



Growing a Healthy Globe

Sure seed has a role in making people healthy, but it is also part of building a healthy planet. Consider the role seed has to play in improving the environment.

By Robynne M. Anderson

SEED PROVIDES the fields, forests, lawns and gardens that soothe and shelter us. Also, seed is a key tool for minimizing the environmental footprint of modern agricultural practices. Yet there is too often little recognition of the importance of seed to the environment.

By helping increase crop yields per hectare, plant breeding makes farming more efficient and productive. In the past half century, agriculture has fed twice as many people, using virtually the same amount of agricultural land. Plus, demand is growing not only for food, but also for fuel, fiber and feed. Many estimates suggest double the average annual production gains will be needed in the coming 30 years as compared to the past 30. Without the productivity gains of better yielding, more adaptable seed varieties, it would be impossible to meet these demands at all – let alone on a similar land base.

Consider too that habitat destruction is the biggest single threat to biodiversity. Not only is plant breeding innately focused on increasing biodiversity, sustaining existing levels of farmland protects wildlife habitats.

Sustaining Soil

Under these circumstances it is an added challenge to make the most of available land. An estimated one quarter of the world's agricultural land, pastures, forests and woodlands have already been degraded from misuse or overuse. Plant breeding will make



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it possible to engineer crop plants that tolerate compromised soils. For instance:

- rice that can thrive in marginal soil;
- tomatoes designed to grow in overly irrigated saline soil; and
- corn that is more tolerant of aluminum, a common soil toxin.

New technology is also being developed to allow nitrogen-fixing by the plant. This will reduce the amount of nutrients that need to be applied to the soil by making the plant capable of absorbing more nutrients. It also avoids water pollution by minimizing nitrogen run-off.

However, the greatest advantage to our soils from seed is already achieved. Herbicide tolerant crops have encouraged conservation or no-till agricultural practices, which prevent soil erosion and loss of ground moisture, improving soil biodiversity and soil fertility. A study from the Conservation Technology Information Center in West Lafayette, Indiana showed environmentally friendly, no-till conservation practices increased 35% since biotech crops came on the market in 1996. No-till farming increases organic matter, which can serve to sequester carbon dioxide from the atmosphere.

Carbon Credits

All this leads to the next wave of carbon savings. Arcadia Biosciences, a biotechnology company from Davis, California, is counting on a new nitrogen-efficient GM rice trait to create a new revenue stream for the company and farmers through the sale of carbon credits. Focused on China as the largest consumer of nitrogen fertilizers and the world's largest rice producer,

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Arcadia hopes to decrease the use of nitrogen fertilizers by Chinese rice farmers. Arcadia will, in turn, reduce the amount of greenhouse gases created from the use of the fertilizers, thus generating credits. The company intends to sell these credits on a global carbon credit exchange.

Monsanto Company has joined the Chicago Climate Exchange, North America's only voluntary, legally-binding greenhouse gas emissions reduction, registry and trading program. By 2010, the company will reduce its own direct carbon emissions from major U.S. operations by 6% from its 2000 levels or purchase carbon emission offsets as specified in the CCX contract.

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Saving our Green

Reclamation projects also reduce both carbon emissions and erosion. An important trend is the use of native plants that are well adapted to local environmental conditions, often requiring less watering, fertilizer and pesticides. They also increase biodiversity, providing habitat for a wide variety of animals, birds and butterflies. A specialty seed business has sprung up, supplying reclamation species including a large variety of grasses, ferns, wildflowers, shrubs and trees.

Saving our Souls

And, let's not forget the effect that a beautiful meadow, a majestic forest or a pretty garden can have on us as humans. We need a bit of green space to give us the escape to a quieter, calming world. The role that everything from trees to vines, ornamentals to grasses, plays in making the world a better place to live is (to quote the credit card commercial) priceless.

Seed offers all these benefits to the globe. It is not just about feeding people. It is about making sure there is enough land, water and clean air, and green space for everyone.

