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Adventitious Presence

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Introduction

Adventitious presence deserves discussion to understand whether farmers engaged in conventional, organic, and transgenic agriculture can coexist as neighbors using known and practical agronomic practices.
When a farmer buys and sows certified seed of his or her chosen crop variety, the crop starts with the highest degree of purity deemed commercially achievable, which then becomes increasingly less pure as various substances infiltrate at every step—from farm to granary to processor to retailer to consumer. The term *adventitious presence*, which describes such undesirable commingling, is new to many people, but it is encountered frequently in discussions of biotechnology and crop production. In the context of transgenic crops, the term describes the inadvertent presence of transgenic seeds or other material in conventional and organic crops. With respect to approved transgenic commodity crops, the issue is not agronomic performance, food safety, environmental protection, or animal or human health, because regulatory agencies have passed favorable judgment on these considerations when approving commercial release. Rather, concerns about adventitious presence are economic concerns: market access, contract specifications, and consumer preferences. The worry is that the mere presence of the transgenic materials decreases the value of the conventional or organic crop, especially in export markets.

Seed Purity

To address adventitious presence, it is important to consider purity levels of commodity crops generally. In agriculture, adventitious presence is simply the unintended incidence of something other than the desired crop. Adventitious presence includes small quantities of weed seeds, seeds from other crops, dirt, insects, or foreign material (e.g., plastic or stone). No farmer grows and harvests an absolutely pure crop, devoid of such impurities. Farmers try to grow the purest crops feasible because farmers who deliver a "clean" crop often receive higher prices for lower levels of adventitious presence. For commodity crops, for example, the U.S. Department of Agriculture (USDA) grain standards relating to #1 corn allow 2% broken corn and foreign material. For seed crops, the Association of Official Seed Certifying Agencies (AOSCA) tolerates 0.5% of seed of other varieties or off-types and 2% of inert material in certified hybrid corn as determined by visual inspection and count of grain samples. The AOSCA considers hybrid corn and other major crops as "pure seed" even though it averages only 98% pure (AOSCA 2003). As genetic testing for seed purity becomes more common and more sophisticated, AOSCA standards on seed purity are likely to change to reflect how these tests affect the commercially achievable standards.

During the growing season, the pure seed (e.g., 98% for hybrid corn) accumulates additional adventitious presence of impurities from weeds growing in the field, pollen from other crops growing nearby (particularly cross-pollinating crops), and volunteer seeds of other species inadvertently spilled or carried by machinery or vehicles. Farmers follow agronomic practices to keep their fields and growing plants clean, and they clean their equipment, vehicles, storage bins, and roadside ditches to protect the harvested crop from excessive adventitious presence. But no matter how conscientious farmers (or workers later in the distribution chain) are, adventitious presence will almost invariably still exist. Harvested commodity crops cannot be purer than the original bag of certified seed.

When a harvested crop shows too much adventitious presence, the farmer generally accepts a lower payment (lower grade and "dockage fees") or pays to clean the crop to a level below the desired threshold. But such cleaning is expensive and adds substantially to the final cost to consumers. And the product still is not 100% pure.

The USDA and AOSCA standards presented here relate to approved commodity crops. Specialty products, such as plant-made pharmaceuticals, will require stricter purity standards, greater monitoring, and stronger mitigation in case of excessive admixtures. Unapproved crops, whether from conventional or biotechnological breeding, present different adventitious presence issues than approved crops do. Adventitious presence of an unapproved crop, whether a genetically modified organism (GMO) or not, is likely to result in recalls of seeds, foods, and feeds.

Adventitious presence is thus both historical and ubiquitous. Commingling at low levels among conventional, organic, and transgenic commodity agriculture is a fact that is neither surprising nor unique. Farmers and others in the commodity chain have known about and dealt with adventitious presence for decades. Similarly, it should be expected that farmers and others have the experience to deal with adventitious presence among conventional, organic, and transgenic agriculture.

Coexistence

Because farmers always have had to deal with adventitious presence from their own and neighboring farms, farmers and processors historically have accommodated a certain acceptable amount of adventitious presence in harvested crops. Recognizing an acceptable level of adventitious presence means that farmers can coexist with their neighbors as well as with other crops of their own. Coexistence describes the situation of farmers growing different crops while recognizing that adventitious presence will occur in each, adopting reasonable practices of good stewardship and husbandry to minimize adventitious presence, and working in a neighborly fashion with adjoining farmers. By using common agronomic practices and building upon their past coexistence experiences, farmers have grown crops that the market demands as having a high purity level. Examples of same-species crops that need to be segregated—and that predate transgenic agriculture—include canola (cooking oil) and rape (industrial oil) grown in separate (sometimes adjoining) grower districts; malting barley and feed barley; and different varieties of corn grown for fresh food (sweet corn), feed for animals, and industrial use (starch). The farm community and society long have supported coexistence that allows farmers to choose the crops and farming techniques suitable for their farms and the market's demands.

Jurisdictions studying the question of adventitious presence discover that the financial cost and the difficulty of compliance escalate with higher degrees of purity sought. For example, the European Commission-requested study of May 2002 concluded that at the 0.3% level for seed rape and at the 1% level for food-feed corn and potatoes "all farm types…will be able to meet their thresholds provided they change the set of current farming practices…." But the same study concluded that "a 0.1% limit will be extremely difficult to meet…even with significant changes in farming practices." Two studies conducted in Switzerland also illustrate the contrast between findings: one study by an environmental group limits adventitious presence at the 0.1% level with significant margins of safety (distance between crops); the other study by the Swiss federal office of agriculture sets tolerance at 0.5% and bases distances between crops on the agronomic characteristics of the crop itself. Indeed, if the acceptable level of adventitious presence for transgenic crops is at the percentage the European Union (EU) adopted for labeling a product as genetically modified (0.9% of content), then, as indicated in several studies by PG Economics, coexistence can be achieved without depriving farmers of their choice in agricultural methods or imposing excessive costs on them.

Selected Legal Issues Arising from Coexistence

Adventitious presence does not affect organic certification for organic farms or organic products. The USDA's National Organic Products (NOP) Final Rules contain these clarifying comments:

> When we are considering drift issues, it is particularly important to remember that organic standards are process based. Certifying agents attest to the ability of organic operations to follow a set of production standards and practices that meet the requirements of the Act and the regulations. This regulation prohibits the use of excluded methods in organic operations.

> The presence of a detectable residue of a product of excluded methods alone does not necessarily constitute a violation of this regulation. As long as an organic operation has not used excluded methods and takes reasonable steps to avoid contact with the products of excluded methods as detailed in the approved organic system plan, the unintentional presence of the products of excluded methods should not affect the status of an organic product or operation." NOP Final Rules 2000 at pp. 33–35, http://www.ams.usda.gov/nop/NOP/standards/FullText.pdf

In addition, the USDA–NOP has informed state agricultural departments that no organic farmer has lost organic certification as a result of adventitious presence of transgenic material. Similarly, in Canada, the Saskatchewan Queen's Bench court, in a class action lawsuit against biotechnology firms, received no evidence that any organic farmer had lost organic certification as a result of adventitious presence of transgenic material.

Depending on the contract specifications, adventitious presence can affect premiums and market access for both conventional and organic producers. Farmers voluntarily sign these contracts with strict specifications. Historically, farmers who voluntarily accept contract risk bear the burden of meeting their contract obligations regarding purity of delivered product. The higher premiums and market access compensate farmers for accepting stricter contract specifications. Moreover, farmers and processors who promise "GMO-free" crops or products are promising more than common knowledge and common sense about adventitious presence dictates.

Recognizing the reality of adventitious presence, the International Federation of Organic Agricultural Movements, in its guidelines on transgenic agriculture, wrote:

> Organic certification shall not imply it is a "GE-free" [genetically engineered-free] certification. Rather it shall be presented as guaranteeing "production without GE/GMOs." As there is no guarantee that organic products are 100% free from any GMO pollution, organic products shall not be marketed as "GE-free," unless there are specific safeguards and certification procedures for that specific product. Organic producers and associations shall actively inform the consumers of this fact to ensure fair marketing claims and to avoid future debates about consumer deception.

Adventitious presence should not create legal liability for infringement under patent law. There are no infringement cases involving a truly innocent farmer being sued for having transgenic adventitious presence in a crop. In all infringement cases involving both conventional and transgenic crops, except one, farmers charged with infringement have admitted that they saved patented seeds intentionally. In the one exception, Schmeiser v. Monsanto Canada, Inc., the Canadian courts at the trial level, appellate level, and Supreme Court level found factually that Mr. Schmeiser purposefully saved and planted patented seed that he knew or should have known contained a patented gene for herbicide tolerance. Moreover, if a case of a truly innocent farmer, with an adventitious amount of transgenic presence in a conventional or organic crop, were to come before the courts of the United States or Canada, it is highly likely that judges would interpret patent law to protect the innocent farmer from infringement liability.

Consumer Preference

Consumers who desire to have minimal adventitious presence of transgenic seeds or material in their foods have several alternatives. In Europe, consumers can purchase foods that do not have a label indicating transgenic content (0.9% content or above). They can do the same in other countries (e.g., Japan, Korea, and Australia) where labeling laws require information about transgenic content above legally specified levels. In all countries, consumers can purchase products labeled "organic," because organic production standards prohibit organic farmers from intentionally using transgenic seeds or materials and require organic farmers to take reasonable measures to limit adventitious presence.

Conclusion

Adventitious presence is a common situation in the agricultural community. Coexistence among farmers, different crops, and different agronomic practices also has been a common situation in the agricultural community. Legal issues do not cause a different evaluation of adventitious presence and coexistence with respect to transgenic agriculture. Farmers, seed companies, grain handlers, and grain traders will need to respond to customer and consumer preferences. In so doing, they assuredly will adopt new techniques for genetic identification, agronomic practices (e.g., identity preservation, grower districts), grain handling, and market segmentation. Therefore, adventitious presence should continue to be a manageable issue between neighborly farmers, even with the expansion of organic and transgenic agriculture.

References

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PG Economics, Ltd. has completed a number of studies about coexistence, specifically relating to the EU, North America, Spain, and the UK. These studies are available at www.pgeconomics.co.uk/crop_coexistence_principles.htm

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