



Supporting the ethical development and stewardship of seed

Five Ways Genetically Engineered Sugar Beets Threaten Organic

The threat of contamination to organic seed and crops is real, and risks compromising livelihoods, genetic integrity, and faith in the organic label. Below are talking points for why GE sugar beets are a serious concern for many organic vegetable seed producers, and the farmers and customers who rely on organic as an alternative to products derived from genetic engineering. Follow organic integrity issues at www.seedalliance.org.

1. Sugar beets are wind pollinated and easily cross with vegetable relatives

The species at issue (*Beta vulgaris*) is one of the few vegetable crop species that is wind pollinated. Some insect pollination occurs in beets, but wind accounts for most pollination events. Furthermore, beets are self-incompatible, meaning each plant must have pollen from a genetically different individual to produce viable seed.

Table beets and chard have large numbers of flowers per plant and produce large amounts of pollen. Crops within the *Beta vulgaris* species (table beets, chard, and sugar beets) are fully sexually compatible and mating between any two of these crops will occur if they flower in proximity to one another, as pollen from one will readily fertilize any of the other's flowers, resulting in viable offspring that produce viable seed.

Research shows that beet pollen can travel over 12 miles.¹ There's no realistic distance that completely isolates two cross-pollinating crops 100 percent of the time, especially in a highly concentrated seed production location like the Willamette Valley.

2. Complete segregation is not possible

Once contamination occurs, farmers can neither detect the presence of a transgenic trait without testing, nor can they remove the foreign DNA sequence from the crop. If contaminated seed is planted unknowingly, contamination will spread. For example:

1. The contaminated seed could be used as stock for a subsequent seed crop. As soon as contaminated seed is in the hands of farmers or gardeners scattered geographically, it could cause a wider distribution of GE contamination, especially if they are in or near seed production areas for any of the *Beta vulgaris* crops.

¹ Meier, F.C. and E. Artshwager. 1938. Airplane collection of sugar beet pollen. Science 88:507-508.



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2. Contamination can also spread through unintentional flowering when crops encounter stress – called “bolting” – releasing pollen to other *Beta vulgaris* populations within pollination proximity.
3. When seed crops from this species are grown during the first year of the biennial cycle they can flower prematurely if exposed to excessive cold temperatures, producing pollen from plots that are not normally considered in calculating isolation distances.
4. “Weedy” sugar beets growing in roadside ditches and other areas not under cultivation can spread pollen with GE traits and further contamination events.
5. Human error is also a factor, as mistakes regarding the physical mixing of roots in breeding programs spreads genetic traits from one seed lot to another.

3. The unwanted spread of GE traits threatens markets and livelihoods

Maintaining the genetic purity and proper isolation distances with these crops is difficult as it is without introducing a novel, engineered trait that is outright rejected by various markets. Cross-pollination between a GE crop and a non-GE crop of the same species causes a number of problems. Contaminated seed will not be acceptable for many farmers’ use because:

1. The contaminated seed cannot be sold into countries that do not allow GE crops or products, regardless of how it was grown.
2. The contaminated seed will not comply with USDA standards for organic certification, which does not permit GE content in organic seed. It can therefore not be sold as organically certified seed in the U.S. or into any international organic seed market that adheres to the standards established by the International Foundation of Organic Agricultural Movements.

4. “Partially deregulating” GE sugar beets will put chard and table beet seed at risk

USDA’s February 2011 “partial deregulation” decision that allows commercial planting of GE sugar beets before the final Environmental Impact Statement is complete – even under special measures – puts the integrity of organic seed and food crops and products at risk. This decision is a means to temporarily commercialize GE sugar beets through the unprecedented use of permits, a process typically only used for experimental field trials.

USDA’s oversight of experimental field trials has been seriously criticized by major entities, including USDA’s Office of Inspector General (2005) and the U.S. Government Accountability Office (2008). Insufficient oversight is evidenced by contamination events that involve GE pollen escaping field trials, including an escaped GE rice trait that has



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cost the U.S. rice industry more than a billion dollars. In 2006, GE rice not approved for commercial sale showed up in the U.S. long grain rice supply, half of which is exported. The field trials were abandoned in 2001, yet samples tested positive for the unapproved trait in the five Southern states where long grain rice is grown. And, in 2010, scientists revealed that USDA failed to disclose that GE bentgrass had contaminated at least 20 square miles in eastern Oregon. GE bentgrass is not commercially approved and the source of contamination is believed to be a field trial that ended more than five years ago.

The quality of organic seed is dependent on its genetic purity, including being free of GE contamination. This is particularly a concern for table beets and chard that are relatives to sugar beets and grown in the same region. Washington and Oregon account for over 80 percent of U.S. chard and table beet seed production, and 50 percent of world chard and table seed production. These crops are valued at millions of dollars. It's not just organic markets that will reject seed with GE contamination. This valley is home to a high value specialty seed trade with buyers in the Pacific Rim and European Union who will also reject contaminated seed. Companies are already looking to produce seed elsewhere, in different U.S. regions and abroad, because of contamination concerns.

5. Organic farmers shoulder the burden of protecting the integrity of organic seed

The burden of protecting the integrity of organic seeds, agricultural products, and markets is solely on the shoulders of organic farmers. This is an imbalanced and unfair burden.

In the event contamination occurs, farmers have no recourse to recoup damages because the question of who is liable has not been determined. They are left with the economic and agronomic costs of detecting and eradicating GE material; losing the genetic integrity of seed on which they rely; taking measures to avoid future contamination; and selling contaminated products into the conventional market, losing a premium for organically produced products.

The current regulatory framework for GE crops is inadequate. Farmers and farm groups have turned to the courts for action, to enforce environmental law and protect the integrity of organic and non-GE seed and products, and, still, USDA is allowing biotechnology industry interests to trump those of the organic and non-GE community.

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