



The Abril family opening a stingless bee nest for honey collection. (Natalia Roa)

Sustainable traditional native bee (*Melipona favosa*) keeping (哥伦比亚)

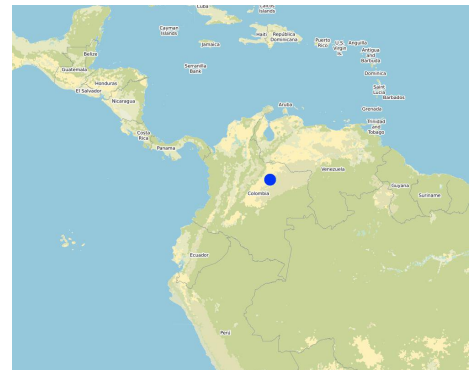
Cría de abeja mancita

描述

Native stingless bee keeping (*Melipona favosa*) protects bees and plants found in forest and savannah ecosystems to produce honey. In contrast to current destructive wild bee honey harvesting, members of the Abril family keep the traditional practice of capturing/rescuing wild nests, and adapt them so that honey can be extracted from the same nest for many years (up to 30 y) without killing the bees.

Native bee honey production in the floodable savannahs of the eastern Colombian Llanos (Orinoco River Basin), relies on stingless bees of the species *Melipona favosa*. These bees nest inside tree trunks. The main characteristics of the native bee keeping, as currently performed by three generations of the Abril Family, is that it is sustainable, promotes de conservation of native ecosystems, and as far as we know, constitutes the only sustainable and profitable direct use of local biodiversity in the floodable savannahs of the eastern Llanos in Colombia. Its sustainability is due to the adaptations and management of the nests, so that honey can be extracted without damaging the bees. On one hand, they know how to retrieve wild nests, either by rescuing them from rotten trees or the ground, or by cutting the branch with the nest, and then keeping its natural position at all times. Once at their houses, they will study the outside of the nest and listen to the bees inside the nest, with this information they will cut out a part of the tree trunk to create a window. Once opened, they verify the location of the honey and pollen pots and the broods. Then, they will reattach the cut part on to the trunk by using metal wire and sealing the edges with mud. The nest will be hung with wire in the position it was originally found. Once on site they will check every day for the presence of the sentinel bee and bee activity. Furthermore, they only extract honey during the end of the dry season when bees have enough food reserves. For the extraction, they will reopen the previously cut window, and extract the honey and pollen pots, making sure enough are left behind so that bees can have access to food as well. The mean honey production from each nest is around the 750 ml- 1000 ml. Honey is kept for their own use and sold to some people for a fairly high price (30 dollars per 750 ml). The honey is mainly consumed as a medicinal product, and its low quantity makes it highly sought after. If someone requests it for sight issues, Héctor will extract the honey with a syringe so that it is as clear as possible. The native bee keeping contributes to protect native bees, as the management of nests can keep them functional for up to 30 years. The Abril family members are well aware of the dependency between honey production and presence of native plants from where bees forage for nectar and pollen. Therefore, they avoid forest clearing and selectively keep shrubs in the grasslands to guarantee food supply for their bees. Also, they plant fruit trees such as guayaba (*Psidium guajava*) and arazá (*Eugenia stipitata*), that benefit the bees, which at the same time benefit pollination. Fruit production is mainly used for home use and very seldom they are sold. They also witness the negative impacts that agrochemical airborne dispersion from rice production in the neighbouring farms, have on wild bee populations. So far, their main concern is that they do not know how to multiply the nests.

地点



地点: Municipality: Trinidad, Vereda: Los Chochos, Casanare, 哥伦比亚

分析的技术场所数量: 2-10个场所

选定地点的地理参考

- -71.46278, 5.43194
- -71.45306, 5.43472
- -71.45639, 5.42639
- -71.46234, 5.44203
- -71.46903, 5.43549

技术传播: 适用于特定场所/集中在较小区域

在永久保护区?: 否

实施日期: 10-50年前

介绍类型

- 通过土地使用者的创新
- 作为传统系统的一部分 (> 50 年)
- 在实验/研究期间
- 通过项目/外部干预



Boncieth Abril Listening to the bees to know how the nest is organized inside the tree trunk prior to honey collection (Natalia Roa)



Cleaning the mud off from the window before opening it so that it does not fall on the honey pots (Natalia Roa)

技术分类

主要目的

- 改良生产
- 减少、预防、恢复土地退化
- 保护生态系统
- 结合其他技术保护流域/下游区域
- 保持/提高生物多样性
- 降低灾害风险
- 适应气候变化/极端天气及其影响
- 减缓气候变化及其影响
- 创造有益的经济影响
- 创造有益的社会影响

土地利用

同一土地单元内混合使用的土地：否



牧场

- 经营牧场

动物类型: 牛 - 非奶牛牛肉

是否实行作物与牲畜的综合管理?: 否

产品和服务: 肉类

品种	计数
牛 - 非奶牛牛肉	150
beekeeping, apiculture	80



森林/林地

- (半天然) 天然森林/林地: 热带潮湿落叶林天然植被, 热带灌木地天然植被, Natural strips of gallery forest along savannah's rivers. 管理: 选伐, 非木材森林的利用

供水

- 雨养
- 混合雨水灌溉
- 充分灌溉

土地退化相关的目的

- 防止土地退化
- 减少土地退化
- 修复/恢复严重退化的土地
- 适应土地退化
- 不适用

解决的退化问题



土壤水蚀 - Wt : 表土流失/地表侵蚀



土壤风蚀 - Et : 表土流失



物理性土壤退化 - Pc : 压实



生物性退化 - Bh : 栖息地丧失, Bs : 质量和物种组成/多样性的下降

SLM组

- 养蜂、养殖业、家禽业、养兔业、养蚕业等

SLM措施



植物措施 - V1 : 乔木和灌木覆盖层



管理措施 - M1 : 改变土地使用类型

技术图纸

技术规范

This is too complex to draw, so we presented the sequence of extracting honey in a nest that has been modified so that the nest can live up to 30 years.



This is the housing for the nests. These nests have been collected or rescued from field. The youngest has 3 years the oldest has around 30 years. It is very important to keep the nests in the position they were originally found. The housing is to prevent direct sunshine and rainfall exposition.



Author: Natalia Roa y Beatriz Ramírez

Author: Natalia Roa

技术建立与维护：活动、投入和费用

投入和成本的计算

- 计算的成本为：每个技术单元 (单位：bee nest)
- 成本计算使用的货币：美元
- 汇率 (换算为美元)：1 美元 = 不适用
- 雇用劳工的每日平均工资成本：\$ 15

影响成本的最重要因素

The way they manage the bee productive system is fairly cheap and most materials are already accessible within the farms.

技术建立活动

1. Wild nest rescue or extraction and transport to the house (时间/频率: Depends on the finding, but it is preferred in the dry season where more floral resources are available)
2. Opening of a window in the nest (时间/频率: A couple of days after being collected/rescued)
3. Locating the nest under housing (时间/频率: Just after the window opening)

技术建立的投入和成本 (per bee nest)

对投入进行具体说明	单位	数量	单位成本 (美元)	每项投入的总成本 (美元)	土地使用者承担的成本%
劳动力					
Two people for wild nest rescue or extraction and transport to the house	day	2.0	15.0	30.0	100.0
Opening of a window in the nest	day	0.5	15.0	7.5	100.0
Housing construction (two people)	day	2.0	15.0	30.0	100.0
					100.0
设备					
Saw	unit	1.0	20.0	20.0	100.0
Chissel	unit	1.0	10.0	10.0	100.0
hammer	unit	1.0	8.0	8.0	100.0
Metal wire	kilo	0.5	11.0	5.5	100.0
Ax	unit	1.0	20.0	20.0	100.0
施工材料					
boles minimum 15 cm diamater and 2 m of height	boles	4.0	8.0	32.0	100.0

wood support 4 m long	unit	4.0	6.0	24.0	100.0
Roof laminas (3 m)	laminas	3.0	18.0	54.0	100.0
Nails	box	2.0	9.0	18.0	100.0
技术建立所需总成本				259.0	
技术建立总成本, 美元				259.0	

技术维护活动

1. Checking the bee nests (时间/频率: daily)
2. Harvesting honey (时间/频率: yearly)
3. Seedling collection (时间/频率: monthly)
4. tree nursery care (时间/频率: daily)
5. planting trees (时间/频率: monthly)

技术维护的投入和成本 (per bee nest)

对投入进行具体说明	单位	数量	单位成本 (美元)	每项投入的总成本 (美元)	土地使用者承担的成本%
劳动力					
Daily check per bee nest	day	0.005	15.0	0.07	100.0
honey harvest per bee nest (2 people)	day	1.0	15.0	15.0	100.0
Seedling collection	month	2.0	15.0	30.0	100.0
Planting of fruiting trees	month	2.0	15.0	30.0	100.0
设备					
Chissel	unit	1.0	10.0	10.0	100.0
Broom	unit	1.0	3.0	3.0	100.0
Hammer	unit	1.0	8.0	8.0	100.0
Syringe	unit	1.0	0.2	0.2	100.0
Empty glass bottles (750 ml)	unit	70.0	0.4	28.0	100.0
Table	unit	1.0	30.0	30.0	100.0
shovel	unit	1.0	20.0	20.0	100.0
植物材料					
Bags x 50 units	bag	1.0	5.0	5.0	100.0
Soil	sack	4.0	6.0	24.0	100.0
技术维护所需总成本				203.27	
技术维护总成本, 美元				203.27	

自然环境

年平均降雨量

- < 250毫米
- 251-500毫米
- 501-750毫米
- 751-1,000毫米
- 1,001-1,500毫米
- 1,501-2,000毫米
- 2,001-3,000毫米
- 3,001-4,000毫米
- > 4,000毫米

农业气候带

- 潮湿的
- 半湿润
- 半干旱
- 干旱

关于气候的规范

以毫米为单位计算的年平均降雨量: 1938.0
 highly monomodal seasonal rainfall with 4 months without rainfall (< 60 mm/ month), and 8 months with rainfall (>100 mm/ month) with June as the month with highest rainfall (> 300 mm)
 气象站名称: Estación pluviométrica de Trinidad (IDEAM)
 The highly seasonal rainfall, implies four months of extreme drought and at least 6 months of flooded areas. Both severely limit crop growth.

斜坡

- 水平 (0-2%)
- 缓降 (3-5%)
- 平缓 (6-10%)
- 滚坡 (11-15%)
- 崎岖 (16-30%)
- 陡峭 (31-60%)
- 非常陡峭 (>60%)

地形

- 高原/平原
- 山脊
- 山坡
- 山地斜坡
- 麓坡
- 谷底

海拔

- 0-100 m a.s.l.
- 101-500 m a.s.l.
- 501-1,000 m a.s.l.
- 1,001-1,500 m a.s.l.
- 1,501-2,000 m a.s.l.
- 2,001-2,500 m a.s.l.
- 2,501-3,000 m a.s.l.
- 3,001-4,000 m a.s.l.
- > 4,000 m a.s.l.

.....应用的技术

- 凸形情况
- 凹陷情况
- 不相关

土壤深度

- 非常浅 (0-20厘米)
- 浅 (21-50厘米)
- 中等深度 (51-80厘米)
- 深 (81-120厘米)
- 非常深 (> 120厘米)

土壤质地 (表土)

- 粗粒/轻 (砂质)
- 中粒 (壤土、粉土)
- 细粒/重质 (粘土)

土壤质地 (地表以下>20厘米)

- 粗粒/轻 (砂质)
- 中粒 (壤土、粉土)
- 细粒/重质 (粘土)

表土有机质含量

- 高 (>3%)
- 中 (1-3%)
- 低 (<1%)

地下水水位

- 表面上
- < 5米
- 5-50米
- > 50米

地表水的可用性

- 过量
- 好
- 中等
- 匮乏/没有

水质 (未处理)

- 良好饮用水
 - 不良饮用水 (需要处理)
 - 仅供农业使用 (灌溉)
 - 不可用
- 水质请参考:

盐度是个问题吗?

- 是
- 否

洪水发生

- 是

物种多样性

- 高
- 中等
- 低

栖息地多样性

- 高
- 中等
- 低

应用该技术的土地使用者的特征

市场定位

- 生计 (自给)
- 混合 (生计/商业)
- 商业/市场

非农收入

- 低于全部收入的10%
- 收入的10-50%
- > 收入的50%

相对财富水平

- 非常贫瘠
- 贫瘠
- 平均水平
- 丰富
- 非常丰富

机械化水平

- 手工作业
- 畜力牵引
- 机械化/电动

定栖或游牧

- 定栖的
- 半游牧的
- 游牧的

个人或集体

- 个人/家庭
- 团体/社区
- 合作社
- 员工 (公司、政府)

性别

- 女人
- 男人

年龄

- 儿童
- 青年人
- 中年人
- 老年人

每户使用面积

- < 0.5 公顷
- 0.5-1 公顷
- 1-2 公顷
- 2-5公顷
- 5-15公顷
- 15-50公顷
- 50-100公顷
- 100-500公顷
- 500-1,000公顷
- 1,000-10,000公顷
- > 10,000公顷

规模

- 小规模
- 中等规模的
- 大规模的

土地所有权

- 州
- 公司
- 社区/村庄
- 团体
- 个人, 未命名
- 个人, 有命名

土地使用权

- 自由进入 (无组织)
- 社区 (有组织)
- 租赁
- 个人

用水权

- 自由进入 (无组织)
- 社区 (有组织)
- 租赁
- 个人

进入服务和基础设施的通道

- 健康
- 教育
- 技术援助
- 就业 (例如非农)
- 市场
- 能源
- 道路和交通
- 饮用水和卫生设施
- 金融服务



注释

These farms are in fairly remote area with poor access roads, there is a rural school but for the other services people have to travel for at least 2 hours by car to the closest urban center.

影响

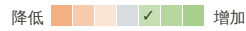
社会经济影响

非木材林业生产



Honey harvesting from collected bee nests

农业收入



Honey harvesting contributes with about 10% of farm income

收入来源的多样性



Honey harvesting is an additional income source from cattle ranching

社会文化影响

食品安全/自给自足



Part of the honey and most of the fruits harvested are consumed by the land user themselves.

生态影响

有益物种 (捕食者、蚯蚓、传粉者)



The preservation of bee nests increases pollinator presence, whilst the conservation of gallery forests preserves habitats for wild bee populations.

栖息地多样性



allowing for fallows to regenerate for providing bees with resources (nectar, pollen, resins and seeds) increase habitat diversity.

场外影响

缓冲/过滤能力 (按土壤、植被、湿地划分)

减少 改良

Riparian forest conservation contributed to water regulation

成本效益分析

与技术建立成本相比的效益

短期回报

非常消极 非常积极

长期回报

非常消极 非常积极

与技术维护成本相比的效益

短期回报

非常消极 非常积极

长期回报

非常消极 非常积极

Honey harvesting is only possible once per year so for the short term it takes some time before retrieving income. However, once the nests are re-established at home the maintenance is fairly easy. The rareness and uniqueness of the product sells well in the local market. The external markets are not aware of such a product.

气候变化

气候有关的极端情况 (灾害)

流行病

非常不好 非常好

采用和适应

采用该技术的地区内土地使用者的百分比

单例/实验

1-10%

11-50%

> 50%

在所有采用这种技术的人当中，有多少人在没有获得物质奖励的情况下采用了这种技术？

0-10%

11-50%

51-90%

91-100%

户数和/或覆盖面积

5

最近是否对该技术进行了修改以适应不断变化的条件？

是

否

什么样的变化条件？

气候变化/极端气候

不断变化的市场

劳动力可用性 (例如，由于迁移)

结论和吸取的教训

长处: 土地使用者的观点

- The medicinal properties attributed to the product make it highly sought after.
- Having the nests at home, and passing on the traditional practice to new generations is very important, because they find very interesting to know about bee behaviour and pollination function for fruiting trees.
- Costs are fairly low, and despite production is synchronized the demand of the product is higher than the production, so it is a welcome income to the family household assets.

长处: 编制者或其他关键资源人员的观点

- Their practice is non destructive and bee population is enhanced in the houses, it is very likely that bees will find new wild nesting sites. In this regard bee nests at houses are a source of individuals for wild populations, given that there are trees and forests nearby.
- This practice and their knowledge on bee behaviour and biology motivates people to conserve forests and trees and allow for fallows surrounding their houses.
- Negative effects on their bee populations derived from land use change in their surroundings and application of agrochemicals by neighboring rice crops serve as an indicator for them to know if those practices are deteriorating their environment.

弱点/缺点/风险: 土地使用者的观点如何克服

- Despite the long term survival of captured wild bee nests, they still rely on collecting wild nests. Which in time they feel are more scarce. For them it is crucial to learn how to split their "domesticated" nests so they can increase production without depending on wild nests.
- The expansion of rice crops in the area is a major threat. Public policy and law enforcement in aerial agrochemical application is urgent. Also, the transition from usual rice crop management to a more environmental management is required.
- New generations are less likely to adopt traditional practices, endangering the persistence of this knowledge in time. The recognition of this traditional productive system is fundamental.

弱点/缺点/风险: 编制者或其他关键资源人员的观点如何克服

- A one time per year harvesting of the product could potentially be increased to expand this sustainable practice. Restoration of key dietary elements surrounding their houses and an increase in connectivity with remaining forest patches could potentially increase honey production.
- We agree that the loss of this practice is imminent if it is not protected as a cultural heritage. Knowledge transfer to new generations and the recovery of this productive system, once "domesticated" bee nest can be divided or multiplied.

编制者

Beatriz Ramirez

Editors

Luisa F. Vega

审查者

Hanspeter Liniger

实施日期: June 24, 2020

上次更新: June 27, 2021

资源人

Héctor Abril - 土地使用者

Héctor Frugo Abril - 土地使用者

Damaris Abril - 土地使用者

Boncieth Abril - 土地使用者

Héctor Daniel Abril - 土地使用者

WOCAT数据库中的完整描述

https://qcat.wocat.net/zh/wocat/technologies/view/technologies_5797/

链接的SLM数据

不适用

文件编制者

机构

- Centro de Estudios Ambientales de la Orinoquia- Asociación de Becarios de Casanare (ABC) - 哥伦比亚

项目

- Onsite and Offsite Benefits of SLM

链接到网络上可用的相关信息

- Diversidad de abejas sin aguijón (Hymenoptera: Meliponini) utilizadas en meliponicultura en Colombia. Nates-Parra, G. and Rosso-Londoño, J.M. (2013).: <https://www.redalyc.org/pdf/3190/319029232001.pdf>
- Policy Brief: Land Use Change Impacts in the Cusiana Watershed of the River Basin, Orinoco River Basin, Colombia Author: Liniger HP, Vega LF, Ramírez BH, Eichenberger J, Year: 2020: <https://www.wocat.net/en/projects-and-countries/projects/onsite-and-offsite-benefits-sustainable-land-management/colombia>
- Video: Land Use Change Impacts in the Cusiana Watershed of the River Basin, Orinoco River Basin, Colombia: <https://vimeo.com/429999595>

This work is licensed under [Creative Commons Attribution-NonCommercial-ShareAlike 4.0 International](https://creativecommons.org/licenses/by-nc-sa/4.0/)

