



HOW TO IMPROVE THE YIELD AND WHY IS IT IMPORTANT?

Challenge

The importance of allotment gardens is usually pointed out by policy makers, researcher and gardeners to be about ecological and social benefits: increase in biodiversity, social inclusion, empowerment, participation, minority issues, etc. However, the importance of food yield seems to be understated. Since gardening is about producing food and low income groups are involved in urban projects in northern or southern Europe, it seems important to show ways of improving it. On one hand gardeners, especially those unemployed or with low income, probably desire more yield and quality production. On the other hand, more yield per area could lead to smaller plots and therefore more people could be involved in urban food production as part of the strategy to create self-sufficient cities.

Methods of yield increase on a polyculture (mixed crops) basis could create more and better food if adopted by policy makers and gardeners, also because some health problems in Europe are diagnosed as connected with malnutrition (FAO also reports it on the Eurasia continent) and the suggestion of adopting a diet rich in vegetables is becoming common. This can be done by promoting an integrated approach that aims to combine several strategies in order to optimise yield, including gardeners' participation in 'on site' garden research on polyculture methods.

How can yield be improved?

Gardeners can apply an integrated approach to existing techniques and improve technology adjusted to agroecology at the garden level, being involving in "on site" research.



Image 2 - Copying nature, Fábrica do Braço de Prata allotment garden, Lisbon, Portugal. Photo: Maria Sousa



Image 3 - High-density polyculture in a plot, Portugal. Photo: Maria Sousa

Message to Gardeners

If you want to improve yield you can use an integrated approach and experiment doing trials in your garden. Strategies could be:

- Application of a high density companion plants polyculture system.
- By mimicking nature, where plants naturally form communities, yield can increase using a higher number of species and more of each one, per square meter and also plant companionship methodologies. Compost and water use can decrease for the same amount of plants as well as pests and weeds. One trial used 16 species and an average of 5 kg/m² was yielded for UK, (Van der Velden, N.K. et al, 2012), and on a garden trial, 10 species and about a total of 25 plants combined were used per square meter and the yield was up to 8 kg in Portugal, (Sousa, M., 2014). This means about 60 ton/ha on average compared with conventional values of about 8 ton/ha.

Advice Note

- Drip irrigation is advisable in order to reduce the presence of water on leaves and stems, because there is more shade, since fungi occurrence could be reduced this way.
- Mulching or plastic sheeting for weed control is recommended. Otherwise more compost and water has to be used in order to yield the same quantity of vegetables.
- Knowledge of plant companionship is needed and a cultivation plan should be used in order to optimise the possible mixtures of plants.
- On a high density companion plants polyculture system the mix can vary for the next planting season, on the same plot.
- The amount of compost can be up to 9kg per sq. meter since there are more plants. This is less than the quantity used for the same number of plants when using more area.
- Tillage is not advised since it can destroy microfauna
- The time for harvest is longer since plants are all mixed up.

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References

- Guitart, D., Pickering, C. & Byrne, J.** (2012), Past results and future directions in urban community gardens research. *Urban Forestry & Urban Greening*, 11, 364– 373.
- Kremen Claire et al** (2014), "Diversification practices reduce organic to conventional yield gap". *The Proceedings of the Royal Society*, December.
- Oktat, H. A. & Zautra, A. J.** (2014) *Sowing Seeds of Resilience: Community Gardening in a Post-Disaster Context*. In: TIDBALL, K. G. & KRASNY, M. E. (Eds.) *Greening in the Red Zone*, pp.73-90. Dordrecht: Springer.
- Sousa, M.** (2014), *A caminho da auto-suficiência alimentar, Seminário Circuito curto-curto circuito - Agro ecologia: a caminho da auto - suficiência alimentar*, Culturgest, Lisboa, 25-29 June 2014



Image 4 - Portable ecological garden; Greenfest, Estoril, Portugal. Photo: Maria Sousa



Image 5 - Policulture medium density trial, UK. Photo: C. Atkin

Information for Policy Makers

Urban gardening has been proven to provide ecological and other social benefits among which providing for food, especially in Asia, Africa and South America where the need is bigger. In these cases sustainable methods are applied, mostly because there is no money to buy chemicals or other resources.

Urban garden plots are usually small and often the yield is already high. Trials made in Europe are also showing bigger yields than other methods.

Reasons to optimise the yield are:

- It can be helpful in facing economic crisis scenarios as is happening in Europe today.
- More people could be involved in urban food production as part of the strategy to create self-sufficient cities since it would be possible to use smaller plots for the same yield.
- Urban gardens can serve as laboratories for improving yield in sustainable conditions using agroecological methods, helping improvement of general sustainable agriculture technology and yield, which are still behind when compared with conventional agriculture.
- It can be used to raise awareness of gardeners about pollution problems caused by agriculture as

the improvement and maintenance of yield is proven to go together with nature-based solutions.

- Support urban gardening sustainable techniques for yield improvement
- Support field research that involves gardeners in several types of urban gardens serving as a laboratory experiments for general sustainable agriculture methods with high rates of yield.
- Promote industry technology improvements, in order to achieve improvements of specific machinery to allow improvement on seeding, planting and harvesting for polyculture methods.
- Other methods that can provide better yield on sustainable conditions should be researched, supported and applied to urban garden conditions.



Image 6 - Suburban organic high density crop production, south of Lisbon, Portugal. Photo: Maria Sousa

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References

Van der Velden, N.K. (2012), Multispecies cropping systems and participatory research. Ecological and Anthropological Approaches to Agrobiodiversity and Food systems University of Oxford. 6-7 December, 2012.

Van der Velden, N.K. Goldring, A., Remiarz, T., Brown, R., Fitzpatrick, I. (2012), "Polyculture productivity in family food production". 3rd European Congress for Conservation Biology, Glasgow, Scotland. 28th August – 1st September, 2012.



Image 7 - High-density polyculture production; south of Lisbon, Portugal. Photo: Maria Sousa

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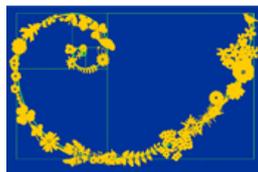


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