

# Farming with Alternative Pollinators (FAP) in semi-arid regions



Stefanie Christmann, Pierre Rasmont, Youssef  
Bencharki, Moulay Chrif Smaili & the FAP team



In semi-arid regions large monocultures of cereals dominate the landscape. Olive orchards are also increasingly planted, flowering weeds are scarce. Cereals and olives do not require insect pollinators. However, increasing droughts and frequent heat waves and droughts might induce farmers in future to produce more pollinator-dependent high-income crops like fruits, vegetables, spices or oil seeds.

This will be possible only, if the current generation of farmers protects pollinators e.g., by diversification of crops or diverse FAP-fields.

**Enhance the diversity of crops and  
attract more pollinators to your fields!**



**FAP-planting schemes**



# Protect these effective wild pollinators



**Bumblebees** pollinate effectively faba bean, vegetables and fruits. They are social bees. The queens remain sleeping in ground holes during the summer. In autumn, they initiate new colonies in abandoned burrows of mice. Protect the queens and their nesting areas to benefit from good pollination service.



# Protect these effective wild pollinators



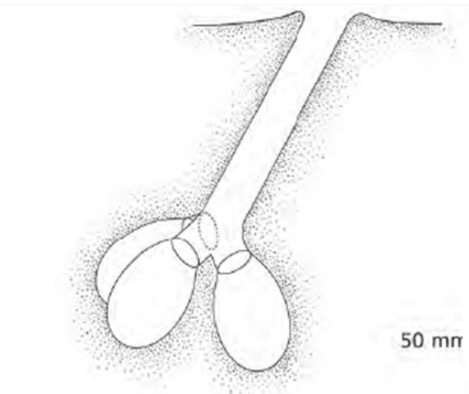
Large carpenter bees pollinate effectively eggplant, cucurbits and vegetables. They are solitary cavity nesters bees. The adults overwinter individually, often in previously constructed brood tunnels in dead wood. Protect and provide nesting materials (e.g., dead wood, drilled holes into wood, or even plastic tubes ...) to benefit from good pollination service.



# Protect these effective wild pollinators



**Flower-bees** pollinate effectively faba bean and other legumes. They are solitary ground nesting bees that establish their deep burrow in vertical embankments with mixed clay and sand. Create areas of bare banks and protect these bees from tillage to benefit from good pollination service.



# Protect these effective wild pollinators



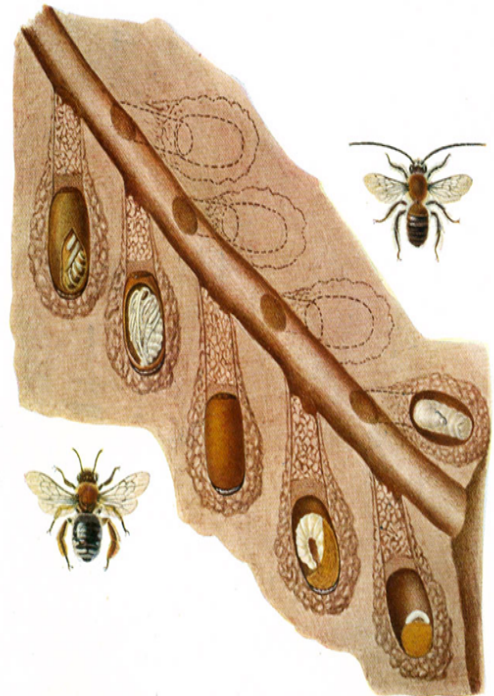
**Banded bees** are effective pollinators of cucurbits and vegetables. They are solitary bees that excavate nests in the soil sometimes on flat ground but more often in vertical clay banks. Create areas with bare embankments and protect the offspring from tillage and the harmful farming practices and chemical amendments to benefit from good pollination service.



# Protect these effective wild pollinators



Long-horned bees are effective pollinators of faba bean and arugula. They are long tongued, ground nesting solitary bees. They burrow vertical cells at the end of a rather long lateral gallery. Create patches of bare soil and protect the offspring from tillage, harmful farming practices and chemical amendments to benefit from good pollination service.



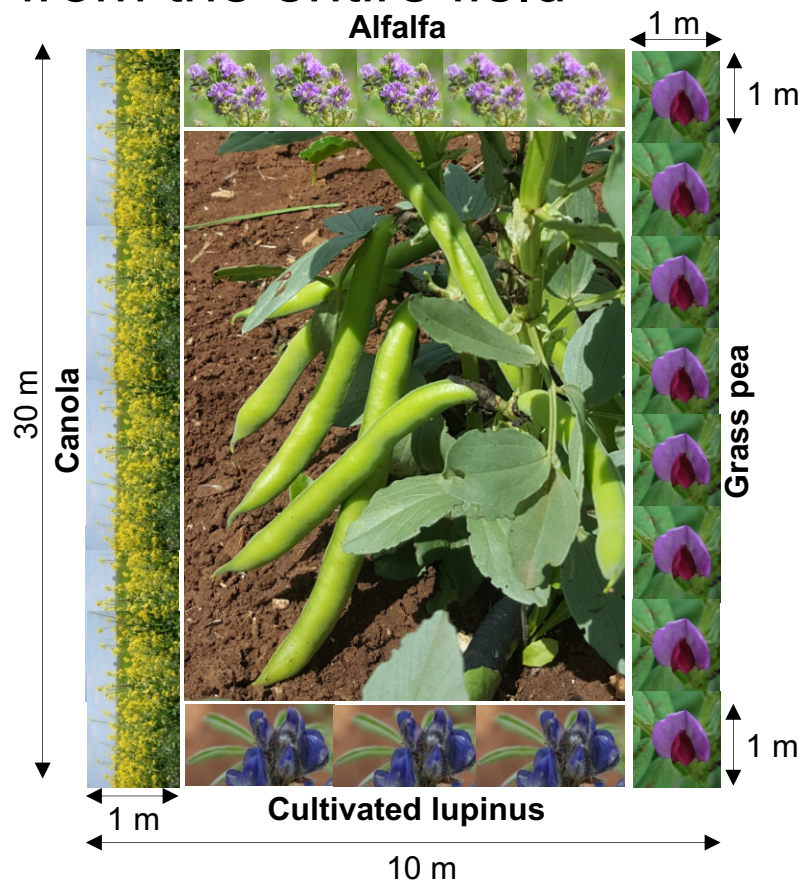
# Protect these effective wild pollinators



**Furrow bees** pollinate effectively cucurbits like melon, zucchini and pumpkin. They are solitary ground nesting bees that establish their nests in soils with mixed clay and sand. Create areas of bare grounds and protect these bees from tillage to benefit from good pollination service.



# Marketable habitat enhancement plants to enhance your faba bean production and have higher income from the entire field



**Main crop: Faba bean**

Best responding cultivar: Reina Mora

**Seeding times**

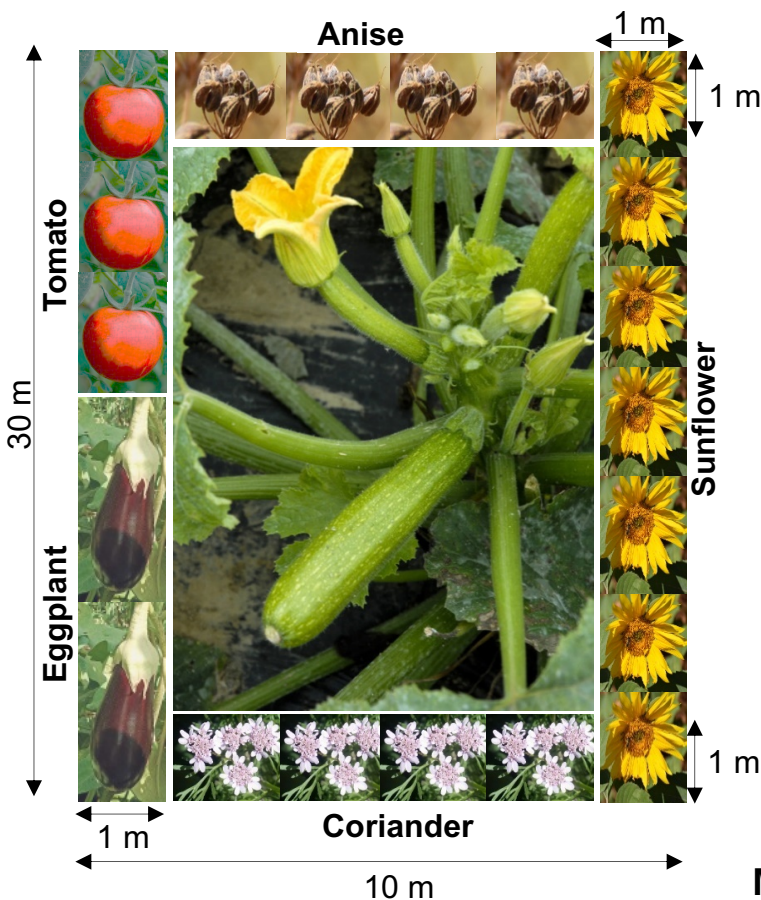
Late November:

Cultivated lupinus, Grass pea, Canola, Alfalfa

Late November:

Faba bean

Marketable habitat enhancement plants to enhance your zucchini production and have higher income from the entire field



**Main crop: Zucchini**

Best responding cultivar: Meyadah

**Planting times**

Late August:

Eggplant, Tomato,

**Seeding times**

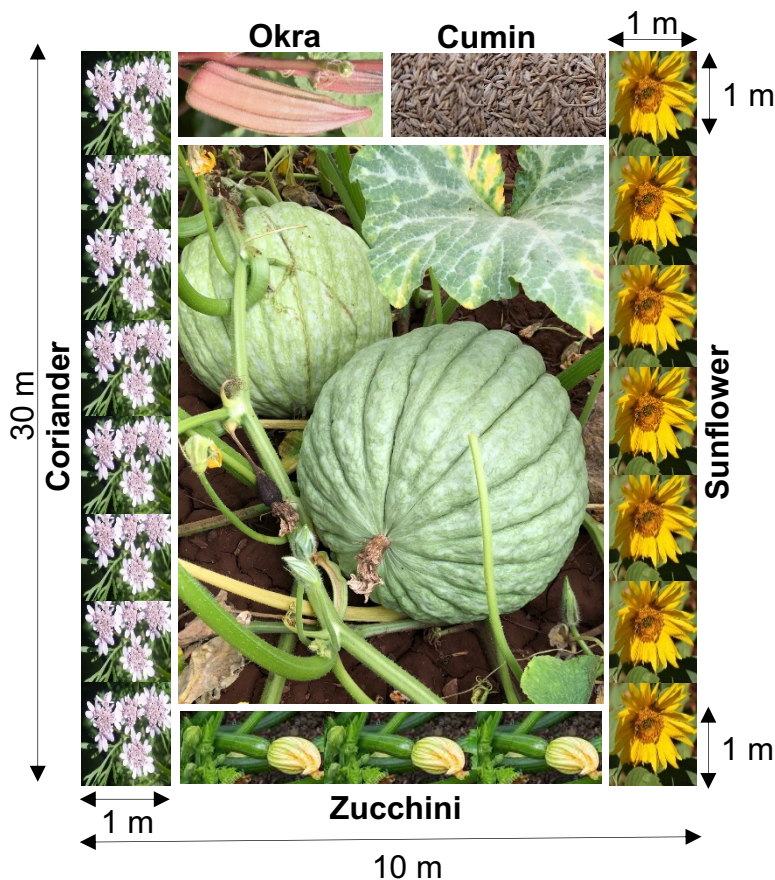
First August:

Anise, Sunflower, Coriander

Late August:

Zucchini

# Marketable habitat enhancement plants to enhance your pumpkin production and have higher income from the entire field



**Main crop: Pumpkin**

Best responding cultivar: Rtaylia (local variety)

**Seeding times**

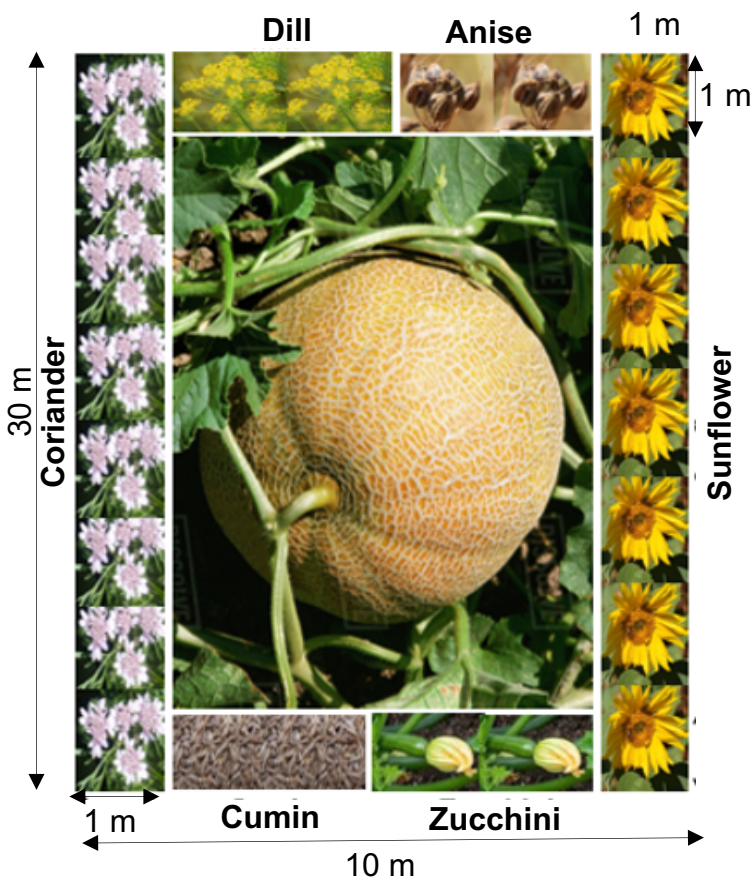
**Mid May:**

Coriander, Cumin, Okra, Sunflower, Zucchini

**First June:**

Pumpkin

Marketable habitat enhancement plants to enhance your melon production and have higher income from the entire field



**Main crop: Melon**

Best responding cultivar: Miami

**Seeding times**

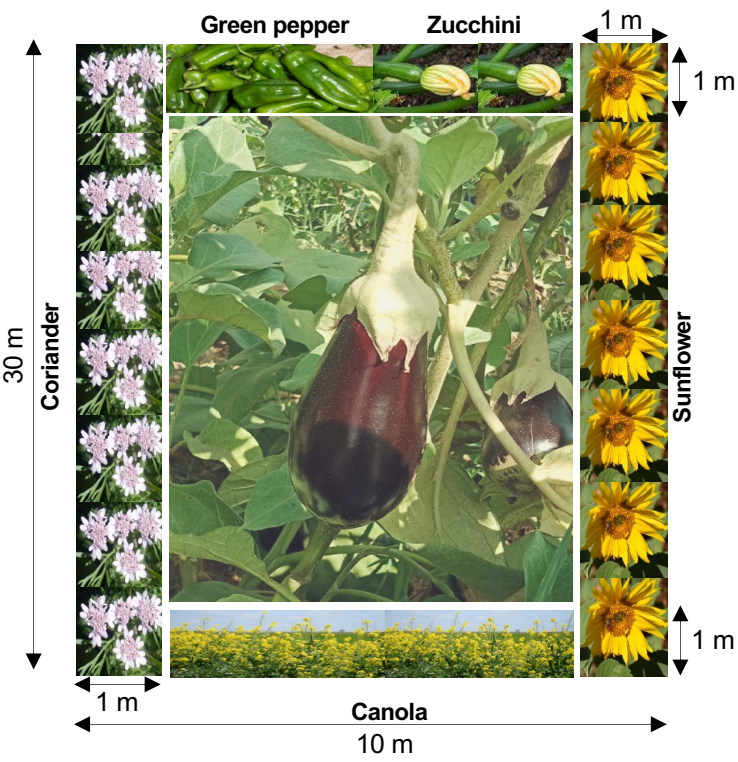
Early March:

Coriander, Dill, Anise, Sunflower, Zucchini, Cumin

Early May:

Melon

# Marketable habitat enhancement plants to enhance your eggplant production and have higher income from the entire field



**Main crop: Eggplant**  
Best responding cultivar: Vernal  
**Planting times**  
Mid May:  
Eggplant, Green Pepper  
**Seeding times**  
Early April:  
Canola, Sunflower, Coriander  
Mid May:  
Zucchini

In our trials with smallholder farmers in Settatt region, FAP farmers had on average 185% higher net income per field than control farmers planting only the main crop in the entire field. FAP-farmers had a higher number of fruits and often very good quality. Pest abundance was substantially reduced. The FAP impact was much higher than in the other three agro-ecosystems of the project, we assume, because the region is already degraded concerning the habitat requirements of pollinators.



# Use FAP planting designs and protect pollinators



**Copyright and Fair Use: ISSN 2709-7773-00121**

This document is licensed for use under the Creative Commons Attribution-ShareAlike (CC-BY-SA) 4.0 International License. To view this license, visit <http://creativecommons.org/licenses/by-sa/4.0/>.

Copyright ©2021 International Centre for Agricultural Research in the Dry Areas (ICARDA)  
All rights reserved. Photos: ICARDA  
International Center for Agricultural Research in the Dry Areas (ICARDA), PO Box  
114/5055, Beirut, Lebanon