NESTLÉ AGRICULTURAL GUIDELINES

Nestlé

FUNDACIÓN GLOBAL NATURE

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1. NUTRIENT MANAGEMENT

A series of practices that aim to use crop nutrients as efficiently as possible with the objective of improving soil health, meeting the nutrient requirements of crops for an increased productivity while reducing any potential impact on the environment.

AGRONOMIC IMPORTANCE

Proper nutrition is essential for satisfactory crop growth and production and for avoiding problems related to excess of nutrients, such as presence of weeds, soil toxicity or vulnerability to pests.

ENVIRONMENTAL IMPORTANCE

Nutrient losses due to poor nutrient management, especially nitrogen and phosphorus, are closely related to water pollution, habitats degradation and biodiversity loss.

RECOMMENDED MEASURES

Nutrient Management measures
Soil analysis
Nitrogen fractionation in early applications
Optimization of nitrogen used
Plant health analysis
Post-harvest nitrogen balance

1.1 SOIL ANALYSIS

Description

Soil analysis helps to determine soil's physical and chemical properties, including macro and micronutrient content. The information retrieved through soil analysis and its interpretation is critical for designing and periodically updating fertilization plans, and also for assessing the success of farm management practices in the long term.

Although soil analysis includes useful information that may guide the farmer in other decisions, in this case it is directly linked to more efficient use of crop nutrients and to nitrogen management, nitrogen being the most important source of pollution in agriculture.

For more details on sampling, minimum contents of soil analysis and its interpretation, please refer to this supporting document.

Objective

Farmers have a good understanding of the characteristics of their fields' soils and base their agronomic decisions, especially fertilization plans, on this information.

Specific indicator

A soil analysis is carried out at least every three years in the assessed field or at least in a homogeneous area. A homogeneous area is defined as piece of land with similar edaphic characteristics, managed by the same farmer and within a radius of 2 km around the target field.

Implementation level

Basic

Required evidence

Soil analysis annexed to Farm Register Book

Potential constraints and benefits

Soil analysis is becoming a common practice for agronomic decision making. Most farmers have access to such services, in some cases it can be granted by public administrations. Although supposing an extra cost for the farmer, it is considered a basic information for designing nutrient management plans and a cost-effective practice.

1.2 NITROGEN SPLIT IN EARLY APPLICATIONS

Description

Nitrogen applications are critical during early stages of crop growth, but excess nitrogen during this period increases the risk of nutrient loss as the plant systems are not yet developed and plants cannot uptake nutrients.

Split nitrogen applications consist of calculating the total nitrogen that is to be applied to a crop during the whole season and splitting it into several applications, meeting the crop stage needs and minimizing the risk of negative environmental impacts.

Research and regional agricultural programs to avoid nitrate pollution in Europe have shown than applying no more than one third of total nitrogen needed at planting or just after sowing, not only diminishes nutrient lost but also contributes to better crop nutrition.

For general guidance on nutrient management, please refer to these supporting documents.

Objective

Farmers reduce the risk of nitrogen leaching by reducing the amount of nitrogen applied during crop growth early stages.

Specific indicator

Early nitrogen applications (prior to planting or sowing, or when plants are in early growth stages) do not exceed one third of the nitrogen needs for the entire growing season. Please note that organic matter applications (one month after and before planting) will also be considered in the calculations.

Implementation level

Basic

Required evidence

Nitrogen applications are registered in the Farm Register Book for the last agronomic campaign. Records include dates and total amount of nitrogen used in each application.

Potential constraints and benefits

Nitrogen splitting has no technological limitations and contributes to better plant nutrition and to avoid overfertilization-related problems in the field (more vulnerable crops to pests, more weeds, etc.).

1.3 OPTIMIZATION OF NITROGEN USE

Description

Nitrogen is one of the most critical elements of nutrient management plans as it is directly related to crop yields; however, high amounts of applied nitrogen do not necessarily entail better yields. When applied in excess, nitrogen can have a significant and negative impact on the environment and on crop health.

Nitrogen needs can be calculated in different ways, but this measure proposes a simple calculation for a more practical approach. It is important to highlight that the objective of this measure is to avoid an excess of nitrogen, meaning amounts that are clearly out of scope according to agronomists and that have negative effects on the environment.

For general guidance on nutrient management, please refer to these supporting documents.

Objective

Farmers reduce nitrogen surplus and the risk of it potentially leaching to the environment.

Specific indicator

Farmers calculate the nitrogen inputs and outputs, and the calculation of total kg of nitrogen applied per ton of raw material harvested do not exceed the reference value given for each specific crop system. Please refer to the following values for each crop:

Processing tomatoes: 2,1 kg. N/ton
Bell peppers: to be updated
Onions: to be updated

Implementation level

Basic

Required evidence

Nitrogen applications registered in the Farm Register Book for the last agronomic campaign

Potential constraints and benefits

The reference values given for each crop exceed fertilization needs according to agronomic specialists. Reaching these values entails an overfertilization, which has negative effects on plant's health and on the farm competitiveness, as well as on the environment. There are no identified technological or economic limitations for implementing this measure.

1.4 PLANT TISSUE ANALYSIS

Description

Plant tissue analysis is a common practice that uses multiple methodologies to monitor plant health in general. Analyzing plant tissue (generally leaves) is useful to monitor nutrient levels, detect deficiencies and toxicities, and even phytosanitary problems, such as viral pests. Tissue analysis can also be used to determine whether supplemental micronutrients are needed, or even to monitor an excess of nitrates (e.g. in leaf and baby-leaf vegetables) that reduce the shelf life of products. This measure addresses plant health problems avoiding non-effective practices that may have a negative impact on the environment.

For more details on plant tissue analysis technology and interpretation of results, please refer to the following supporting document.

Objective

Farmers have a better knowledge of crop health for adapting fertilization plans and solving other crop health issues.

Specific indicator

Farmers implement tissue analysis as a common practice to address potential issues with pest infestations, nutrient deficiencies or nitrate excess.

Implementation level

Advanced

Required evidence

Tissue analysis report.

Potential constraints and benefits

Tissue analysis is becoming more common due to cost reduction and to new technologies (e.g. multispectral analyses performed by drones). Despite being an extra expenditure, farmers supported by technical advice on the interpretation of results, can make decisions that will make this practice cost-effective.

1.5 POST-HARVEST NITROGEN BALANCE

Description

A nitrogen balance is an agronomic calculation that considers all the nitrogen inputs and outputs in the crop management, accuracy is better guaranteed when the balance is done annually, specifically after harvesting.

Calculations requires specific annual data at the farm level for all the nitrogen inputs (mineral fertilizers, manure, organic fertilizers, nitrogen fixed by leguminous, remaining N on soils, atmospheric deposition, etc.) and outputs (nitrogen exportation in fruits and other tissues, volatilization).

A post-harvest nitrogen balance is considered a long-term practice that allows farmers to better understand and optimize nutrient management plans and applications.

Guidance on post-harvest nitrogen balance interpretation, calculation method and reference values are given here.

Objective

Famers reduce the nitrogen surplus associated with their production systems management and evaluate in the long term the effectiveness of nutrient management measures to avoid environmental pollution by nitrates.

Specific indicator

The annual post-harvest nitrogen balance calculated for the target field results in no more than 50 kg. N/ha surplus. This reference value is the average amount of nitrogen leached in the EU27 according to Eurostat.

Implementation level

Advanced

Required evidence

Post-harvest nitrogen balance calculation.

Potential constraints and benefits

Although being one of the most reliable agronomic calculations for nitrogen adjustment, post-harvest nitrogen balances are not commonly calculated sometimes due to the lack of data, calculation complexity and for giving information once the season is over. This practice is considered as having a high learning curve for farmers.

2. SOIL RESOURCES MANAGEMENT

Soil management refers to a series of practices that aim to improve the soil quality: increasing crop productivity and conserving soil resources.

AGRONOMIC IMPORTANCE

Soil is the fundamental pillar for almost all agricultural activities and its conservation a keystone for the farm competitiveness. Healthy soils hold a rich and complex biological community that can modify its physical and chemical properties resulting in a better capacity for storing nutrients and water and being more resilient to changes. All this result in healthier crops and better yields.

ENVIRONMENTAL IMPORTANCE

Poor soil management practices can entail significant environmental problems, such as erosion, reduced fertility, acidification, loss of carbon content, salinization, and contamination. Addressing these problems without understanding soils as a living organism can lead to additional problems, such as overfertilization or soil chemical disinfection.

RECOMMENDED MEASURES

Soil Management measures
Crop rotation
Winter soil coverage and related practices
Regular organic fertilizer applications

2.1 CROP ROTATION

Description

Crop rotation is the agricultural technique of growing different crops in same field in sequential seasons. Its main objective is to alternate crops with different requirements and vulnerabilities to pests and diseases. As a result, soil quality is improved, and agronomic problems that occur in monocultures are reduced by breaking pest cycles, reducing the need for weed control, and minimizing the depletion of soil nutrients.

For more information on crop rotation and crop diversification, please refer to the following supporting document.

Objective

Farmers rotate crops to conserve the health and productivity of agricultural soils and avoid their degradation.

Specific indicator

Annual rotation is performed such that a crop is never repeated in the same field in subsequent years. Winter soil covers (*see next practice*) are not considered a different crop, and thus a different crop is needed in the next campaign for complying with this measure. Nestlé recommends not rotating with plants from the same family.

Implementation level

Basic

Required evidence

Information in Farm Register Books, contracts or any other reliable document.

Potential constraints and benefits

Under certain climates, the recommended long and diverse crop rotation may be limited to only two or three crops. Even in these cases, crop rotation delivers agronomic and environmental benefits that shall be considered.

2.2 WINTER SOIL COVERAGE (AND RELATED PRACTICES)

Description

Soil covers are used to protect soil from erosion and degradation, especially during critical periods (e.g. rainy periods and winter season). This can be done by using intermediate crops (a sown crop that is compatible with the crop calendar), green manures (sown plants for improving nutrient content on the soil), catch crops (sown plants that retain nutrients for the next crop), cover crops (wild or sown crops that do not have necessarily a commercial interest), and inert natural covers (such as mulching, stubbles, etc.). Living covers are preferred over inert natural covers for having added benefits apart from avoiding soil erosion. Inert plastic mulch or covering is not considered in this measure.

For more information on soil protection, please refer to the following supporting document.

Objective

Soil exposure is minimized to avoid negative environmental impacts and ensure good soil conditions.

Specific indicator

The soil cover is in place just before planting or after harvesting the assessed crop.

Implementation level

Basic

Required evidence

Information in Farm Register Books or pictures that can demonstrate the implementation of the practice.

Potential constraints and benefits

Water availability can be a major constraint for implementing successfully soil covers and winter covers may be the only option. Sown soil covers represent an additional cost for farmers, but in this case the benefits obtained in terms of soil quality improvement or nutrient restitution offsets the investment.

2.3 SUPPLEMENTARY ORGANIC MATTER APPLICATIONS

Description

Organic matter applications refer to the incorporation of any kind of organic substances to the soil, including manure, compost and organic wastes (usually residues from other farm or processing activities. Please note that untreated human waste and sewage applications are forbidden. If liquid manure is used, it will only be validated as a good practice if it has been applied locally on the soil or injected into the soil, so counteractive effects (such as greenhouse gas emissions) are reduced to the maximum.

Organic substances are commonly more stable due to their chemical and structural complexity, thus they tend to release nutrients slowly, which reduces the risks of nutrient (specifically nitrogen) leaching, while contributing to improve soil structure and biological activity.

For general guidance on soil protection, please refer to this supporting document.

Objective

Farmers regularly apply organic substances to agricultural soils to increase (or maintain) the soil's organic matter content and enhance its biodiversity.

Specific indicator

Organic substances are applied at least every four years to restore, maintain or enhance soils' organic matter content and biological activity.

Implementation level

Basic

Required evidence

Information on organic substances applications reflected in the Farm Register Books of the last four campaigns.

Potential constraints and benefits

The volume of organic substances needed to cover farmer's needs may have a limited availability. In some crops, application of manures during growing season is avoided to minimize the risk of bacteriological contamination, but it is acceptable during any of the previous four years when other crops are produced. Cost of transportation and application may be a constraint, however, the agronomic benefits (better water infiltration, better water retention, enhanced fertility, healthier crops, etc.) should encourage farmers to overcome the problems encountered.

3. CROP PROTECTION

Crop protection refers to a series of practices aligned with the Integrated Pest Management approach, that aim to ensure crop-plant protection while efficiently using the minimum amount of agrochemicals to reduce possible negative impacts on the environment.

AGRONOMIC IMPORTANCE

Crop protection management is one of the most important aspects to progress towards agricultural sustainability. The Directive 2009/128/EC of the European Parliament and of the Council of 21 October 2009 establishes a common framework to achieve the sustainable use of pesticides across the EU. This Directive is now the baseline for the EU countries with new and significant advances regarding pesticides use, management, storage and other Crop Protection Products (CPPs) operations. Additionally, there is a growing pressure about pesticide use and to adopt the Integrated Pest Management approach that is the basis for the practices included in this section.

ENVIRONMENTAL IMPORTANCE

CPPs include all the pesticides used during the crop cycle, such as herbicides, fungicides, and insecticides. They are specifically designed for combating pests and diseases, and consequently all of them have significant effects on biodiversity; therefore, all the operations with CPPs (spraying, cleaning, transport, storage, etc.) can entail risks to the environment.

RECOMMENDED MEASURES

Crop protection measures
Register of crop protection operations, products and users
Phytosanitary passport
Best practices for CPP equipment cleaning
Monitoring mechanisms for decision-based pest management
Alternative options to agrochemicals
Use of agrochemicals accepted in organic farming

3.1 REGISTER OF CROP PROTECTION OPERATIONS, PRODUCTS AND USERS

Description

Crop Protection Register Sheet is now mandatory for all the farmers in the European Union that benefit from Common Agriculture Policy grants. Within the Sustainable Sourcing program, this measure goes beyond legal compliance: it is applicable for all farmers suppling to Nestlé and requires further information about crop protection activities

Objective

Farmers document all on-farm crop protection activities up to factory gate.

Specific indicator

Farmers include in their Farm Register Books a completed Crop Register Sheet, that also includes:

- Data of trained technician responsible for each crop protection activity (training certificates may be requested).

- Data of trained technician in charge of all crop protection system (training certificates may be requested).

- Product type, commercial name, active ingredient and reason for application. Products that do not have an active matter (and could be considered not pesticides) shall also be registered, in the same sheet where the pesticides are included or in a complementary one.

Implementation level

Basic

Required evidence

Farm Register Books.

Potential constraints and benefits

No technological or economic constraints are foreseen. This practice improves traceability and control on farm operations which adds transparency to farm management.

3.2 PHYTOSANITARY PASSPORT

Description

A phytosanitary passport is a complete record of the plant protection products and fertilizers used as well as any other activity that happens before the crop is established in the field. It enables a complete traceability and applies both to seeds and plantlets.

Objective

Farmers ensure that crop protection information is available for all plant materials prior to planting or sowing.

Specific indicator

Farmers have a phytosanitary passport that includes a complete record of the plant protection products and fertilizers used as well as any other activity that happens before the crop is established in the field.

Implementation level

Basic

Required evidence

Phytosanitary passport is included in Farm Register Books or as an annexed document.

Potential constraints and benefits

No technological or economic constraints are foreseen, as most seed and plantlets producers deliver this information to customers.

3.3 CPP EQUIPMENT CLEANING

Description

The dilution of agrochemical residues (e.g. triple rinsing) and their subsequent release into the environment or crop fields is a common and accepted practice; however, better practices are being developed and implemented to improve the responsible management of hazardous substances. This measure encourages producers to implement better systems and procedures for CPP equipment cleaning, and to invest in controlled environments and facilities for such purposes.

Objective

Farmers implement mechanisms for the responsible handling of crop protection product residues from cleaning application equipment or pesticide containers with the objective of mitigating and eliminating contamination risks.

Specific indicator

The farmer uses dedicated facilities or equipment that ensures a responsible management of CPP residues from application equipment.

Implementation level

Advanced

Required evidence

Annexed document to the Farm Register Book from the CPP equipment cleaning service provider that proves that the farmer has used these services or facilities.

Potential constraints and benefits

Dedicated facilities for cleaning CPP equipment are expensive and usually implemented collectively.

3.4 MONITORING MECHANISMS FOR DECISION-BASED PEST MANAGEMENT

Description

Pest monitoring consists of a combination of mechanisms implemented to locate, identify and quantify the presence and severity of pest infestations within production plots. These mechanisms are an essential part of the Integrated Pest Management approach. Pest monitoring is carried out under the supervision of an expert that performs regular field visits to identify potential pests, determine pest population levels, identify potential natural enemies' populations and decide the optimum moment for the pest control, according to established action thresholds, thus maximizing its efficiency.

There are several monitoring techniques and mechanisms available, including sticky traps, pheromone traps, fungal spore monitoring, pest and disease counts on transects through fields, and even drone overflights. For further information about pest monitoring mechanisms, please refer to the document "XXX".

Objective

Farmers implement mechanisms to monitor pests to assist with the pest control decision making process.

Specific indicator

Farm documentation demonstrates the influence of monitoring results on pest and disease control decisions, including for pesticide applications. Simple advice on Integrated Pest Management, pest monitoring or pests' thresholds will not be considered.as full implementation of this measure.

Implementation level

Basic

Required evidence

Documented mechanism for pest monitoring annexed to the Farm Register Book. The consistency of this measure can be cross-checked with the list of CPP used.

Potential constraints and benefits

Despite becoming increasingly common, pest monitoring mechanisms are not widely used due to poor knowledge of Integrated Pest Management strategies and benefits. Expert advice may be a constraint, as monitoring mechanisms are only tools for making informed decisions. However, the adoption of such tools and informed decisions can suppose a reduction in the use of synthetic pesticides and an increased efficiency in agricultural inputs use, resulting in a smaller environmental footprint and more farm competitiveness.

3.5 ALTERNATIVES FOR NON-CHEMICAL PEST CONTROL

Description

Undesired plants and pests can be controlled in some situations without using synthetic pesticides, usually through mechanical controls (such as barriers, traps, tilling and manual weed control) and/or biological controls (such as allelopathy and the use of predators, parasitoids, nematodes, bacteria and other organisms' populations). Despite of not being technically considered biological control, the use of pheromones or pheromone traps are also considered part of this measure.

For detailed information on alternatives to the use of agrochemicals, please refer to the following document

Objective

Farmers use and implement non-chemical treatments for pest control whenever is feasible.

Specific indicator

Farmers implement non-chemical alternatives (mechanical control, biological control or sexual confusion with pheromones) for pest control and document their use.

Implementation level

Advanced

Required evidence

Information in Farm Register Books or annexed documents.

Potential constraints and benefits

The alternative methods to agrochemicals described in this practice still have an impact on the environment (e.g. energy use, GHG emissions, etc.) and in some cases are not feasible; however, they are an interesting alternative especially when agrochemical prices are continually increasing. In that sense, exploring alternatives for not using agrochemicals (probably supported by other practices, like improvement of ecological infrastructures), can lead to economic savings and to ensure very low residues on raw materials. Some pests are also known for having developed resistance against some chemical molecules, thus using non-chemical alternatives can be considered a chance to fight more efficiently against pests and diseases.

3.6 USE OF LOW TOXICITY SUBSTANCES FOR PEST CONTROL

Description

Under certain conditions, farmers can control pest infestations by using active ingredients and substances with low toxicity. This measure is directed towards encouraging farmers to use such substances. Considering that CPP's toxicity levels are constantly under revision, not easily available to farmers and in some cases are difficult to interpret, this measure takes a simpler approach by assuming that substances accepted in EU organic farming have lower risk categories. This way accepted products are easier for farmers to check, and the objective of the measure is met. Please note that for some of these substances, organic agriculture standards have defined maximum amounts to be used and this shall also be respected (e.g. a maximum of 6 kg of copper can be used per hectare). Bio-stimulant products are acceptable but will not be considered as plant protection products unless they contain copper or sulfur.

For more information on the products authorized, please refer to the following document.

Objective

Farmers are aware of and use low toxicity substances for pest control whenever feasible.

Specific indicator

Farmers use products authorized by EU organic agriculture for pest and disease control.

Implementation level

Advanced

Required evidence

Low toxicity substances, accepted by the EU organic agriculture framework, are included as part of the CPP products used by farmers and this information included in Farm Register Books.

Potential constraints and benefits

Organic agriculture is not only based on the use of low toxicity CPPs. The agroecosystem is built in order to be more resilient to pests (e.g. by developing ecological infrastructures that hold natural enemies and contribute to pest control). The use of low toxicity products authorized in organic agriculture may not be that effective when used in a conventional agriculture scenario, and in some cases, there may be no possible alternative to the use of certain active substances. However, the use of less toxic substances is an interesting approach for farmers, as in the last years some product specifications and companies are requiring very low maximum residue levels (MRLs) and additionally this trend can open new and interesting possibilities for farmers (e.g. baby food production, integrated production, etc.).

4. BIOSIVERSITY CONSERVATION AND MANAGEMENT

Biodiversity conservation and management refers to a series of practices that enhance biodiversity at the farm and field level, and that minimize the indirect negative impacts of agricultural activities on biodiversity.

AGRONOMIC IMPORTANCE

Although the main aim of agricultural landscapes is the production and harvesting of food, its management must be sensitive to biodiversity. While conserving and enhancing biodiversity may come at a cost to producers, there are immeasurable benefits to them, including soil formation and fertility, pollination, reduction of pest populations, increased resilience of the agroecosystem in the face of climate change and other pressures, among other benefits.

ENVIRONMENTAL IMPORTANCE

Approximately 50% of Europe's surface is used for agricultural production. The fast-growing world population has increased the need for food, and industrialized countries have changed their consumption patterns and globalized the food market. These trends have led to the expansion of agricultural land and more intensive production systems, with dramatic consequences for overall biodiversity as a direct result of changes in land-use, destruction of primary ecosystems, loss of crops' genetic diversity, over-exploitation and pollution of water and soils, high pesticide pressure and the introduction of non-native invasive species.

RECOMMENDED MEASURES

Biodiversity conservation measures
Responsible growing media
Crop diversification
Buffer strips in cultivated areas
Implementation of ecological infrastructures

4.1 RESPONSIBLE GROWING MEDIA

Description

Peat is a non-renewable material commonly used as a rooting medium. The exploitation of this resource has a significant impact on sensitive habitats and biodiversity. Although phasing out peat as growing media is the final goal of this measure, the current situation is far from this objective. Farms are requested, to use certified peat not sourced from high value conservation areas, while finding alternative materials for growing media.

Objective

Farmers phase out peat as growing media and ensure that peat is not sourced from high value nature areas.

Specific indicator

Peat is not used as rooting media or farmers use peat with a certification that demonstrate that it has not been sourced from high nature value areas. Until a list of accepted certifications is created, certifications will be assessed in a case-by-case basis.

Implementation level

Basic

Required evidence

Certification annexed to Farm Register Books.

Potential constraints and benefits

Phasing out peat in seedlings is still a challenge, as in most cases there are no equivalent solutions using other materials. Certified peat is not offered widely and may suppose an additional cost for farmers. However, farmers who decide exploring the phasing out of peat progressively or use certified peat not impacting high nature value areas, may be front-runners as future policies may limit peat use in the future.

4.2 CROP DIVERSIFICATION

Description

Crop diversification is important for enhancing in-farm biodiversity and support conservation efforts. Many studies show that the diversity of agricultural production and the complexity of farmland elements are strongly related to biodiversity because crop diversification entails different land uses, agricultural pressures, growing conditions, field operations, and different resources for wildlife. Agricultural production offers different ecological niches for holding habitats and species that provide ecological services such as pollination, pest control, etc. Almost all the measures in this code are implemented at field level, but this measure widens the scope of the Handbook to the farm, that is, this measure requires information beyond the field level and explore how the farmland is used (therefore needing data that is not related to the crop supplied to Nestlé).

Objective

Farmers reduce the impact of their activities on biodiversity by diversifying agricultural land uses.

Specific indicator

In order to keep it as simple as possible from the technical and verification point of view, this measure is inspired in the definition of crop diversification given by the European Union in the Common Agricultural Policy (only mandatory for Greening beneficiaries). Therefore, the following will be assessed:

- Farmers managing more than 10 hectares grow at least two different crops within the same growing season.
- Farmers managing more than 30 hectares grow at least three crops within the same growing season.

Implementation level

Basic

Required evidence

Common Agricultural Policy declaration annexed to Farm Register Books.

Potential constraints and benefits

No technological or economic constraints are foreseen. Diversifying crops does not entail necessarily an additional cost or managing complexity, while not diversifying crops in such large agricultural surfaces can suppose a risk to farmers for agronomic and economic reasons.

4.3 BUFFER STRIPS IN CULTIVATED AREAS

Description

For the purposes of this program and the present guidelines, a buffer strip is defined as a strip of natural or planted non-crop vegetation within cultivated area, that is wider than one meter, a minimum length of 100 meters, has a reasonably homogenous composition, and is free of agrochemical/ applications. Non-vegetated strips will not be considered as full implementation for this measure.

Field margins and vegetation strips are increasingly being considered as vital habitat for biodiversity in agricultural landscapes. These sites are beneficial for animals' feeding, shelter and breeding, and allow some space for the growth of wild plants. They work as buffers to prevent soil erosion and the transfer of agricultural pollutants from cropped areas to non-cropped areas, particularly aquatic habitats. Buffer strips have agricultural benefits too: they can reduce the presence of foreign bodies, act as pest control (as trap or repellent) and can provide habitat for crop pollinators. In some situations, the implementation of buffer strips is mandatory (i.e. along aquatic habitats and in some areas vulnerable to nitrate pollution) but this measure promotes the use of buffer strips in all situations.

Objective

Farmers implement buffer strips within their cultivated area.

Specific indicator

Buffer strips wider than one meter, a minimum length of 100 meters, a reasonably homogenous composition and agrochemical/free, are stablished within the cultivated area.

Implementation level

Basic

Required evidence

Pictures of the buffer strips and location of the buffer strip on a farm map, sketch or plan.

Potential constraints and benefits

Buffer strips may suppose a slight reduction of cultivated surface, especially in narrow fields. Some farmers prefer an active management of buffer strips, with sown plants, for avoiding the impact of weeds, and this entails a regular investment. Buffer strips, however, have multiple benefits, such as supporting pollinator habitats and natural enemies for controlling pests, impeding soil erosion in case of heavy rains, reducing the impact of pesticides drifts from neighbors and reducing the impact of foreign bodies in the fields beside roads.

4.4 IMPLEMENTATION OF ECOLOGICAL INFRASTRUCTURES

Description

Ecological infrastructures are the natural and seminatural habitats that occur in non-cultivated areas of the farm with a high potential for holding biodiversity and ecosystem services. For detailed information about ecological infrastructures characteristics, please refer to this supporting document.

Being a key issue for Responsible Sourcing Program, the implementation of an improvement plan for biodiversity conservation is mandatory for all the processors and associated farms joining the Creating Shared Value initiative, with three main options available:

1) Finding a reliable local partner for implementing ecological infrastructures within the farm and according to the guidelines provided in the document "Regional Biodiversity Analysis". Local partners must be experts on biodiversity and independent from the supplier. Nestle will review the proposed implementation approach with respect to the objective of this best practice.

2) Document the activities and efforts already in place towards the implementation of ecological infrastructures, including evidence of such structures and how are the aligned with the guidelines provided in the document "Regional Biodiversity Analysis". Nestle will review the proposed implementation approach with respect to the objective of this best practice.

3) Submit a request to Nestlé for technical support and co-funding for the implementation of this measure.

Objective

Farmers actively promote ecological infrastructures.

Specific indicator

Processors draft a Biodiversity Action Plan (BAP) according to the characteristics of the product and farmers they source from. The BAP:

- Includes short- and medium-term actions to foster biodiversity conservation.
- Is aligned with the actions compiled in the Regional Biodiversity Analysis, which contains biodiversity priorities and main challenges.
- Defines specific goals and timeframes.
- Includes a mechanism to ensure progressive engagement and improvement of supplier farms.

Implementation level

Basic

Required evidence

Visits to farms, Biodiversity Action Plan, monitoring system.

Potential constraints and benefits

The development of a Biodiversity Action Plan is new for most farmers and processors. Farmers and processors may have difficulties identifying ecological infrastructures at farm level. Also, they may sometimes perceive that increasing the area or enhancing the quality of ecological infrastructures reduces the useable agricultural area or disturb their activity. Ecological infrastructures are currently found with crops in most farms, demonstrating that co-existence is not counterproductive. This measure aims at improving these habitats but using a collective and informed-based approach to deliver the maximum benefits and cost-efficiency. Despite, the implementation of actions needs some investment in terms of technical advisory and materials, Nestlé co-fund BAPs.

5. WATER RESOURCES MANAGEMENT

Water resources management consists in a series of practices that aim to encourage farmers to monitor water use, compile information for decision making and optimize its use in their own benefit and of the environment.

AGRONOMIC IMPORTANCE

Optimizing the use of water in agriculture fundamental. Over irrigation leads not only to water resources depletion, but has also direct effects on plant health, vulnerability to diseases and on nutrient availability. Water is expected to be a scarce resource in some EU farming areas where vegetables grow.

The measures included in that chapter do not aim at limiting the amount of water used necessarily, as there are too much variables (such as soil types, annual rainfall and temperatures, microclimates within a same production area, macroclimates within different production areas, difference between early/medium/late varieties, etc.) that make very difficult to fix realistic references.

ENVIRONMENTAL IMPORTANCE

Some of the vegetables targeted in this document grow under warm climates where water may at times be a scarce resource. Agriculture consumes about 70% of fresh water worldwide, and availability is already in question because of foreseen climate change scenarios in the coming years. Water pollution is also a very sensitive issue that can be tackle also by adequate water management.

RECOMMENDED MEASURES

Water Management measures	
4.1.	Irrigation recording sheet
4.2.	Drip irrigation
4.3.	Semi-buried and buried irrigation
4.4.	Decision support tools for irrigation

5.1. IRRIGATION RECORDING SHEET

Description

The first and basic step for monitoring the water used and optimising its use is an Irrigation Recording Sheet that can be easily integrated in the Farm Register Books. Irrigation recording sheets consist in a detailed record of all irrigation episodes within the farms and other relevant data to determine total consumption of water.

For more information on water protection and irrigation management, please refer to the following supporting documents.

Objective

Farmers keep records of the water used for irrigation.

Specific indicator

An Irrigation Recording Sheet is included in the Farm Register Book, including:

- time devoted to each irrigation event, flow rate and total volume used (if the farmer is not on water meters, figures can be estimated);
- the sum of water used during the crop season in total volume and total volume per cultivated ha; and
- monthly rainfall for the whole crop season.

Implementation level

Basic

Required evidence

Irrigation recording sheet included in the Farm Register Books.

Potential constraints and benefits

No technological or economic constraints are foreseen.

5.2. DRIP IRRIGATION

Description

Where water is a scarce resource and water requirements of the crop are high, drip irrigation reduces the total water used to cover crop needs. Additionally, the use of drip irrigation has other benefits: the impact of weeds is reduced due to less soil surface with moisture, so less herbicides are needed; the application of fertilizers is more efficient as they can be used every time irrigation is performed, therefore delivering the right amount of fertilizer, in the right place at the right time.

For more information on water management and irrigation efficiency, please refer to the following supporting document.

Objective

Farmers use the most efficient irrigation systems.

Specific indicator

If water consumption for irrigation exceeds 2,500 m^3/ha/year, farmers implement drip irrigation systems.

Implementation level

Basic

Required evidence

Information on Farm Register Books or pictures that can demonstrate the implementation of the practice.

Potential constraints and benefits

This practice entails additional costs for the farmers (e.g. annual fuel consumption for pumping and annual cost of tubing), but it is a very well-established practice in warmer areas and farmers do appreciate the agronomic benefits of localized irrigation systems.

5.3. SEMI-BURIED DRIP IRRIGATION

Description

Drip irrigation efficiency can be increased if the tubing system is buried (at least 15 cm) or semi-buried (about 5 cm). This way water is released closer to the root system and evaporation is reduced, and as a result water use is optimized.

For guidance on irrigation efficiency, please refer to this supporting document.

Objective

Farmers use the most efficient irrigation systems.

Specific indicator

If water consumption for irrigation exceeds 2,500 m3/ha/year, tubing used for drip irrigation is buried (at least 15 cm) or semi-buried (at least 5 cm).

Implementation level

Advanced

Required evidence

Information on Farm Register Books or pictures that can demonstrate the implementation of the practice.

Potential constraints and benefits

Apart from water optimization, buried irrigation have many benefits, such as a reduction in the risk of wild animals (especially birds and mammals) to damage the tubing, a lower risk of the wind blowing the tubing and less fungal diseases in the plant neck.

Burying (at least 15 cm) tubing has an additional cost compared to non-buried system, due to installation cost and the use of thicker tubing. It also entails a certain risk, as tubing may be blocked and the farmer has a limited access for reparation. In the case of semi-buried (at least 5 cm) systems, these risks are reduced, but also the potential benefits above-mentioned.

5.4. DECISION SUPPORT TOOLS FOR IRRIGATION

Description

Decision-support tools are technologies that can help farmers to decide on crop irrigation needs and activities(e.g. tensiometric probes, multispectral analysis, etc.). These tools are used for measuring the soil moisture at different depths and are sometimes complemented with relevant parameters that allow the farmer to know with high accuracy the water needs of the plants and defaults in their irrigation systems, and make informed decisions using the collected data.

For more information on different technologies and benefits of informed-based decision, please refer to this supporting document.

Objective

Farmers use decision-making systems for fine-tuning irrigation performance.

Specific indicator

If water consumption for irrigation exceeds 2,500 m3/ha/year, farmers use decision-support tools to collect data in the field (can also use information available for another field with the same crop within a radius of 1km around).

Implementation level

Advanced

Required evidence

Irrigation support tools are documented and/or information related to them is available on Farm Register Books. Pictures can demonstrate the implementation of the practice.

Potential constraints and benefits

The cost of some of the specialized equipment used to measure indicators (such as soil and environmental humidity) is probably the most important constraint, although data interpretation can also be complex. However, when this technology is hired, advice services are often included. Collective use of these technologies is a way to reduce costs and tests performed under different situations (different varieties of crops, different plantation times, type of soils, etc.) and may benefit all the farming community. In areas where water is scarce and/or expensive, the saving after irrigation adjustment may compensate the costs.

6. ENERGY EFFICIENCY MANAGEMENT

Energy efficiency management consist in a series of practices that aim to ensure that energy consumption and GHG emissions related to agricultural activities are minimized.

AGRONOMIC IMPORTANCE

Energy is consumed directly and indirectly in all agricultural operations. Direct consumption refers to the energy consumed directly by farmers during agricultural operations, and that in most cases is reflected in their energy bills for fuel, electricity or gas. Indirect energy, such as energy used for manufacturing agricultural inputs is part of the input prices paid by the farmers.

All the energy used entails the release of Greenhouse Gas Emissions (GHG) that contribute to climate change. Agriculture one of the sectors that most contributes to this environmental problem.

Promoting a reduction in energy consumption has a double effect for farmers: it can help to reduce production costs and it will contribute to GHG emissions reduction that will create a much friendlier environment for their activity.

ENVIRONMENTAL IMPORTANCE

The energy used in agricultural operations around the world is in most cases based on non-renewable sources, and the use of these energies entails the emission of GHG to the atmosphere. Energy saving and efficiency should of the first steps towards a drastic change in the energetic model. Although agriculture is the most important emitter of some greenhouse gases not related to energy use (mainly methane and nitrous oxide), energy-related emissions (mainly carbon dioxide), especially when considered both direct and indirect energy consumption, are still very relevant.

WHICH ARE THE RECOMMENDED MEASURES?

Energy and climate protection measures
Use of energy saving devices

5.1. USE OF ENERGY SAVING DEVICES

Description

Farmers perform a number of activities and use equipment that consume different types of energy. This measure promotes the adoption of energy saving mechanisms in production, processing activities and transportation. Examples include, but are not limited to: GPS equipment on tractors, power regulators on irrigation pumps and other motors, and regular maintenance of farm machinery and vehicles.

Objective

Farmers reduce energy consumption.

Specific indicator

Farmers use energy saving devices on mobile or fixed machinery, or can demonstrate that particular actions taken on their farms result in less energy consumption (i.e. adjustment of machinery, specific solution, etc.).

Implementation level

Basic

Required evidence

Visual inspection.

Potential constraints and benefits

Energy saving devices require an initial investment that may be a limitation for some farmers. However, in most cases the resulting economic savings make this investment feasible and benefits are mostly perceived in a reasonable period of time. The increasing cost and competition for energy resources shall also be considered for decision-making in that sense.