Opinion

The importance and application of minor crops plant breeding

Abstract

The following is to present the benefits which result from plant breeding with the use of minor crops projects. A review of the economic and environmental benefits from breeding indigenous species is also included. In addition, reference is made to the significant role that local varieties play for the broadening of the gene pool, which will be used in major crops breeding projects.

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Opinion

The area of plant breeding is one of great importance, as the proliferation of new varieties and hybrids results in considerable added value to production. In our effort to meet the ever-growing global nutrition needs, we have reached a high level of expertise, thereby improving resistance to plant diseases and pests as well as boosting yield. The constantly expanding knowledge of plant genetic diversity across the globe results in the cultivation of new species, much like it has always been the case at local level. These crops are called minor, their basic difference from major ones lying in the level of knowledge as well as the size of arable land.

One of the main characteristics of minor crops in many areas is that they are indigenous species, which means that much of the produce is collected from the wild. The cultivation of those species and the development of their quality characteristics through plant breeding are highly likely to encourage acceptance on the part of the market. As many of the crops being collected are endangered, accentuating the benefits which lie in their cultivation, which can only be achieved using plant breeding, seems like a highly effective way to save plant population. We have three important goals: to minimize the threat for endangered species, to increase producer's income and to create quality products.

Another aspect of minor crops includes the effort to encourage the cultivation of local varieties rather than the hybrids that have long been prevalent. In those cases, the produce is limited and of little financial interest, except perhaps at local level. However, breeding and preserving those varieties could enhance genetic diversity, which contributes to the addition of special characteristics, as part of major crops projects. While advanced technological methods are used in major crops, those are not applicable in minor crops, due to high cost. Limited financial resources result in fewer skilled professionals as well as fewer technological means, hence increasing the necessary time for a plant breeding project. Taking all of the above into consideration, it is clearly illustrated that a minor crops plant breeding project cannot keep up with a major crops plant breeding project.

As far as indigenous or even endemic species are concerned, we are required to put those projects into practice by following specific steps which start from the deep knowledge of the botanic characteristics of the species and the assessment of the genetic material. The organization of the plant breeding project will incorporate the knowledge of genetic diversity even with the use of related species, with a view to breeding the desired characteristics. At this stage, it makes sense to use the experience acquired from major crops plant breeding projects. Provided there is demand as well as a prospect of potential financial gain, research and cultivation can extend to areas with similar climate and soil characteristics.

As for the breeding of local varieties -whose commercial hybrids are mainly produced as part of major crops breeding- with minor crops projects, the primary goal is to maintain genetic diversity. Therefore, minor crops projects aim at maintaining the diverse gene pool which includes the special characteristics of the area, both organoleptic and referring to the environmental adaptability. Those characteristics will play an important role in the future due to climate change, especially as it concerns dry tolerance. There are numerous examples of local varieties which have adapted to dry climate at specific areas.

Conclusion

As it can easily be understood, minor crops breeding is not at all a minor issue. This research can result in significant financial gain, increasing revenue for a local community that will have sensibly exploited its local flora. What is more, projects focusing on local varieties can greatly contribute to broadening the genetic base which is getting narrower and narrower because of the strict hybrid plant breeding projects.

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Conflict of interest

The author declares no conflict of interest.