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Bees and Permapiculture: balancing agricultural ecosystems

Abejas y Permapicultura: equilibrio de los ecosistemas agrícolas

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Abstract: Permaculture dates back to the origins of man, fauna and flora that coexist on planet earth, each with a mission that contributes to maintaining the harmonious balance of ecosystems, for which, bees, the noble laborious, play a fundamental role in the pollination of agricultural crops and the diversity of plant species, floral, timber, fruit that make up the agro ecosystems, without which, the food of man would be limited; So much so that permapiculture safeguards the natural habitats of bees to guarantee their productivity, preserve their health and prolong their life; in this context, the objective of the work delved into the importance of permapiculture to maintain the balance of agricultural and agroforestry ecosystems, nature and mother earth as a whole. Based on a methodology of documentary review in primary and secondary sources, books, manuals and scientific articles, live recorded workshops and recorded interviews of experts, it was possible to obtain as results a characterization of permapiculture to determine that its importance lies in the rescue of ancestral knowledge that respects the natural environment of bees as producers of food and health for men. For these reasons, it is necessary to renew the traditional beekeeping practices oriented to an intensive beekeeping, towards the permapiculture that will guarantee the permanence of the brides of the sun on earth, and consequently to all the species, of which human beings are also part, being now, the moment to rethink and practice the filial love for the permapiculture.

Keywords: Apis melliferae bees, beehive, agricultural ecosystems, nature, permapiculture.

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Resumen: La permapicultura se remonta a los orígenes del hombre, la fauna y la flora que coexisten en el planeta tierra, cada uno con una misión que contribuye a mantener el equilibrio armónico de los ecosistemas, para el cual, las abejas, las nobles laboriosas, juegan un rol fundamental en la polinización de los cultivos agrícolas y la diversidad de especies vegetales, florales, maderables, frutales que conforman los agro ecosistemas, sin las cuales, la alimentación del hombre se vería limitada; tanto así que, la permapicultura salvaguarda los hábitats naturales de las abejas para garantizar su productividad, preservar su salud y prolongar su vida; en tal contexto el objetivo del trabajo ahondó en la importancia de la permapicultura para mantener el equilibrio de los ecosistemas agrícolas, agroforestales, la naturaleza y la madre tierra toda. Basándose en una metodología de revisión documental en fuentes primarias y secundarias, libros, manuales y artículos científicos, talleres en vivo grabados y entrevistas grabadas de expertos, se pudo obtener como resultados una caracterización de la permapicultura para determinar que su importancia radica en el rescate del saber ancestral que respeta el entorno natural de las abejas como productoras de alimento y salud para los hombres. Por tales razones, se precisa renovar las prácticas apícolas tradicionales orientadas a una apicultura intensivista, hacia la permapicultura que garantizará la permanencia de las novias del sol en la tierra, por consecuencia a todas las especies, de las cuales los seres humanos son parte también, siendo ahora, el momento para recapacitar y practicar el filial amor por la permapicultura.

Palabras clave: abejas Apis melíferas, colmena, ecosistemas agrícolas, naturaleza, permapicultura.

1. Introduction

The brides of the sun, the golden princesses, the winged pharmacists, and other adjectives given to honey bees, are marked recognitions that people who have been closely following their laborious day by day, give them, as a way to praise their exemplary work organization, their food and medicinal production, their sacrifice of life for the very life of human beings, animals and plants, because the time of the planet and humanity is in direct dependence on the survival of their species.

Numerous records found in various locations around the world attest to the existence of bees, foragers and the activity involved in managing and harvesting the production of winged honey bees (Lino, 2002). (Lino, 2002)However, this activity, which was traditionally called apiculture, is currently differentiated from api permaculture or permapiculture, which has been the ancestral practice of the knowledge

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of ancient peoples, lordships, tribes, communities and others, throughout the world.

And the fact is that api permaculture starts from the guiding principle of respect and harmony for the work of the winged Apis species, from the observation of what they do and how they do it to learn how they work to produce their food which are honey and pollen for the entire adult population, royal jelly that feeds the queen and the larvae, wax as the basis for the production of honey, propolis which is the medicine against diseases to which the hive may be exposed (Alvarez et al., 2022).

Work from which, once the honey production is ready, as the main product produced by the bees, the renewed api permaculturist, can benefit economically, food and medicine, because in addition to honey, pollen harvesting, propolis tincture elaboration and other derivatives as products that combine food and medicine, can be produced to be marketed, from the work and production of the entire hive.

There are several products and by-products that the api permaculture production can provide to the api permaculture producer, however, it is the spirit of wisdom that assists him to promote creativity in him, to elaborate from nutritious honey-based foods such as chocolates, nougats, snacks, ice cream, candies, desserts, among others; cosmetics such as soaps, facial creams, shampoo, ointments and medicinal creams based on wax, propolis and medicinal plants, as some examples of the various products that can be made from the production api permaculture. In this way, mother nature in her maternal wisdom welcomes such wonderful living beings; bees, producers of the most used, consumed and artificially copied metabolites in the history of mankind; honey, royal jelly, propolis, pollen, wax and apitoxin. (Alvarez, 2022).

However, as time goes by and in different spaces, bees are facing a threat that is killing their species, since:

> In agricultural landscapes, there are many environmental disturbances on native pollinator and plant communities due to intensive cultivation practices that are unstable in time and space. Consequently, the remaining areas of natural habitat (those most favorable to native bee species) are few in number, isolated, small in size and with limited flower diversity (although higher than in crops). In addition, many mechanical and chemical treatments are aimed at limiting non-cultivated plant species because of their

> potential damage as weeds for crops. In this context, the impacts associated with the massive introduction of a species into communities can be exacerbated (Geslin et al., 2017).

This problem has been dragging on and has increased with the practice of intensive beekeeping, whose domestication mechanism applied to bees has brought economic benefits to beekeepers, but whose environmental impact is destroying the populations of native bees and honey bees native to tropical ecosystems. In this sense, and as Macías et al., 2022) refers in their textual notes on rural beekeeping as an eco-friendly complement to traditional agriculture, it is necessary then:

> To return our gaze to the agricultural fields, to the agro-forest systems, to the natural environment of hills and valleys, of rivers and marshes; to put a little bit of love to recover them, is part of what mother earth demands from the human being that she shelters; the combination of sowing and harvesting the land respecting the work of the bees is one of the ideal alternatives to begin the rescue tasks, through the work of such noble insects, of the winged pharmacists, of the servile workers, beginning to value the effort, the time and the work that demands them to travel kilometers to pollinate so many types of crops and thus extract what will be their food, to repay us even more, through the wonderful and therapeutic products of the beehive (p.749).

Which means practicing beekeeping and agriculture of not doing: Permaculture, which is not an option, it is the path that leads to the recovery of species, both plants and animals: endemic crops and native insects that are bees, which leads to respect for their habitats, their ways of life and work, of what they have to teach, because they have never needed man (Perone, 2009), on the contrary, more and more is who will need these beautiful winged. Therefore, the purpose of this research was focused on determining the importance of Permapiculture that, together the bumblebees and the permaculturist api carry out to maintain the balance of agricultural ecosystems, agroforestry, nature and mother earth as a whole.

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Materials and methods

A review of various documents such as manuals, scientific articles, books, memoirs, expert conferences, recorded courses, workshops, recorded interviews, master's and doctoral theses, was carried out to deepen the knowledge of api permaculture; however, it should be noted that there was a wealth of material that speaks of the beekeeping experience, and very little on api permaculture documented in articles, books, reports or fourth level theses.

In this context, we worked with the literature found and especially with the experience of the Argentine expert in api permaculture Oscar Perone, exposed in workshops, which is duly documented in electronic media recorded and available on the web.

Result

As stated by Weiller (2000)in his book about the bees and the man, sometimes the feelings overwhelm us, some men, when meeting the bees express themselves in such an understanding and expressive way as in these verses of Hilde Domin "Who would be like the bee, who feels the sun also through the cloudy sky, who finds the way to the flower never losing the direction, to this one the fields would appear in splendor; however short he might live, he would seldom weep" (Domin, 1997 cited by Weiler, 2000), for as he also expresses it, man has always been fascinated by bees, one of the poetic definitions being the one inspired by Perone to describe them as:

> Bees are the poetic thoughts of God, flying from beauty to beauty, offering marvelous gifts for everyone in doing so, that is the sacred mission of the bees flying from flower to flower pollinating them, offering the plants the possibility of procreating, of giving reproductive energy to the plant life, helping it and thus maintaining biodiversity, helping to preserve nature as we know it so far, and producing with this great and sacred task the most powerful and healing food products known as pure honey and bee bread, not for nothing is it said that beehives are the pharmacies of nature. (Perone, 2011).

And, similarly, as Maeterlinck rightly expresses it in his work The Life of Bees (1999)man has been assisted by the profanation, "before intuiting their secrets, before impregnating ourselves with the atmosphere, the perfume, the spirit, the mystery of those industrious

virgins, the blond little birds, the daughters of Aristeo" (p. 15), when he marveled at them in a picturesque village landscape of Zealandia:

> There they were, at the bright crossroads where the aerial routes converge and depart from dawn to dusk, where the busy and sonorous swarms travel from dawn to dusk, all the perfumes of the countryside. There one would listen to the happy and visible soul, the intelligent and musical voice, the joyful crackling of the most beautiful hours of the garden. There one would learn, in the school of the bees, the designs of omnipotent Nature, the luminous relations of the three kingdoms, the inexhaustible organization of life, the morality of hard and disinterested work, and what is worth as much as the morality of work: the heroic workers taught also there to enjoy the somewhat vague taste of leisure, underlining, as it were, with the fiery strokes of their thousand little wings, the almost imperceptible delights of those immaculate days that revolve on themselves in space, bringing us nothing but a transparent world, empty of memories, like a too pure bliss (p. 18).

Being so much their nobility, that for Perone (2012), in reality, "bees do not gather honey, bees give life to life", understanding that bees are not prey animals, bees are not defensive, bees are loving, because if we do not bother them, they never bother us, they never bother us and if not, we must stop to observe how they coexist with us in the cities, they drink and forage in the flowers of the parks and gardens, man is frightened, they do not even look at them, thus, the cases of stings occur because they were first bothered by man... (Perone, 2012). (Perone, 2012).

Bees, threats they face

According to history, Apis mellifera, also known as the honey bee, arrived in the American continent in 1956, having been known since the Mesoamerican cultures and the Spanish colonization in the 1760s and 1770s; but it was not until the 20th century that beekeeping became economically active. This species is polylectic, which means that it is a great honey producer due to its ability to collect nectar, pollen and resins according to the flowering of the place (Baena et al., 2022).

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The global assessment report on biodiversity and ecosystem services reveals that ancient Mayan and Egyptian texts recognize the vital importance of bees for the survival of human conglomerates across the planet in their different eras, as the honey bee Apis melifera is the pollinating insect with the greatest presence in the various continental territories, contributing to food security (Brondizio et al., 2019).

Thus, when animals and insects collect pollen from flowers and spread it, they allow plants, including many food crops, to reproduce, and although birds, rodents, monkeys and even people pollinate, the most common pollinators are insects, and among them, bees (Brondizio et al., 2019), as they contribute 25% to the pollination of various species of flora, hence the essential of their presence in nature that has promoted several researches for their genetic conservation (Vásconez, 2017).

Apis mellifera have great adaptability in various climates (Suasnávar et al., 2018), although they do better in warmer environments; but like any pollinator is predisposed to attack by other insects such as bumblebees, mites, diseases and environmental pollution, being more resistant depending on the conditions of the queen bee that determines the strength of the entire colony (Acosta, 2019). Their characteristics vary according to the locality where they are found and this is directly related to their haplotype) and this, in turn with the climatic adaptation and the capacity of resistance to diseases of the hive (Tibatá et al., 2017).

Honey bees have a life cycle that depends on their role, so the queen bee lives less than the worker bee and the worker bee lives less than the drone, as shown in Table 1.

Table 1. *Apis mellifera life cycle*

Cycle	Queen bee	Worker bee	Drone bee
Egg	3 days	3 days	3 days
Larva	5.5 days	6 days	6.5 days
Pupa	7.5 days	12 days	14.5 days
Total	16 days	21 days	24 days

Note. Taken from Suasnávar et al, (2018).

Linnaeus in 1758 described the honey bee, from there on, several subspecies have been found all over the planet, in a diversity of climates, from cold and icy, to temperate and warm. (Acosta, 2019). The taxonomic classification is shown in Table 2 below:

Table 2 *Taxonomy*

Kingdom: Animalia	**Class: Insecta**	**Family: Apidae**	**Species: mellifera**
Phylum: Arthropoda	Order: Hymenoptera	Genus: Apis	

Note. Taken from Borbor (2015).

Currently, bees are facing a potential threat, thus, according to UN information (2022)In recent years, bee colonies have been increasingly reduced, one of the main causes being the excessive use of agrochemicals on farms and agroforestry systems, intensive agriculture using machinery and equipment, as well as the extreme climate change that is being experienced, not only pose a threat to the endemic flora, but also to the fauna that includes pollinating insects such as honey bees, which, by decreasing together, endanger the livelihood of mankind.

Environmental conditions such as increased temperature and humidity directly influence the work of the honeybee in the plant-pollinator network, including the decrease in plant diversity (Giannini et al., 2015); furthermore, negative impacts to the honeybee may increase in more vulnerable ecosystems such as protected areas, islands, or those resulting from natural areas in intensive agricultural extensions (Geslin et al., 2017).

Another factor that affects them is air pollution, which has a direct impact on the aggressive decline of the honey bee population; in the U.S. alone, in the last decade there has been a 44% decrease in the last five years. Air pollutants such as hydrocarbons produce chemical changes that mix with the aromatic molecules released by flowers, which are the signals that bees follow to collect nectar, causing them to become confused and taking much longer to locate them for pollination (Cheng et al., 2020). Some of these impacts are illustrated in Figure 1 below.

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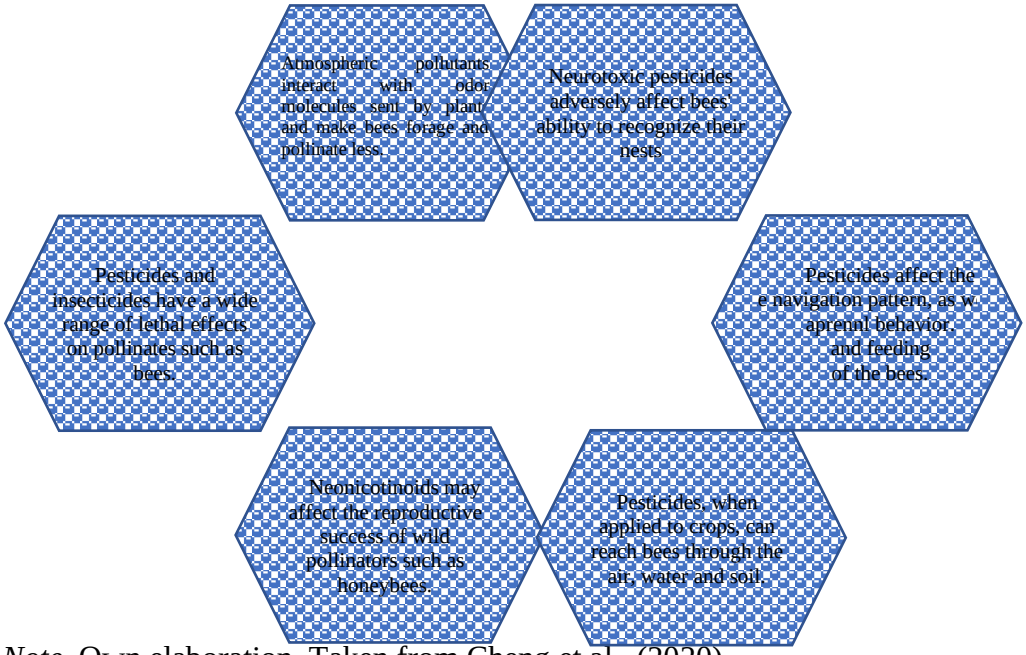
Figure 1. Negative impacts on honey bees



Note. Own elaboration. Taken from Cheng et al., (2020).

Bees, contributions to the natural balance

On the other hand, bees have a beneficial impact on agricultural ecosystems, as they are considered the most efficient pollinating insects, however, the Apis mellifera species has undergone genetic alterations with the particular objective of reducing their aggressiveness and making them tame to be able to manage them in an apiary, Since for the purpose of pollinating large agricultural extensions, transhumance is used to transport the bees to the sown extensions, the handling and transfer of Africanized bees is very difficult for them because they are more stressed than the European bees. This leads to greater colony avoidance and mortality, leaving the beekeeper with weak colonies and fewer hives to rent. In addition, stinging accidents to agricultural workers increase with Africanized bees, which makes their management difficult and compromises future income for the beekeeper (Guzman et al., 2011).

According to the experiences of intensivist beekeepers who are dedicated to the mobilization of hives dedicated to crop pollination, Africanized bees swarm frequently, abandoning the hives, which brings heavy losses to beekeepers (López, 2019)For these reasons, beekeepers opted to replace queen bees with those of European origin, achieving

that, due to their gentleness, the hive also becomes tame and can support the continuous transfer of their hives to pollinate agricultural extensions, an action that has also contributed to surpass the number of hives they had before the change.

However, it is necessary to state that, according to the experience of permaculture or extensive beekeeping, the endemic bee of the tropical zones whose characteristics are very similar to the African bees, has a very resistant genetics to its natural environment, since nature is so wise that it has provided the strength and vigor it needs to live in the climatic conditions of the South American tropic north and center, since the south of the continent is colder and temperate, however, the honey bees of that area perform quite well in such ecosystems.

Thus, when the beekeeper becomes aware that he can spend time and invest money in buying tame queens to appease the aggressiveness of the hive, it does not guarantee that the hive will be stronger for longer, less sensitive to pests and diseases, artificially fed and constantly requiring the beekeeper's intervention, which does not correspond at all with the untamed nature of bees, since they were born to be free and in their complete freedom they travel, work and live in their chosen homes, cohabiting with other species in diverse environmental settings, and that by their very nature, their work is faster, their production is more abundant and their life span is longer.

And, as bees travel miles to collect nectar from the flowers of fruit, timber, floral, short-cycle and long-cycle species, they play a leading role in the pollination of a diversity of agricultural crops such as oranges, tangerines, grapefruit, lemons, apples, watermelons, melons, coffee, tomatoes, kiwis, passion fruit, guavas, among many others, of which we would not be able to feed ourselves if it were not for the existence of the hard-working bees, apples, watermelons, melons, coffee, tomatoes, kiwis, passion fruit, guavas, among many others, which we could not feed ourselves if it were not for the existence of the hard-working bees or for the drastic reduction of their populations, which is already being felt in many countries of the planet. (THE CITIZEN, 2022).

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Permaculture and Beekeeping, origins and practices

In many documents collected throughout history, it is said that beekeeping is one of the oldest productive activities practiced in tropical areas of the earth (Contreras et al., 2018); in America the Mayan culture is the reference that has preserved the knowledge from generation to generation, acquiring socioeconomic relevance and becoming a source of income and employment of rural peasant ruralities, (Magaña et al., 2016). In addition that it is "a very broad scientific subject, which has to do with agriculture, nutrition, medicine, industrial products and environment." (Saha, 1999)It is also linked to the knowledge of peasant farmers in a rural territory, which they have been practicing empirically and is currently gaining importance, resuming its use, especially to enhance traditional agriculture with the pollination of short- and long-cycle crops (Macías et al., 2020).

> It is an agricultural activity that contributes to the protection of the environment and agroforestry production through the pollination action of bees" and as such beekeeping, as an agricultural activity, and from the point of view of organic, sustainable or good practice production, this has always meant a challenge, however for beekeeping, these words make sense considering the particular relationship that bees *(Apis mellifera)* maintain with the environment and in particular with plant species (Mancera and Sanchez, 2019).

One of its characteristics is its capacity to integrate with various ecosystems of life and development that use the same resources, such as: agriculture, forestry and nature conservation activities such as pollination of wild and cultivated plants, and maximization of harvests; due to the collection of nectar and pollen that bees perform, bringing great benefits to man (Velásquez and Goestchel, 2019). In addition to being a profitable activity for family farming economies, it is also friendly to endemic and native ecosystems, constituting "an ideal mechanism to strengthen agricultural ecosystems, endemic flora, surrounding vegetation, harmony between man and nature, since its practice returns to the beekeeper, the understanding and value for his natural environment" (Macías et al., 2022).

However, beekeeping worldwide is practiced in ecosystems deteriorated by the hand of man (Agüero et al., 2018), such as deforestation that causes the loss of the endemic flora of the area,

urbanization of agricultural land, logging of timber trees, indiscriminate pruning, fragmentation of species habitats, human displacement to areas with eco-systemic diversity such as native forests, hills and mountains, introduction of invasive species, among others (Verde, 2014)The loss of beehives due to pests and diseases, rain, frost, hurricane winds, intense heat due to climatic phenomena (Baena et al., 2022); the practice of agriculture of death that uses agrochemicals, exterminating the endemic flowering and with it the bees (Perone, 2011); and the use of agrochemicals, exterminating the endemic flowering and with it the bees (Perone, 2011). (Perone, 2011).

However, weighing all of the above, Permapiculture is what the bee has been doing for 50 million years and modern beekeeping is what man has been doing for only 150 years. Permapiculture is the "beekeeping of not doing", it simply gives the bees the necessary conditions to remember their instinct and information that they have latent, they cannot forget in 150 years what they have been remembering for 50 million years. This means that modern beekeeping is not natural, because when we intervene in the hives, we change everything that is happening inside, the bees must repair the environment and change the plans of the hive. In Permapiculture, the concept of beekeeper is changed to "honey harvester" (Perone, 2012 cited by Lopez, 2019).

Permapiculture is "the return to natural beekeeping, it is the return to what is reasonable, to what is sustainable, to what is in harmony with nature: harmonious, symbiotic, a virtuous circle, because that is what happens in the natural when man does not intervene, nature creates virtuous circles, circles of life in which everything has to do with everything, everything is symbiotic with everything, no part is more important than the whole, but the whole cannot be adequate without that part" (Perone, 2012 cited by Lopez, 2019).

Permapiculture is a beekeeping technique based on a deep respect for bees, and is born from the vocation of Oscar Perone, inspired by the Permaculture of the Australian Bill Mollison, as a philosophical daughter of Natural Agriculture or the "No-Making" of the Japanese Masanobu Fukuoka, which means a return to the natural, to the optimal production of food without polluting... (Perone, 2012b). (Perone, 2012b). It is an improved technique of what traditional beekeeping has conceived based on respect for the bees, it is "a return to the natural, to

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the optimal production of food without polluting, since the permapiculturist does not intervene in the hives, thus achieving a significant reduction in operating costs while experiencing considerable increases in production" (IICA, 2016, p. 8).

> Permapiculture according to the Perone method (natural extensive beekeeping) seeks to guide the work in order to achieve the environmental conditions, so that the bees can develop freely according to their own nature, building honeycombs not under a structure (frame) but rather respecting the way and form in which they elaborate in nature. At the same time using natural food (honey and pollen reserves) for feeding at the critical time of the year, in such a way that gastrointestinal diseases that man himself has developed in bees by using artificial feeding with sugar syrup will be reduced (Morales, 2014, p. 6).

It seeks the benefit of the beekeeper by concentrating on having good results in the number of hives as well as in their performance, achieving this by reducing the number of interventions in each hive, so that the beekeeper will be able to attend a greater number of units in the apiary. It respects the colony as an individual and gives back to it all the tasks that the bees perform alone, better than with the intervention of the beekeeper, giving them in abundance what they need to express their greatest potential, space, reserves and few or no revisions. (Perone, 2009).

Permaculture is not to do, to let the bees be bees again, not to intervene anything but to harvest... place them, populate them and leave them, they will not be touched until there is no honey for us. Bees in a natural hive and in a hollow like the one they need, like the one they can no longer find because we humans have taken away the immense trees where there were huge hollows where they took refuge and provided nature with their immense capacity to pollinate which is what they do (Perone, 2012).

The technique is limited to locate or assemble hives with standard materials that we already have and then place them in appropriate places to capture the swarm that will populate them free of charge and limit ourselves to collect the rent once or twice a year, the more times we have to collect it, the higher will be our profits and those of nature. Permaculture is a natural process and therefore of respect to the times and events of nature. (Perone, 2011).

Thus, its importance lies in the harmony that has always existed between plants, water, soil and human beings that are naturally interconnected with each other, in a sustainable way, which corresponds to the biological cycle of the natural ecosystem, of nature itself where they coexist; and considers four basic principles that are based on:

> 1) Provide adequate space for the bees, in the most suitable way by applying the golden ratio of the perfect number (1.61803);
>
> 2) Start with swarm captures in the areas where the apiaries will be established;
> 3) It is necessary that the bees carry out their work, as they have done ancestrally, provided the natural habitat, without much interference from man;
> 4) Harvesting honey, once there is enough, and leaving the necessary honey for the bees (IICA, 2016, p. 8).

The study by Morales (2014) refers to the work of Perone (2009) citing that in the permapiculture hive, the bees work in a natural way, the way they design their nests and accommodate their reserves for the winter season is respected and avoids the loss of strength of the colony that is common in our environment, caused by the constant revisions made by the beekeeper. One of the main advantages of the Perone hive model is that it uses the technique of permapiculture or natural extensive beekeeping in which the beekeeper does not intervene except to harvest the hives, thus substantially reducing the amount of inputs such as fuel, wax, labor and at the same time, it achieves as its main objective, the increase in the production of honey harvested per hive (Perone, 2009).

Another advantage of Permapiculture is that it is not necessary to have knowledge about the different techniques and management in beekeeping normally practiced in our environment (intensive beekeeping). Therefore, this study could validate this technology in our environment, adapting it to small and medium beekeepers who lack knowledge about the breeding and exploitation of bees or for people who want to enter the field of extensive beekeeping (Perone, 2009).

Permapiculture, the renovation

Beekeeping is renewed by the concept of Permapiculture, which goes far beyond a new terminology, this has been developed since millenary times, and it has been, thanks to the ancestral knowledge of those who

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have preceded in life, that its practice is currently being resumed. Thus, the expert in Permapiculture, Oscar Perone, of Argentine nationality, is one of the main exponents, defender and promoter of Permapiculture, not only as a means of economic production, which after all is the product of the exercise of a productive activity and is given by logical consequence; but by the principle of love, respect and conservation that man must provide to their environment and nature itself.

In this way, permaculture is an integrating principle of the laboriousness of the winged honey bees, of their organized way of working, of producing, of reproducing, of maintaining order, asepsis and food inside the hive, for all the bee population, the queen, the drones, the workers, in strict respect and consideration, since they are the ones who are teaching man, the beekeeper, the farmer, how things should be done, both in their time and in their space. This mission of the bees is the one that the promoted api permaculturist or permapiculturist begins to accept, to assimilate it and consequently to put it into action, to realize, finally, that the intrinsic values to the harmonic coexistence of the species are the foundation or the cornerstone on which rests the own life in mother nature.

> With permapiculture, beekeeping ceases to be what it has been and becomes a mere real estate operation. We are only the owners of the spaces where they live and they happily offer us huge profits for the corresponding rents, that's all, it's simple. There is no need to know anything about beekeeping... There is no need to apply beekeeping in hives that are only opened for harvesting, it is another way of saying, to collect the rent... By seeking the benefit of the beekeeper, concentrating on having more results in the number of hives than in the amount that each one yields, this is achieved by reducing the interventions in each hive, in this way the beekeeper can attend a greater number of units, consequently, he will not only win by producing more but also by spending less. (Perone, 2012a).

According to the latest scientific studies that show that there is no printed wax that is not contaminated, and that this contamination not only leaves residues in the products of the beehive, but, more seriously, together with the use of any drug, even those considered "innocuous" as the organic ones, obstruct the micro fauna inside the hives, preventing, among other things, the bees to properly carry out the process of ensilage of pollen, to make bee bread with the consequent

very serious results that are noticed everywhere. So, as a principle of self-defense, and, practical convenience for the economy of the beekeeper and his bees, the use of stamped wax is completely discouraged, replacing it systematically, filling the grooves of the heads of the frames, through which pure beeswax will be poured, from the one collected in previous harvests (Perone, 2012).

Permaculture, balance for ecosystems and bees

> When beekeepers harvest every last gram of honey, do not respect and intrude into the body of the hive animal and introduce their contaminated tools and hands, breaking the sacred seal of propolis with which the species defends itself from diseases, they are attacking and ending the work and life of the bees, that is why Permapiculture is so important, because by offering what the hive animal needs: immense size and peace, which is achieved with the non-intervention of the human being, it offers the hive animal the conditions it needs to achieve properly do its great work, and leaving us the owners of the boxes they inhabit by the functional rooms that we offer them in exchange for their invaluable services and wonderful products. (Perone, 2016).

In Oscar Perone's vast experience of more than forty years as a permapiculturist, practicing, teaching and taking the knowledge of Permapiculture through various territories of Latin America, they have corroborated that "the bad practices exercised for years by those who have worked traditional beekeeping are the real reason why beekeeper bees are at this moment in frank disappearance all over the planet." (Perone, 2016)This situation is aggravated by the increasingly polluted environments where bees are intended to work.

In contrast to these practices that have led to the global phenomenon of *Colony Collapse Disorder* (disappearance of entire hives), Permaculture takes care of the bees, offering the beekeeper the possibility, in some cases, to increase honey production up to four times, through "automatic hives", the beekeeper does not intervene at all in the production, thus achieving, in addition, a significant reduction in operating costs along with significant increases in harvest. (Perone, 2016).

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The development of the first Perone hive for Permapiculture considered the *standard* material of the Langstroth hive used in beekeeping, however, trying to adapt the hives carried with other systems to Permapiculture, is not the most appropriate, because even in the best cases, none reaches the results offered by the Perone hive, of very low cost of construction and that provides spectacular results if the conditions where it is placed are suitable for the bees to demonstrate their true power, unknown until then, now potential. (Perone, 2012).

Therefore, to implement permapiculture, very little capital is needed, and very little work, since it is only necessary to manufacture hives with low-cost materials, which will be placed in suitable sites, and with populations that when they reach adulthood, will provide harvests year after year, if weather conditions permit, with the only activity of the permapiculturists being harvesting, all details that make up this new method, together with the special suit of the beekeeper, designed to totally prevent the bees from reaching the body of the person wearing it, and to prevent the bees from dying, knowing how to "live together with them, in an absolutely sustainable way and in harmony with nature" (Perone, 2012b). (Perone, 2012b).

Perone (2011) considers, like many other beekeepers and scientists, that what inhabits the hollow of a tree or a beehive is a so-called social individual. This individual is formed by cells that fly (the bees) to bring from outside what the hive animal needs to subsist; also, more than one intensive beekeeper has been heard to express 'this season I did badly, what happened is that I could not attend them, I could not go to the apiary as many times as they need. And they don't need us at all! The result of intensive versus natural extensive farming is that the apparent advantage offered by intensive farming has been lost, of achieving more results being on top of each hive (not for nothing are bees in danger of disappearing) and natural extensive Permapiculture achieves results in each of the hives, not dreamed of by the intensive farming. (Perone, 2012a).

Therefore, Permapiculture respects the hive animal as an individual and gives back to it all the tasks that the bees perform alone better than with the intervention of the beekeeper, giving it in abundance what it needs to express its greatest potential: space, reserves and peace. Following the teachings of nature, he selects for the strongest, avoiding the economic cost of curing diseases, thus completely eliminating the risk of introducing impurities into the products. (Perone, 2012a).

Thus, the development of Permapiculture is based on the intimate conviction, widely proven by the experience achieved with the hives themselves, that what should be offered to the bees is only: space, reserves and peace, in this way more and more hives that produce with the lowest cost will be obtained. (Perone, 2011)But above all, it contributes to the preservation of such a precious species, like parents who keep, care for and save their daughters, like princesses who have their own wings, and in each flight, as they move from flower to flower, they give more life to life and transform the nectar into the food of life in a perfect communion.

Conclusions

Life itself embodied in man, animals, plants, mother nature, the planet and the universe all function in the harmony of the perfect triads conceived by the Creator, one of its reflections being the laborious, organized and productive work of the winged brides "the bees", composed of workers, drones and the queen, which form the ideal pyramidal base on which life, food and health of their own and others in their home community called the hive is based.

In this sense, respect for bees, their work and their food is to respect, value and also ensure food for humans, flora and fauna surrounding agricultural ecosystems, knowing that without bees there is no pollination, without pollination there is no flowering, without flowering there can be no fruit and without fruit there will be no food. This link leads to the assurance and permanence of all life on earth, without exceptions, although it seems not to be, and it is where man must play his role as custodian of the treasure of nature that requires a balance for the coexistence of species.

It is time for the traditional beekeeping man to renew himself, to be clothed with a love inspired by the life embodied in the brides of the sun, the winged honey makers, the winged pharmacists who drink the nectar from the source provided by God to ensure the existence of the planet, to transport it within themselves as the true guardians until it reaches the safe home of their hive and to transform it into the nutritional sustenance of their entire home-community-hive; but also as the humble and faithful servants that they are, they share it with those who have been stalking them, bursting in and tearing them away from

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their safe place of what by nature was conferred to them: their resistance, their strength and their immunity, to benefit from them and from what they do with the justified slogan of "raising them" as if they were domesticated mammals that go out to graze to be milked.

Such a mistake has cost and continues to cost the lives of millions of bees around the world, scourged by diseases and pests in their artificial habitats, which have come from intensive beekeeping overcrowded with unnecessary elements for them, and hand in hand with agricultural practices that have abused the use of agrochemicals in plantations, sweeping away the existence of so many beneficial insects, among them, the bees; However, hope is the key and it joins the ancestral knowledge and the good will of the male guardians who have generated enough conscience to amend the past mistakes, and that hope has a name "Permapiculture", and it only requires the decision, love and perseverance of a man renowned as Permapiculturist to return to nature its golden princesses.

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