Urban and peri-urban gardening promotes urban and soil biodiversity

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INTRODUCTION

Urban and peri-urban agriculture (UPA) provides a complementary strategy in order to reduce urban poverty and enhance urban environmental management. From an ecological perspective, urban and peri-urban agriculture presents many advantages and introduces new methods and strategies for sustainable production by providing effective solutions to the need to increase crop performance, food supply and to safeguard biodiversity.

The present communication intends to synthesize the benefits of UPA as a nature-based solution to improve urban and soil biodiversity, and food supply as demonstrated by the preliminary results of a research conducted by CREA.

METHODOLOGY

- 2012: CREA activated a demonstration urban garden
- It provides research activities and students' and operators' training
- 2017: recognized an educational-social site by the "National Rural Network"
- 2020: included in the "Regional Network of Social Agriculture".

- The garden hosts contemporarily several botanic families of vegetables in every season
- Vegetables are consociated with beneficial plants (garden self-defence capability)
- The garden is also based on soil self-fertility

- The aim is to create a superficial humogenic layer of soil
- The garden includes perimetral hedges consisting of perennial plants and fruit trees
- A pond ensures the presence of predatory amphibians and birds
- In the synergistic garden, tomato, roman lettuce, savoy cabbage, parsley, red beetroot and courgette were consociated (summer).
- In the organic garden, the same crops were planted in specialized rows
- Results of the two different farming systems were compared
- Stone walls accommodate insects and slime predators

The demonstration garden of CREA, an example of a biodiverse peri-urban garden, is managed with conservation techniques and is aimed at research activities and students'/operators' training.

Fig.1

Fig.2

RESULTS AND DISCUSSIONS

- ✓ Production: there is an increase in the synergistic garden compared to the organic one, between 10 and 30%.
- ✓ Ripening season: advance of about twenty days or delay of ten days were observed (widening of ripening/harvesting calendar).
- ✓ The choice to use the synergistic cultivation system in urban habitat can be a valid alternative in organic farms.
- ✓ The synergistic cultivation method is based on the observation of what occurs in nature
- ✓ This principle is connected to the "soil biodiversity" concept.
- ✓ Agronomic practices modify these relationships, for example, accelerating cyclical transformations.
- ✓ This greater dynamism means that intensive agriculture land has a lower stability degree than natural soil.

CONCLUSION

The realization of an eco-sustainable agriculture is a major challenge to securing the increasing food demand, connected to rapid urbanization. UPA cannot only contribute to food supply but also to climate change mitigation, biodiversity, ecosystems services supply, sustainable agriculture implementation, etc. Thus, it is needed to approach ecosystem-based agriculture in such a way as to avoid agriculture remaining a part of the challenge responsible for ecosystem degradation.

Many studies have been conducted on UPA as value in providing social, economic and environmental co-benefits and ecosystem services, as analyzed in a recent review but the valuation of the effects of urban agriculture on soil biodiversity would merit further research.