

Making Agriculture More Environmentally Sound

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Introduction. Population of the world is growing faster than ever. Pollution is also increasing at the same time. Huge population need huge amount of food to survive. Now the question comes that is there enough food to feed this entire population. If we can manage this food crises anyhow than another question comes forward, can we do this task without destroying our environment?

Materials and methods. One of the main reasons of greenhouse gas emissions is agriculture. So the concept is simple. The more you produce food by agriculture, the more it will cause global warming. We should find solutions to global warming really soon. Not only that agriculture needs much water to cultivate and also uses poisoned chemical to prevent insects.

It's a situation that we have to overcome. So according to this theory we have more people – more pollution. What should we do? Should we stop producing more food? That is obviously not the solution.

Shifting to ecologically sound agriculture could be a solution for pollution. Ecologically sound agriculture could create a new era to the solution of pollution and it could solve the food problem without pollution of the environment.

One research paper has been published at Nature (international weekly journal of science). It supports the sound agriculture theory. It says that “meeting the food security and sustainability challenges of the coming decades is possible, but will require considerable changes in nutrient and water management”. Researchers have investigated 17 crops around the world. These major crops cover almost 80% of total world. They have come to the decision that “if the present amount of water and fertilizer used in cultivation can be managed properly, it could increase the production up to 50–70%”. As the amount of food is increasing, so indirectly it helps to reduce pollution.

Results. We can combine all our effort and through proper management these resources can be utilized properly. We have to be focused for the future from right now. If the existing lands can be used under planed management with scientific method, it would be a great solution.

As a society, we may previously have been more interested in maximizing yield and the size of individual plants or plant products, but now our goals have shifted; we are interested in preparing our crops for continued climate change, developing more sustainable practices, finding crops that can grow in “marginal” agricultural areas, and promoting ecosystem services such as erosion prevention and promotion of nutrient recycling.

There are several ways in which new cultivars might improve on existing crops. First, they can be bred to have a smaller environmental footprint for instance, by requiring fewer nutrients (such as

phosphorus, which is becoming increasingly globally scarce) and water. Alternatively, it may be possible to create varieties that can be grown under more environmentally friendly conditions such as in mixed-species groups that mimic aggregations in natural ecosystems. Second, new cultivars could be designed to better tolerate climate change, which not only may increase the number of “extreme weather” events, but may also change temperatures, levels of precipitation, and host pathogen relationships. Plants that are inherently more tolerant of flooding, drought, heat, frost, and disease could therefore be better equipped to deal with future environmental changes. Third, current crops do not always provide “essential ecosystem services” or, where they do, may not supply them efficiently. Thus, new breeds of crops might be developed to perform a variety of jobs, such as improving soil health, reducing erosion, preventing runoff, and maintaining biodiversity.

Conclusions. As useful as it may be to alter the crops themselves it may also be important to vary the practices associated with their development and growth. For instance, individuals investigating new cultivars should grow them under “local” environmental conditions in order to fully ascertain whether the new breeds are suited for particular purposes. Plants will be impacted by soil conditions, temperatures, and prevalence of diseases, and may therefore react quite differently depending on the environment.

Regardless of how the new cultivars come into being, plant breeding is a “powerful tool” that can place agriculture and natural environmental processes in sync but only if a broad range of individuals, from breeders to ecologists to urban planners to policy makers, are willing to work together to “make this a reality”.

References

1. Brummer E. C., Barber W. T., Collier S. M., Cox T. S., Johnson R., Murray S. C., Olsen R. T., Pratt R. C., Thro A. M. Plant breeding for harmony between agriculture and the environment. – *Frontiers in Ecology and the Environment*, 2011. – № 9(10) – P. 561–568.
2. <http://allpollutionproblem.com/what-is-solutions-for-pollution>.

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