water usage impact significantly, in direct or indirect form, the cultural heritage of the river basin or area? Has the producer developed a (public) statement and/or plan in this regard? Does this plan respond to any conflicts or concerns that have arisen on the water usage? Is this plan implemented, audited and updated on a regular basis? Is this plan publicly accessible?		
	<b>Farm's water management</b>	Is the water in the farm managed according to a plan? Does this plan include registers for historical, current and future water usage? Does this plan include provisions for the sustainable and efficient water usage? Does this plan respond to any conflicts or concerns that have arisen regarding the farm's water management? Is this plan implemented, audited and updated on a regular basis? Is this plan publicly accessible?		
<b>Financial</b>	<b>Financing</b>	Does the producer require regular or irregular external financing? Do the (current and potential) investors consider water-related criteria in their funding evaluation? Are there any specific aspects (e.g., water management plan, water usage permits) required by the investors? Do the investors establish thresholds for compliance with its water-related criteria?		

Risk	Issue		Status	Action
	<b>Insurance</b>	Does the producer subscribe insurances for its operations? Do the (current and potential) insurance operators consider water-related criteria in their evaluation? Are there any specific aspects (e.g., water management plan, water usage permits) required by the insurance operators? Do they establish risk thresholds for compliance with its water-related criteria?		
	<b>Water pricing</b>	Does the producer pay for the water usage? How is this price/tax/tariff fixed? Does it include operational costs and (environmental) externalities? Is the pricing system stable, foreseeable and transparent? How likely is it that water prices will be increased on a regular or irregular basis?		

## ANNEX CB 2 GUIDELINE: PLANT PROTECTION PRODUCT USE IN COUNTRIES THAT ALLOW EXTRAPOLATION

Registration Scheme in Country of Use	Safe Use Criteria (Operator and Environment)	Authorization of PPP for Use on Individual Crops
<b>No registration scheme exists:</b> Some control over PPP imports may be in place.	PPPs that are used shall have clear guidance for the user to allow for the safe use of the product in line with the 'International Code of Conduct on the Distribution and Use of Pesticides' (FAO Rome 2002).	Extrapolated uses are permitted.
<b>A registration scheme exists:</b> Imported PPPs are permitted for sale with the label of the country of origin. This may be in addition to the national labels for the PPPs.	The user of the PPP, which is a direct import, shall be provided with clear guidance to allow for the safe use of the product. This guidance could be in the form of label translations or notes provided by the distributor.	1. The imported PPP carries a label that matches the national approval.
		2. The imported PPP carries a label that is different to the current national approval. In this case this PPP can be used on the crop where the national approval is valid.
		3. The crop is not covered on the national label. Extrapolated uses are permitted, if the national scheme explicitly allows this practice.

### EXCEPTION:

Where field trials are performed by producers in cooperation with the government as the final trials before approval of PPPs, the producer can still comply with PFA requirements, even though part of the product will be destroyed or used for further analyses. There shall be clear traceability and information on the area (size) used for the trials. The producer shall also have available meaningful documents indicating that the producer is taking part in a legal field trial in full conformity with the legislation of the country of production. Furthermore, clear procedures shall exist on the management of these trials. The PPPs that are being trialed are not allowed for use on the product to be assessed and the residue testing shall not show residues of this product.

### ANNEX CB 3 GUIDELINE: CB 4.5 – RESIDUE ANALYSIS

Control Point	Interpretation
CB 4.5.1	<p>1. In all cases, evidence of the list of the current applicable MRLs for the country(ies)/region (even if it is the country of production itself) where the produce is intended to be traded in shall be available, or any other documentation that shows that the producer (or his direct customer) has incorporated this information.</p> <p>2. Communication with clients presented by the producer can be in the form of letters or other verifiable evidence. These can be present or future clients.</p> <p>3. As an alternative to 2., where for example the producer does not yet know with whom trading will take place, the producer can participate in a residue screening system that meets the strictest MRLs (or import tolerances if they exist and are different) in the country or region where produce is intended to be traded in. Where there is a harmonized MRL for that region, it must be conformed to. If the producer sells the product on the market of the country of production, the current applicable (national) MRL list shall still be available as in 1. above.</p> <p>4. Internal segregation and traceability of PFA compliant produce is needed if trying to meet MRLs of different markets for different batches of produce (i.e., simultaneous production for US, EU, country of production).</p> <p>5. This control point must be cross-referenced with the information given at the registration of the producer and any updates sent to the CB/VB since registration, i.e., to verify if the producer sells his/her product exclusively on the market of the country of production and declares this at registration.</p>

## ANNEX CB 4 GUIDELINE: VISUAL INSPECTION AND FUNCTIONAL TESTS OF APPLICATION EQUIPMENT

1. There shall be no leakages from the pump, spray liquid tank (when the cover is closed), pipes, hoses, and filters.
2. All devices for measuring, switching on and off, adjusting pressure, and/or flow rate shall work reliably and there shall be no leakages.
3. The nozzle equipment shall be suitable for appropriate application of the plant protection products (PPPs). All nozzles shall be identical (type, size, material, and origin), form a uniform spray jet (e.g., uniform shape, homogeneous spray), and there shall be no dripping after switching off the nozzles.
4. All the different parts of the equipment (sprayer), e.g., nozzle holder/carrier, filters, blower, etc. shall be in good condition and work reliably.

Source: Base document: DIN EN 13790-1:2004. 'Agricultural machinery - Sprayers; Inspection of Sprayers in Use - Part 1: Field Crop Sprayers'

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**Control Points and Compliance Criteria**  
**PRIMARY FARM ASSURANCE – Foundation Level**  
**COMBINABLE CROPS**

**Based on IFA CPCC V5.2**

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<b>CC</b>	<b>COMBINABLE CROPS</b>
CC 1	PROPAGATION MATERIAL
CC 2	MACHINERY AND EQUIPMENT
CC 3	CROP PROTECTION
CC 4	HARVESTED CROP HANDLING

**Note:**

Implementation for Combinable Crops for Primary Farm Assurance (PFA) compliance in version 5 will include compliance with modules AF, CB, and CC.

N°	Control Points	Compliance Criteria	Level
<b>CC</b>	<b>COMBINABLE CROPS</b>		
<b>CC 1</b>	<b>PROPAGATION MATERIAL</b>		
<b>CC 1.1</b>	<b>Seed/Rootstock Quality and Origin</b>		
CC 1.1.1	Are purchased seeds accompanied by records of variety name, batch number, supplier, and seed certification details, and are seed treatment records kept?	The producer shall provide records of variety name, batch number, supplier, seed certification details, and seed treatments applied.	Minor Must
CC 1.1.2	Do home-saved seeds have records available of the identity, source, and treatments applied (e.g., cleaning and seed treatments)?	The producer shall keep records on home-saved seeds and have them available on the farm.	Minor Must
<b>CC 2</b>	<b>MACHINERY AND EQUIPMENT</b>		
<b>CC 2.1</b>	<b>Hygiene</b>		
CC 2.1.1	Are lorries/trucks and trailers carrying crops for food or stock feed clean and fit for the purpose, with particular care given to the cleanliness of dual-purpose trailers, to prevent contamination?	Compliance shall be demonstrated through worker awareness in the interview as well as a visual assessment of transport vehicles that shows that they are kept clean and fit for the purpose. The type of cleaning shall be appropriate to clean what had previously been transported. No N/A, unless no supplement feeding of livestock on farm.	Major Must
<b>CC 3</b>	<b>CROP PROTECTION</b>		
<b>CC 3.1</b>	<b>Choice of Chemicals</b>		
CC 3.1.1	Does the producer comply with restrictions imposed by national or local legislation on plant protection product (PPP) application methodology?	Where national or local legislation imposes restrictions on methods of PPP application (for example, distance to water ways while spraying, etc.), the producer shall show knowledge in the interview and demonstrate compliance.	Minor Must



N°	Control Points	Compliance Criteria	Level
<b>CC 4</b>	<b>HARVESTED CROP HANDLING</b>		
<b>CC 4.1</b>	<b>Hygiene</b>		
CC 4.1.1	Are all product store walls, floors and horizontal surfaces of any storage, holding or reception facilities cleaned and, where appropriate, washed and insecticide treated prior to use? Are residues of previous crops cleaned from all areas including ventilated floors and beneath conveyors?	The producer shall demonstrate compliance in the interview and through visual inspection. Applicable to all farms that store harvested crop. Insecticides used shall comply with all label instructions (registrations, consumer intervals, etc.) as in CB 4.1 and treatments shall be recorded according to CB 4.2.	Major Must
CC 4.1.2	Where livestock buildings are intended for use as product storage or temporary holding facilities, are they thoroughly cleaned and power washed at least 5 weeks prior to storage?	The producer shall demonstrate compliance in the interview and through visual inspection. Applicable to all farms that store harvested crop.	Major Must
CC 4.1.3	Is pre-harvest insect trapping in product storage areas carried out to demonstrate that cleaning operations have been successful?	Compliance is demonstrated through receipts for traps and records detailing monitoring. Baits containing nuts should not be used.	Recom.
CC 4.1.4	Are signs showing the main hygiene instructions for workers and visitors clearly displayed in the handling area?	Signs showing the main hygiene instructions shall be visibly displayed in the handling area.	Minor Must
CC 4.1.5	Is stock rotation being managed?	Stock rotation shall be managed to ensure maximum product quality and safety.	Recom.
<b>CC 4.2</b>	<b>Pest Control</b>		
CC 4.2.1	Are there procedures for monitoring and correcting pest populations in the packing and storing areas?	The producer shall demonstrate compliance in the interview and through a visual assessment. No N/A	Minor Must
CC 4.2.2	Is there visual evidence that the pest monitoring and correcting process are effective?	Compliance is demonstrated through a visual assessment. No N/A.	Major Must
<b>CC 4.3</b>	<b>Post-Harvest Treatments (N/A if no post-harvest treatment)</b>		
CC 4.3.1	Are all label instructions observed?	Clear procedures are in place and documentation is available, i.e., post-harvest biocides and PPP application records and packaging/delivery dates of treated products, which demonstrate that the label instructions for chemicals applied to the harvested crop have been observed.	Major Must

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N°	Control Points	Compliance Criteria	Level
CC 4.3.2	Does the producer only use biocides and PPPs that are officially registered in the country of use and approved for post-harvest use on the harvested crop being protected?	All the post-harvest biocides and PPPs used on the harvested crop are officially registered or permitted by the appropriate governmental organization in the country of application, approved for use in the country of application, and approved for use on the harvested crop to which it is applied as indicated on the labels of the biocides and PPPs. Where no official registration scheme exists, refer to the guideline (Annex CB 2) on this subject and the 'FAO International Code of Conduct on the Distribution and Use of Pesticides'.	Major Must
CC 4.3.3	Are all of the post-harvest PPP applications also considered under points CB 4.5 ('Plant Protection Product Residue Analysis') of this document?	There is documented evidence that demonstrates that the producer considers all post-harvest fungicide or insecticide applications under control point CB 4.5 ('Plant Protection Product Residue Analysis') and acts accordingly.	Major Must
CC 5.3.4	Is the source of water used for post-harvest treatment potable or declared suitable by the competent authorities?	The water has been declared suitable by the competent authorities and/or a water analysis has been carried out at the point of entry into the washing machinery within the last 12 months. The levels of the parameters analyzed are within accepted WHO thresholds or are accepted as safe for the food industry by the competent authorities.	Minor Must
CC 4.3.5	Are the biocides and PPPs used for post-harvest protection stored away from produce and other materials?	Biocides and PPPs etc. are kept in a designated area away from produce to avoid chemical contamination of produce.	Major Must
<b>CC 4.4</b>	<b>Records of Post-Harvest Treatments</b>		
	Records of post-harvest applications shall be kept and shall include the following criteria:		
CC 4.4.1	The identity of the harvested crops (i.e., lot or batch of produce)?	The lot or batch of harvested crop treated is documented in all records of post-harvest biocide and PPP applications.	Major Must
CC 4.4.2	Location	The geographical area, the name, or reference of the farm or harvested crop-handling site where the treatment was undertaken is documented in all records of post-harvest biocide and PPP applications.	Major Must
CC 4.4.3	Application dates	The exact dates (day/month/year) of the applications are documented in all records of post-harvest biocide and PPP applications.	Major Must

N°	Control Points	Compliance Criteria	Level
CC 4.4.4	Type of treatment	The type of treatment used for product application (i.e., spraying, drenching, gassing, etc.) is documented in all records of post-harvest biocide and PPP applications.	Major Must
CC 4.4.5	Product trade name	The trade name and active ingredient of the products applied are documented in all records of post-harvest biocide and PPP applications.	Major Must
CC 4.4.6	Product quantity	The amount of product applied in weight or volume per liter of water or other carrier medium is recorded in all records of post-harvest biocide and PPP applications.	Major Must
CC 4.4.7	Name of the operator	The name of the operator who has applied the PPP to the harvested crop is documented in all records of post-harvest biocide and PPP applications.	Minor Must
CC 4.4.8	Justification	The common name of the pest and/or disease to be treated is documented in all records of post-harvest biocide and PPP applications.	Minor Must
<b>CC 4.5</b>	<b>Storage of Harvested Crop</b>		
CC 4.5.1	Is the risk of contamination by glass or any other physical contaminants prevented?	Light bulbs and fixtures suspended above harvested crop or material used for harvested crop handling are of a safety type or are protected/shielded so as to prevent contamination of food in case of breakage. The risk for contamination with any other physical contaminants shall also be prevented. This applies to temporary holdings, long-term stores, and all product movement areas.	Major Must
CC 4.5.2	Is access of domestic animals and birds to the facilities restricted?	Domestic animal and bird access to the facilities is managed to prevent harvested crop contamination.	Major Must

N°	Control Points	Compliance Criteria	Level
CC 4.5.3	Is a specific storage strategy required for longer-term product storage?	Where longer-term storage takes place, producers shall demonstrate compliance by means of records detailing the regular checking and follow-up actions, such as regular monitoring of the temperature and condition of the product, including investigation of any changes. Bird and rodent activity, water ingress, and hot spots within the heap shall have been acted upon and remedied. The frequency of inspection may be reduced once the condition of the crop has stabilized. No N/A.	Recom.
CC 4.5.4	Is the storage adapted to the type of product and conditions, and is implementation of best practice encouraged to minimize the risk of contamination?	Storage may be inside or outside. The storage conditions are adapted to the type of product and conditions (weatherproof, solid floors, suitable walls and doors, etc.).	Major Must
CC 4.5.5	Do harvested crops that are susceptible to deterioration and that are stored for more than a few days in conditions that may lead to their deterioration have conditioning? Does the long-term stored product have a moisture content and temperature suitable for storage?	Damage caused by heating shall be avoided. Product conditioning equipment shall be available, where applicable, and the producer shall demonstrate compliance in the interview. No N/A.	Minor Must
CC 4.5.6	Does the responsible person have easy access to product storage monitoring devices if harvested crops are stored?	The responsible person shall demonstrate compliance by showing evidence of the monitoring devices or policy.	Major Must
CC 4.5.7	In the case of flat product stores, are hard outside loading areas maintained in a clean and well-drained condition?	Loading areas should be clean with no dips and areas where standing water can gather.	Recom.
<b>CC 4.6</b>	<b>Haulage</b>		
	<i>Cross-contamination is the major risk when transporting combinable crops for food and feed. The loading sequence, cleaning and disinfection are crucial control measures in order to prevent cross-contamination.</i>		
CC 4.6.1	Is there a visual check based on a written procedure before every transport?	There is a visual check before every transport that the loading compartment is clean. This means that it is dry and is completely empty and free of remains and odors from the previous load. There is a written procedure outlining the criteria for visual inspection. The producer shall demonstrate compliance in the interview and through a visual assessment.	Major Must