

BIODIVERSITY

IN BANANA PLANTATIONS



Coplaca

Cuadernos divulgativos

Biodiversity

in banana plantations

We dedicate this work to two people from whom we learn every day, for many years, to value the importance of biodiversity in agriculture and the need to spare no effort in protecting and vindicating it. All our thanks and appreciation for Rosa Barasoain and Fernando López, from editorial “La Fertilidad de la Tierra”.

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Why this publication?

We believe in COPLACA that it is perfectly viable to grow bananas without a negative impact on people or the environment, and this must be also agronomic and economically sustainable. Disseminating these techniques to produce food that decrease or they even exclude the use of synthetic pesticides is one of the usual tasks in COPLACA.

In the wide and diverse range of situations, environments and conditions present in more than 4500 banana fields of the farmers that are grouped in COPLACA, we want to remark that BIODIVERSITY always finds a fit if it is properly adapted to be a factor that reduce costs and inputs, increasing the quality of the product, of the work and the environment.



Biodiversity

in a monoculture



BIODIVERSITY is a word whose presence is growing in the agricultural language, where it has come from the field of natural ecosystems. In fact, it defines **the presence of a more or less wide range of species plants and animals in a system**, but its implications in agronomy go far beyond that an extensive inventory of species.

It is more than “planting four flowers on the edges” ... Biodiversity should always be attached to the adjective FUNCTIONAL. Because it is not about adding species randomly without reason around the main crop, but to know what is the role of each one, what effects can it have on the system, what relationship it has with other plants, how does its presence affect animal populations (especially insects - both pests and auxiliaries-, arachnids, birds ...), where and how to locate them so that they are more useful, and ultimately, to know the role that individual and collectively have in the agrosystem.

Talking about biodiversity in banana fields can shock a bit, as it is usually associated with the “monoculture” label. However, until the mid-70s it was common to find in Canary Islands other crops associated with it, like citrus or avocados interspersed, papaya or coffee on the margins, as well as potatoes, pumpkins, local varieties of corn and beans, and the walls were used to serve as a support for “bubangos” (a local type of courgettes), sweet potatoes and chayotes. These associations not only optimized the space and diversified the production, but also posed a difficulty for dispersal of many pests, due to the different morphology and physiology of the crops associates. For example, the banana mealybug (*Dysmicoccus grassii*) does not it is the same as that of citrus (*Planococcus citri*); citrus leafminer, *Trioza erytrae*, does not affect banana, avocado or papaya; the powdery mildew is exclusive to papaya and mango, within the tropics, etc ...

These practices were highly recommended agronomically, but they were lost because of the priority of maximizing the production of the main crop, banana, and were eliminated from the system all the components that, apparently, went against that objective.

However, there is actually a rebirth of the importance of biodiversity in agrarian systems. Even the regulations of the European Union aim to promote this practice, so from COPLACA we want to share with farmers and consultants some guidelines for the implementation of biodiversity in banana, beyond associated crops that we have cited and they are already known.



On May 20, 2020, the European Commission published two “Strategy documents”, which are not applicable legislation but it does mark the line that the EU must follow.

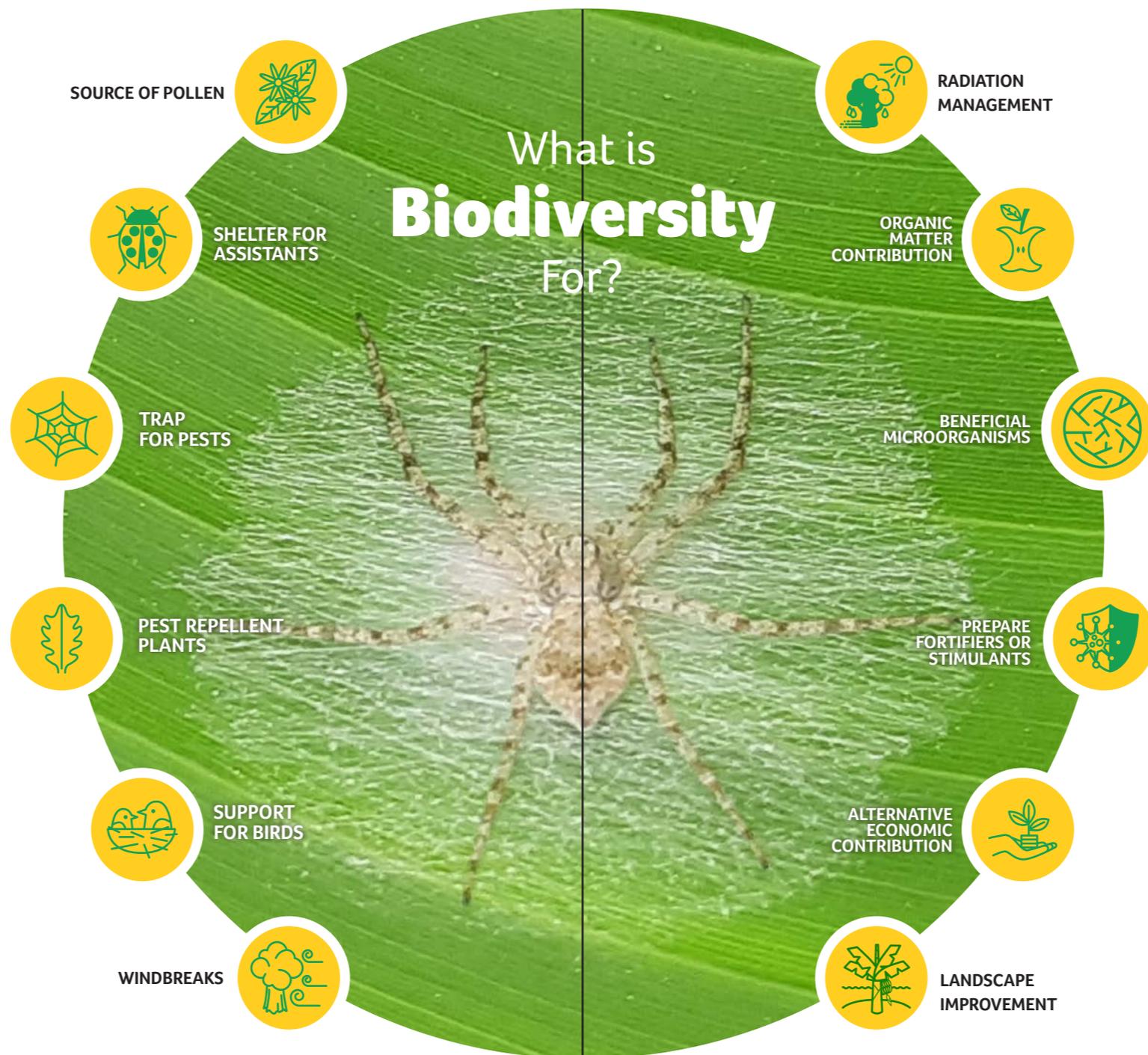
- EU Biodiversity Strategy for 2030 Bringing nature back into our lives.
- A Farm to Fork Strategy for a fair, healthy and environmentally-friendly food system.

Both contain several objectives of protection of the environment, both in natural ecosystems and in agricultural production, among which is the reduction in the use of pesticides and chemical fertilizers, the increase in the area of organic farming or stop the loss of biodiversity to recover nature.

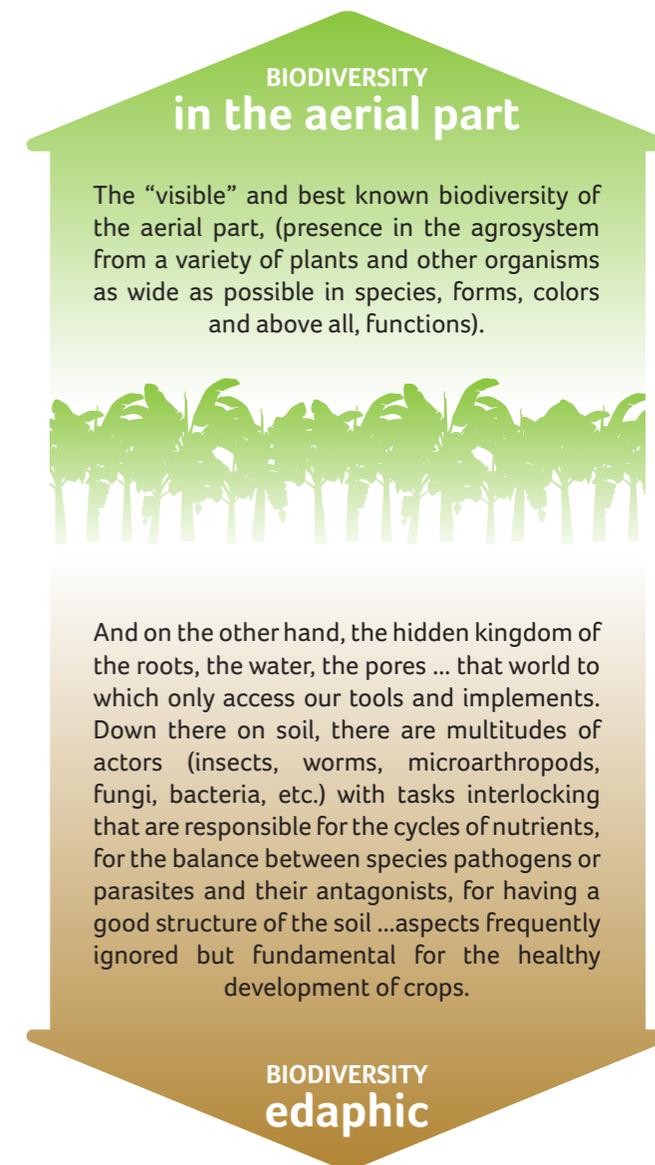


It is not a matter of aesthetics, image or marketing: biodiversity must be profitable for the farm. But in the analysis of this profitability should be included, for example, that pest management based on biological control is not releasing in the environment potentially dangerous substances as they are the active ingredients of pesticides. And this fact should be put in value somehow. Or that the incorporation of a green manure to improve soil fertility is reducing the greenhouse gas emissions from manufacturing and import chemical fertilizers, or those associated with the use of nitrogen fertilizers. Also the beneficial role that it is played for bees can be improved if we allow the presence of melliferous flora associated with main crop. Actually, in any natural ecosystem all components serve for something, but the incorporation of other species in our banana must be done with the basis that its function is positive for the system. Some of them positive functions are listed below, arising from the need to careful and attentive observation of nature by the organic farming to reproduce that in farm management.

- **Source of pollen** to attract biocontrol insects, whose phase larval control pests but in the adult stage it they feed on pollen (lacewings and hoverflies, mainly).
- **Shelter for assistants from predators** (ants).
- **Plant trap for pests** (both to capture them as well as to alert of its presence).
- **Pest repellent plants.**
- Infrastructures to **support birds** (nests, lookouts ...).
- Protection as **windbreaks**.
- **Radiation management** (shade) or relative humidity.
- **Contribution of organic matter** (green manure).
- **Stimulation of beneficial microorganisms** (mycorrhiza, nitrogen fixing bacteria).
- Material to **prepare fortifiers or stimulants**
- **Alternative economic contribution** (coffee, moringa, passion fruit ...)
- **Landscape improvement**



A good starting point is found in one of the objectives of organic production, “**to ensure a system viable agricultural management that contributes to achieving a high degree of biodiversity**”, both in the air (upper environment) and in the soil, because the field of biodiversity includes different levels that are interconnected.





Biodiversity

in the aerial part



The subtropical environment in which banana grows, without extreme temperatures, with a soil rich in matter organic and a fairly high irrigation contribution, propitiates that other plant species claim their presence in the system. In other crops would be considered “weeds”, but the size plantation of the banana tree and the techniques of its management suppose that, under normal circumstances, these herbs do not cause an economic loss. The padding of old leaves covers a large part of the surface, improving conditions humidity and darkness to conserve **biodiversity** from the ground, making it difficult for herbs to emerge, which in banana farms are not considered an enemy. Even there are farms where resistant trample species like **oatmeal**, are sown in the hallways, as the labours in the banana plantation they are simple but continuous throughout the year. Other species fulfill the functions of tapestry, such as **tradescantias** or **commelinas**, avoiding the proliferation of other plants that could compete with the crop or attract pests, but they can also contribute nitrogen to the soil in the case of legumes, such as **vetch**.

The most direct system for implementing biodiversity consists of sow or plant companion plants of the main crop, with the functions we indicated previously.

The shape of the fields will indicate the convenience of placing them in the edges, type hedge, or interlayer the so-called “islands of vegetation” so that the distances between the reservoir plants and the crop are not too long to facilitate predation or parasitism of pests... It is necessary to consider also the geometry of the plot, the slope between them (terraces), whether or not they border other plots, with other crops or with natural/wild systems... all this will be decisive. In the plots of new planting, it is much easier, since the design process and implementation would be incorporated into the general task of stakeout, amendments, installation of irrigation and planting of the plot.

The best solution is to use margins, which are not productive. In those, in some cases, the task would be to rethink the planting line, and install the corresponding irrigation. In the case of farms with drip it could be considered to place a lateral drip tray more to water the hedge, which in no case will have needs higher than those of the banana tree, so it would be enough. On farms with sprinkler irrigation, it is not would justify installing an extra line of sprinklers (they are usually 400 or 800 l / h and with a radius of 3 or 4 m), so a solution it would be for the hedge to take advantage of the water from the sprinklers more external of the plot.

In those cases where the installation of hedges is complicated, it is possible to consider small islands of vegetation associated, for example in some corner of the plot that is more shady and/ or in some point that it was difficult to cultivate, although in large plots it would be possible to substitute some banana plant by a groupe of plants by way of forest-island. It is a question of assessing whether the production of bananas that we are going to stop having due to the absence of that or those plants can be offset by the beneficial functions of these other species, although in the absence of research or trials in this regard this should be considered only as a solution secondary, or in the case of large farms where that difference is not noticeable.

It must be taken into account that the current regulation (POSEI) contemplates that the inclusion of productive crops within of the enclosure for which help is perceived by surface supposes a reduction of the same proportional to the occupied land





There is also the option of “corridors”; in the farms it is common to find walls that separate one terrace from another at a different level, or old ditches (“drains”) that were used before for the distribution of water around the plot. Both constructions are susceptible to housing some ecological infrastructure: stone walls can serve to install climbing species that cover it and at the same time have the function of attracting and harboring auxiliaries (such as ivy), while the disused culverts suppose a “flowerpot” line that also allows the implantation of species of small and medium size.

A last option is the use of pots or containers. In the production of bananas, the use of inputs in 20 liters containers is frequent and in some cases 200 or 1000. Normally they are not phytosanitary products (their management is carried out through the SIGFITO system) but nutritional, therefore it is not easy to manage them, not only because the authorized managers charge fees, but also because they do not usually collect on the farm, and must be transported to their installation. The use of these containers (not pesticides, we repeat) as flower pots, not a bad idea to introduce on the farm some species of simple cultivation, mainly of the family of the aromatic plants.

A particular case is the plantations that we can do as support for the birds. In corners, edges and boundaries, without invade the crop surface, trees or shrubs species can be planted to serve as a shelter, nest or watchtower of vigilance. Insectivorous species, such as blue tit, they are a perfect ally for the control of pests of this type. The case of bats, mammals, is already more peculiar by their nocturnal habits feed on noctuids, such as the geometridae worm (*Chrysodeixis chalcites*). It must also be considered that in times of summer or dry periods, the banana tree is an agrosystem with the presence of water. We must provide the birds with points to drink

Biodiversity on soil

The banana is a crop that normally grows on a soil rich in life. The traditional practice of “estercolado” (addition of manure) is one of the most deeply rooted practices in the farm, and it is common to find contents of 3 or 4% of organic matter. The works of Professor Antonio Bello Pérez and his team demonstrated that it provides an environment that favors the microorganisms responsible for keeping out large number of pathogens (mainly nematodes, but also phytopathogenic fungi and part of the seed bank of weeds). This positive effect is due both; to the increase in the population of beneficial organisms (responsible for decomposing organic matter) as well as the products that excrete into the environment, which are usually stimulants root growth and soil structuring, without forget the gases emitted in decomposition, highlighting the nematostatic effect of ammonia compounds and sulfur. In some cases, the positive factor is the increase of the temperature that produces the microbial activity decompose fresh organic matter, and it can be strengthened with techniques such as biosolarization, covering the surface with polyethylene, always bearing in mind that we are generating a waste that requires further management, but that inconvenience may be tolerable versus the benefit that involves applying the technique for the control of weevil and production advance, as evidenced by trials of the Agricultural Service of the Cabildo de Tenerife. Definitely, the basis is the wealth in organic matter, since a soil poor is not able to sustain these processes and is subject to to the continuous threat of pathogens that do not find antagonists or difficulties to their action. This organic matter must be of good quality, providing nutrients in the short and medium-term to crops and organisms living in the soil, and also maintain a humified fraction, which act as a structuring agent, a carbon reserve and a contribution slow release nutrients.



Guidelines for the proper functioning of your BANANA AGROSYSTEM



YOU CAN PROMOTE BENEFICIAL FAUNA...

- 1 Through flowers that attract pollinators.
- 2 Through flowers that attracts biocontrol insects and mites.
- 3 Planting trees that attract insectivorous birds and help improve the soil.
- 4 The local flora present can help you in the performance of all these guidelines.
- 5 Other crops contribute in the same direction and they can also provide complementary incomes.
- 6 Use "trap" and/or "repellant" vegetation to fight pests.
- 7 Some plants allow you to provide fortificants to the crop (extracts and macerations).
- 8 Biotopes are an ideal system for integrate birds, insects and frogs into their agrosystem.

YOU CAN BOOST SOIL FERTILITY...

- 9 Maintaining an adequate level of moisture in the soil.
- 10 Provide organic matter, preferably from local origin.
- 11 Improve the conditions of your land by mulching with the crop residues.
- 12 Some animals and poultry may contribute to the soil fertility.
- 13 Microorganisms will arise in an environment of suitable humidity and temperature and this **EDAPHIC BIODIVERSITY** will promote a fertile soil.

PROTECT YOUR CROP

- 14 Through vegetation that acts as windbreaks.
- 15 Through walls and windbreaks.

COMMIT TO SUSTAINABILITY

- 16 Bet on the energy self-sufficiency of your farm.



Promoting biodiversity is added to the **CONDITIONALITY** criteria. You must also assess what role can play your farm in improving the landscape. **Consult our technicians and administrative staff.**



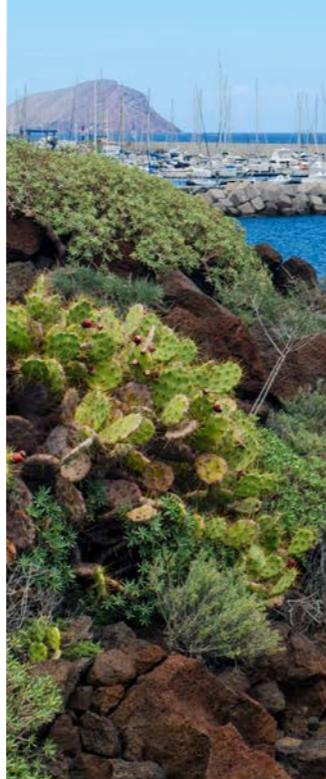
Which species to choose?

It is necessary to emphasize the need to consider the variability of conditions in the cultivation of banana in the Canary Islands, depending on the island, elevation, orientation... The plants that we put in the system to contribute biodiversity should not hybridize with the populations or local subtypes, as the islands' high native biodiversity is based on this variability ... Cannot be transported plants or seeds from one island to another, or within the same island, without ensuring that this will not cause an impact, especially with genres with wide representation and variety that can include more or less local biotypes, such as *Echium*, *Lotus*, *Euphorbia*, etc ... It is important to review and, where appropriate, consult with specialists, which species can be used (or not) in a certain area..

Having clarified this point, when choosing the species it should be clear that the main objective is to attract and welcome the auxiliaries, whose adult states feed on pollen, so they must be incorporate plants that, together, cover a period of flowering as wide as possible throughout the year. Nevertheless, not only the presence of flowers is important, but also choosing either the plant-auxiliary association. Although some of these associations will be more unspecific, on many occasions the choice of the plant species will be key to favor the presence of specific auxiliaries, and poor selection can be even counterproductive. To know what auxiliaries are convenient to host should take into account which airborne pests cause problems in cultivation. The main ones are the cochineal (*Dysmicoccus grassii*), the whitefly (*Aleurodicus dispersus*, *A. floccissimus*), mite (*Tetranychus urticae*), various species of thrips, some caterpillars (*Chrysodeixis chalcites*, and *Opogona sacchari*). This type of pest resembles the present in most horticultural crops, more than those of fruit trees, because the banana tree is still a grass, big and juicy, but definitely grassy. And in handling these pests can help some general assistants like the larvae of hoverflies, lacewings, coccinellids, Orius... and other more specific ones like ichneumonid wasps that parasitize lepidopteran larvae, or the phytoseids enemies of the spider mite and thrips in some cases.



Protect native flora



Plant vegetation that attracts helpers



Consider the height and size of the plants



Plant or maintain vegetation to serve as trap plants



Another factor to consider is the height of these companion plants. The banana tree can measure up to about 4 m in high, according to varieties, and their aerial pests can occupy or not all that mass. For example, mites and thrips are especially harmful in bunches, the whitefly is clustered on the underside of leaves, where photosynthesis decreases with their excretions and associated sooty mold, the Lepidopteran larvae attack both small plants like newly emerged bunches, but the mealybug can be found throughout the plant, even in the roots ... So the plants that host the auxiliaries should not be only shrubby, like the traditional ones and almost obligatory lavender, rosemary, calendula or evergreens, or the not so mentioned fennel and parsley (Umbelliferae are excellent), geraniums or onions, but some taller ones. One of the species of this type that we suggest to implant is guaydil (*Colvolvulus floridus*), which can exceed 2 m in height, and has a flower and pollen practically all year round. It is also interesting spurge (*Ricinus communis*), a reservoir of phytoseidae, the sunflowers (*Helianthus* spp.) and sonchus (*Sonchus* spp), of the compositae (Asteraceae) family, with large chapters florals that especially host coccinellids. Something else exotic is "Jerusalem artichoke" or "tupinambo" (*Helianthus tuberosus*), similar to sunflower, with flower heads abundant in pollen and usable for its tuber.

It is important in the Canary Islands of the group of tajinastes (*Echium* spp.), of which the best known, protected and unusable is the Teide red tajinaste (*E. wildpretii*), but there are other species used in gardening also with a flowering abundant in spring, which are a refuge for the Orius, same as the balo (*Plocama pendula*), although this is suitable mainly for south orientations.

There are also ferns, suitable in humid environments in which thrips usually appear, since they host to their predators. There are crucifers like mustard, the pegleta or others fodder radishes, legumes such as feverol or vetch, chicharaca ... or tropical legumes like canavalia. On the other hand, there are plants such as the altabaca (*Dittrichia viscosa*), which It can be complementary to the others, since it is a refuge of *Nesidiocoris* (that although it feeds mainly on *Bemisia tabaci* or *Tuta absolute* eggs, there are also references predation on spider mites and thrips)..





Logically, these companion species of the banana have their needs for water and nutrients, but they are perfectly compatible with the contributions made to the main crop. In most situations it is not feasible to install a separate irrigation. In farms with drip, they can be put blind hoses and puncture in the places where the space allows us to put some of these dropper low flow so that uniformity is not affected of the rest of the system. In the farms with aspersion it is much easier, for the high rainfall reaches all the planted area. In any case, it is important to take into account, at the time of design, that it should not interfere with the regular work of the farmer. It is also interesting to use the infrastructures already present on the farm; stone walls, old culverts or irrigation distribution tanks that no longer are used, they can be a suitable place to plant these species, or even to install a biotope or drinkers to the birds.

Because there are other animals that can help us improve the sustainability of production ... It is not the subject of this publication (perhaps it deserves a specific one) about in the guidelines for the integration of livestock with the crop banana, either sharing space (chickens) or associated with farms (hairless sheep, cows ...). Nevertheless, It should be noted that, depending on the location of the farm, we will find not only insects, but also other auxiliaries such as blackbirds, blue tit, canaries, partridges, spiders, bats, shrews ... And if we go one step further and install biotopes, in addition to allowing birds to drink, we will be creating a suitable habitat for frogs (predators of ants that carry and enhance the mealybug) or dragonflies, also predatory.

Finally, it cannot be ignored that there are authorized products in organic production, such as spinosad or fatty acids potassium, which are harmful to some auxiliaries. The spinosad is toxic to hymenopterans which, in addition to bees, including ichneumonid wasps or Trichogramma acheae, an effective egg parasite of the caterpillar Chrysodeixis chalcites. Therefore, the conservation of biodiversity happens first by eliminating phytosanitary treatments, even with products authorized by ecological agricultural regulations.



Adaptar las nuevas plantas
a las condiciones del riego y
de las labores en la plantanera



Aprovechar la presencia
de animales y de las aves



To finish, we want to highlight especially, for what they suppose of teaching and informative examples, the implanted experiences of diversity associated with Banana of the Agrarias Technical Schools of Arucas, in Gran Canaria, and of Tacoronte, in Tenerife, as well as in the Finca La Quinta Roja, of the Cabildo de Tenerife, which we hope will serve to disseminate these practices in the sector.



Bees and banana

Banana is a parthenocarpic crop, this means that every fruit we eat is a developed ovary without having been pollinated. However, it is common to find bees in banana fields, especially in the environment of the bunches when they still have the flower, located at the end of the fruit and that must be removed one by one manually to prevent rotting each banana. Bees come to the nectar secreted by the flower, although they do not fulfill a pollinating function. In addition, the banana is an irrigated agricultural system, and it does not hurt to reflect that in times of drought may become the only chance to find melliferous flora, if among the companion species that we have mentioned we include some with this function, to serve as support for the survival of these insects. Plants such as borage, heartwort (Lotus spp.) or many of those already outlined to attract helpers, are at the same time melliferous flora, so it materializes a perfect collaboration of the banana sector with beekeepers doing much-needed work..





Some species suggested for the handling of the biodiversity in the banana tree.

The species listed in this work, in principle and except for error or omission, are already present in Canary Islands and not subject to authorization administrative for its manipulation or spread. In any case it is advisable to check this in case of doubt.



Locksmith
Sonchus spp.
Family: Composite
Reference: Hidalgo 2016
Auxiliaries: Orius
Flowering: End of summer
Carriage: 1m



Lobularia
Family: Cruciferous
Reference: Hidalgo 2016
Auxiliaries: Various
Carriage: < 1m



Acebuche
Olea
Family: Oleaceas
Reference: Hidalgo 2016
Auxiliaries: Orius and Lacewing
Carriage: > 3 m



Jasminium
Family: Oleaceas
Reference: Hidalgo 2016



Brooms
Teline, Chamaecytisus, Adenocarpus
Family: Legumes
Reference: Hidalgo 2016
Auxiliaries: Hymenoptera and Diptera



Lotus
Family: Legumes
Reference: Hidalgo 2016
Auxiliaries: Hymenoptera and Diptera
Carriage: < 1m



Ononis
Family: Legumes
Reference: Hidalgo 2016
Auxiliaries: Hymenoptera and Diptera



Chritmum
Sea fennel
Family: Umbeliferas
Reference: Hidalgo 2016
Auxiliaries: Coccinellids and Neuroptera
Flowering: End of summer
Carriage: < 1m



Echium
Family: Boraginaceae
Reference: Hidalgo 2016
Auxiliaries: Orius
Flowering: Summer



Myosotis
Family: Boraginaceae
Reference: Hidalgo 2016
Auxiliaries: Various



Aromatic
Micromeria, Lavandula, Cedronella, Salvia, Teucrium, Bystropogon
Family: Labiadas
Reference: Hidalgo 2016
Auxiliaries: Various
Carriage: < 1m



Olivarda
Ditrichia viscosa
Family: Compuestas
Reference: Porcuna 2010a
Auxiliaries: *Macrolophus caliginosus*
Flowering: Sep - Nov
Carriage: 1 m
Remarks: toxic leaves



Nettle
Urtica urens and U. dioica
Family: Urticaceas
Reference: Porcuna 2010b
Auxiliaries: Coccinellidos, Sirfidios, Anthocorids ...
Observations: Use in maceration



Rockrose
Cistus spp.
Reference: Porcuna 2011b
Auxiliaries: Dicyphus, Macrolophus and Ligus
Flowering: Feb - May
Observations: Pollinators



Wild fennel
Foeniculum vulgare
Family: Umbelliferae
Reference: Porcuna 2011c
Auxiliaries: Syrphids, coccinellids
Flowering: Summer
Width: 1-2 m
Observations: Dry stems, shelter



Facelia
Phacelia tanatecifolia
Family: Boraginaceas
Reference: Porcuna 2011d
Auxiliaries: Syrphids, lacewings
Flowering: Summer
Observations: Pollinators refuge



Mastic
Pistacia lentiscus
Family: Anacardiaceas
Reference: Porcuna 2012a
Auxiliaries: lacewings, phytoseids and Anthocorids



Mercurial
Mercurialis annua
Reference: Porcuna 2013
Auxiliaries: Antocoridos and syrphids
Flowering: winter
Carriage: < 1m





Trebina
Oxalis pes-caprae
Reference: Porcuna 2014a
Family: Oxalidaceae
Auxiliaries: *Amblyseius barkeri*,
Coccinella septempunctata
Flowering: spring
Carriage: < 1m



Tarajal
Tamarix canariensis
Family: Tamaricaceae
Carriage: 2-3 m
Protection against wind and sea.
Bird shelter.



Calendula
Calendula officinalis
Family: Composite
Reference: Porcuna 2014b
Auxiliaries: Syrphids and coccinellids
Flowering: all year



Guaydil
Convolvulus floridus
Family: Convolvuláceas
Carriage: 1-2 m
Lots of pollen most of the year.
Refuge auxiliaries.



Cineraria
Cineraria maritima
Family: Composite
Reference: Porcuna 2014c
Auxiliaries: Ants (trap), coccinellids
and syrphids
Carriage: < 1m
Observations: Pollinators



Granadillo
Hypericum canariensis
Family: Hypericaceae
Carriage < 1m
Has medicinal use, attracts auxiliaries
and birds.



Cupressus
Cupressus sempervirens
Family: Cupresaceae
Reference: Porcuna 2015b
Auxiliaries: Cryptolaemus and birds
Carriage: > 3 m
Observaciones: Eye in the shade and
nutrition. Own fertilizer.



Vetch
Vicia sativa
Family: Legumes
Upholstery and soil improver.
Attractive flowers for bees.



Ivy
Hedera helix
Family: Araliaceae
Reference: Román 2008
Flowering: early winter
Carriage: > 3 m
Observaciones: Invasive. In hedges
already installed or walls.



Purslane
Portulaca oleracea
Family: Portulacáceas
Upholstery and honey flowers.



**Sunflower, Jerusalem
artichoke**
Family: Composite
Carriage: > 1m
Large floral chapters. Attract
hoverflies, coccinellids, anthocorids,
Diptera ...



Balo
Plocama pendula
Family: Rubiaceae
Carriage: 1-2 m
Southern atmosphere. Orius hatchery
(predator of thrips), windbreaker and
bird shelter.



IMPORTANCE OF NATURAL ENEMIES



Flowers with pollen or nectar attract adults of natural enemies.



Auxiliary insects lay eggs in the flower environment.



The larvae or young prey on or parasitize to pest species.

Identify in your farm the natural enemies of interest in banana cropping



Hymenoptera



Hymenoptera nest



Diptera



Coccinellids



Neuroptera



Predatory bug



Hoverflies



Lepidoptera



Pollinators



Reptils



Frogs



Birds



INDEX

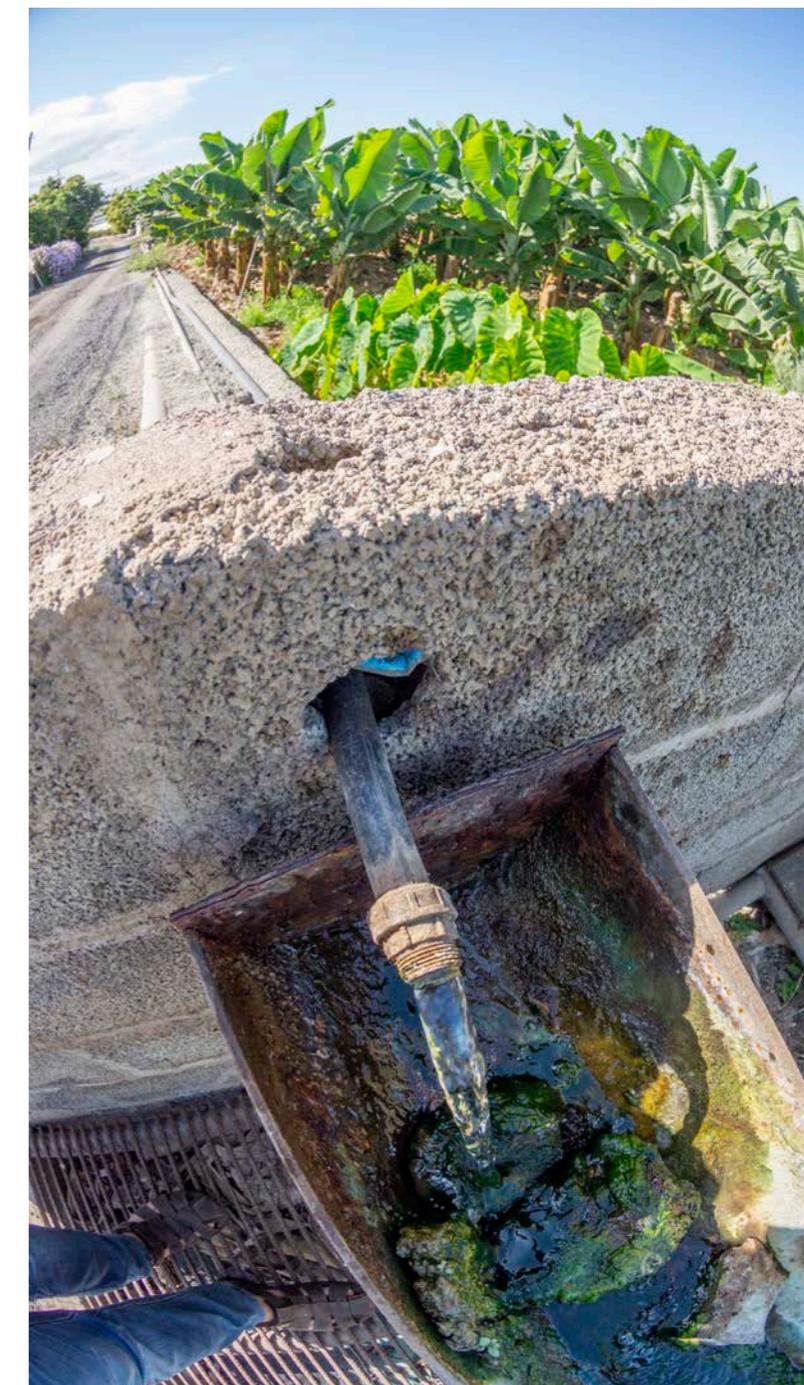


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If these lines have managed to arouse the interest of someone who has the possibility of improving the biodiversity of your farm and also have found some useful indication to do so, we will almost have fulfilled the objective. We propose that you go one step further and plant trees, each according to its circumstances, location and media. There is always the option to choose between avocados, barbusanos, plums, dragon trees, and so on the whole alphabet up to the sapodilla. Trees give us oxygen and shade, fruit and wood, protect us from the wind and serve to the birds nest or to wait by their side for the person we love.

“Nothing should be called growth if the trees do not also grow there”
Joaquín Araújo





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