

# Increase cucumber yield by protecting native pollinators

## Farming with Alternative Pollinators (FAP)



**ICARDA/INRA Field guide for farmers  
in high rainfall areas of Morocco**

**Dr. Stefanie Christmann  
Dr. Moulay Chrif Smaili  
Mr. Abdellah Benbya**

**Wild bees, flies, wasps, butterflies and other wild pollinators provide 85% of the pollination services,**



but in such landscape they don't find nectar and pollen to cover their needs during the whole year. They also do not have nesting material and sites, shelter against wind etc. Often, they are exposed to insecticides. Globally, more and more species go extinct and consequently farmers, nature and mankind lose their services.





**Strips and field edges with plants attracting a high diversity of pollinators and natural enemies can increase your yield and sustain pollinator diversity.**

Coriander attracts very high diversity of pollinators and natural enemies; sunflower attracts a high diversity of bees.



The FAP fields have higher diversity of pollinators than control fields:

FAP-fields on average **8-17 different pollinator species**

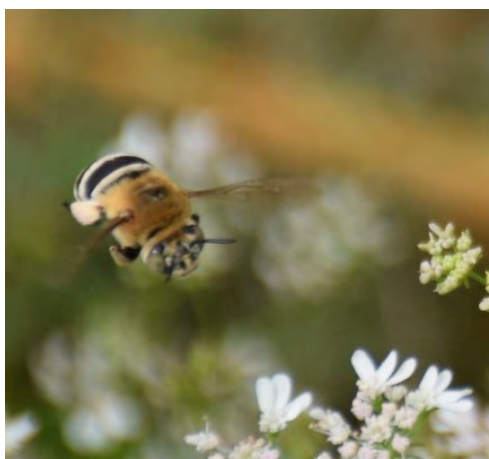
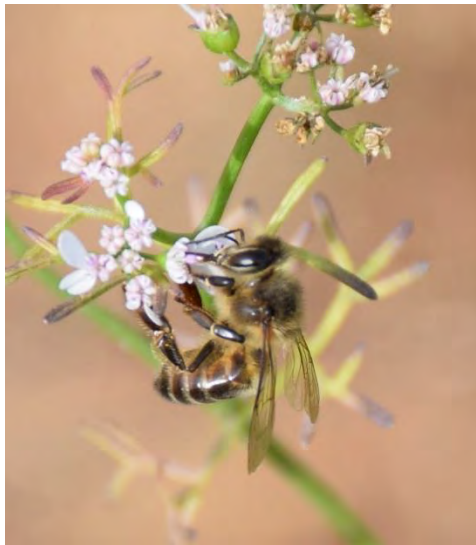
Control-fields on average **0-1 pollinator species** (usually honeybee).

Control fields having only cucumbers – like a monoculture. They attract less pollinators and natural enemies.

If you cannot avoid use of chemicals, apply them before sunrise or after sunset – when less beneficial insects are in the field.



**Higher crop variety helps you to attract many beneficial pollinators and also predators and parasitoids, which help to control cucumber pests.**



**The higher diversity of pollinators increases the quality and the quantity of cucumbers.**

**FAP field (enhanced pollinator diversity)**



Many flowers turn into a cucumber.



Cucumbers have long and even shape, are green all around and have good taste – and market price.

**Control field (only one crop)**



Less flowers produce cucumber fruits.

The cucumbers are often curved, partly yellow or with grey marks, uneven – and have low market price.





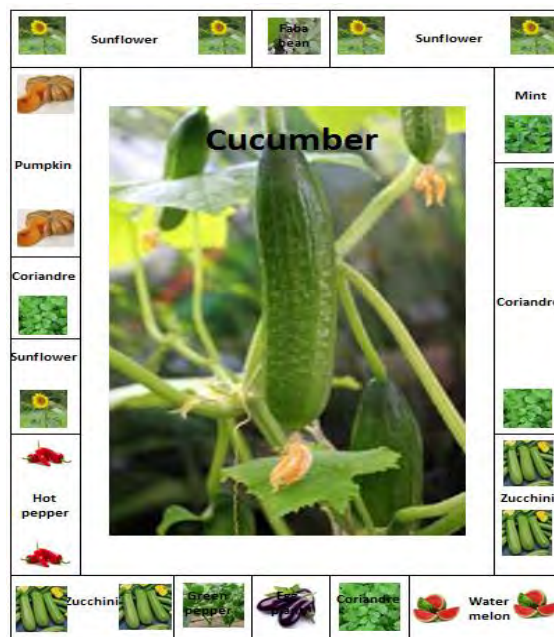
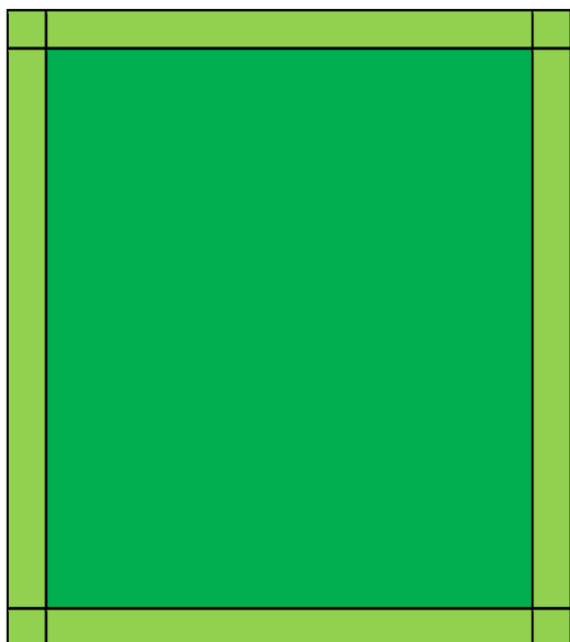
**Wild species need place and material close to or on your field to build a nest: a little clay wall, dead wood, or hard soil.**



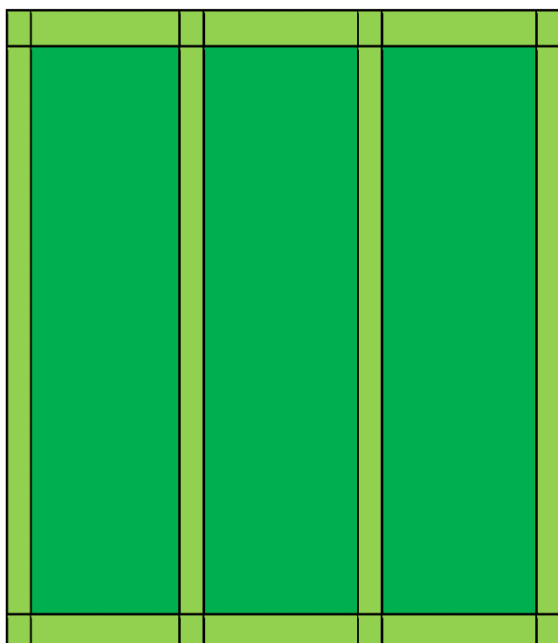
**They want to drink and benefit from shelter against wind (e.g. from sunflower, blackberry or currant)**



If you produce mainly for your family, we suggest this planting sketch for 0.03 ha (300m<sup>2</sup>)



If you have large fields and need to employ labor, we suggest strips every 10 m.



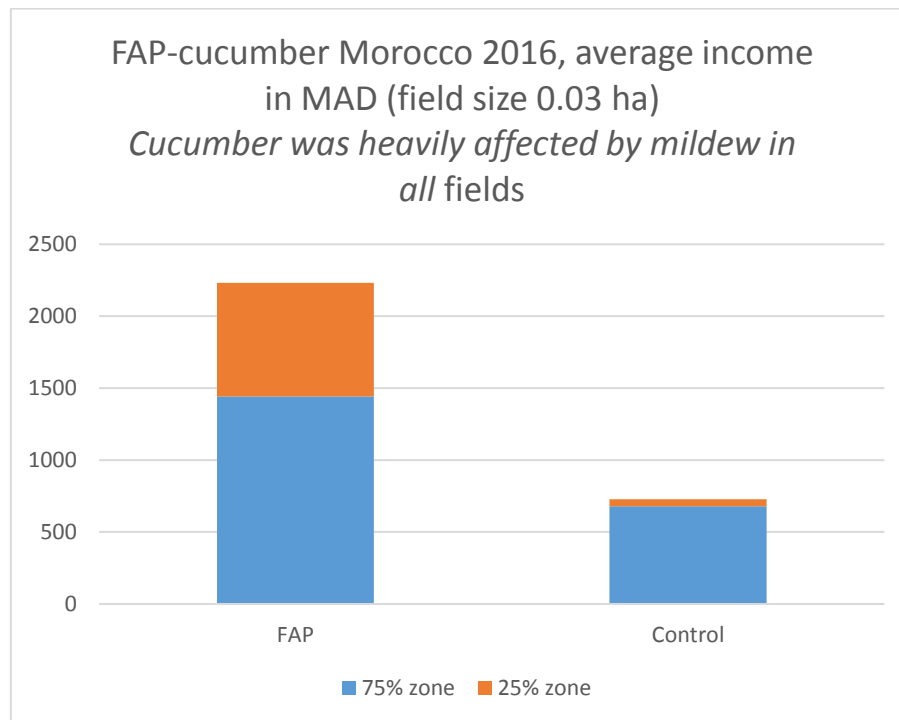
Within the strips seed alternating sunflower and coriander.

You can enhance the effect by seeding

- both on some of the strips 2 weeks earlier and
- on some parts of the strips 1 week after seeding cucumber.



The fields with more crops/better living conditions for wild pollinators provide higher income from cucumber (blue part of the columns) and also in total. The habitat zone can buffer against income loss in case the main crop is affected by disease or pests.



**Figure 1:** Comparison of income (Moroccan Dirham) from control- and FAP-sites (average).



Photos: Dr. Stefanie Christmann

**Other crops, which might benefit from FAP**

apple, peach, apricot, pear,  
 plum, cherry, avocado  
 raspberry, strawberry,  
 blueberry  
 black and red currant  
 almond, macadamia  
 watermelon, melon  
 pumpkin, zucchini  
 faba bean  
 eggplant, capsicum, tomato  
 buckwheat  
 mustard, canola, sunflower

**seeds of**

coriander, cumin, fennel  
 alfalfa



Copyright and Fair Use: ISBN: 92\_9127\_491\_7  
 This work is licensed under a Creative Commons Attribution 3.0 International License  
 Copyright ©2016 International Centre for Agricultural Research in the Dry Areas (ICARDA) All rights reserved.

International Center for Agricultural Research in the Dry Areas (ICARDA) , PO Box 114/5055, Beirut, Lebanon