

Sharing a Fenceline: Keeping the Peace when Pesticide Drifts

A Decision Case Study

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A farming couple engaged in fruit and vegetable production undertake organic certification to meet the needs of their customers. However, they struggle to protect the integrity of their organic products when surrounded by conventional farming.

Nate and Amanda Nelson* met in college and came into farming somewhat unexpectedly. Nate grew up on a corn and soybean crop farm in central Minnesota, but was not encouraged to go into agriculture. Amanda did not grow up with an agricultural background, but her parents fostered a love in her for the outdoors and the natural environment.

After college, Amanda and Nate moved to the West Coast and lived there for a few years. Amanda worked in a position that used her design degree but also connected with the food movement. Her interest in farming grew and she decided that working an office job didn't suit her. Nate shared this vision and together they decided to move back to Minnesota to be closer to family, build community connections and explore growing food as a career.

In the early years after their return to Minnesota, Amanda and Nate lived in the metro area and worked various agricultural jobs. It was while working as a farm manager

** While these cases describe actual situations, names and other identifying details have been changed to protect the identity of participants.*

for an organic CSA farm that Amanda gained the insight, skills, and confidence she needed to make the decision to become a farmer. (For information on CSAs in Minnesota, please visit: <http://minnesotagrown.com/product/community-supported-agriculture-csa-farms/>.) Once they committed to farming, Nate and Amanda decided to relocate from the metro area to the town near Nate's parents' farm and rent farmland.

Back to the Land

For a few years, Nate and Amanda lived in town, rented, and commuted to their land. They started to build community connections and relationships, continuing to work other jobs as they established their farm and CSA market. Nate and Amanda grew a range of vegetables such as spring greens, tomatoes, root vegetables and winter squash for the 30 to 40 people who subscribed to a weekly share of produce.

After renting land and operating the CSA for several years, Nate and Amanda decided they were ready to purchase their own farm and produce food for their local community. One day, Nate's dad pointed out an old 10-acre dairy farm in the area that was up for sale. It

was conveniently located near their family, had a lovely farmhouse, and five tillable acres—a reasonable size to continue at the scale they were farming and also expand their enterprise to include more perennial crops such as apples, cherries and pears. They decided to buy the farm and become landowners (see *EXHIBIT A: Nate and Amanda's Farm*).

Nate and Amanda had always incorporated pesticide-free farming practices in their production methods, even when they were renting. They did not pursue organic certification on their rented land for a few reasons, but mostly because they didn't know if they would be on the land for the three years that were required for transitioning to organic. After they bought their land, however, Nate and Amanda considered the value of the certification for marketing their produce. Their customers already appreciated their pesticide-free practices, but Nate and Amanda recognized that organic certification would make them stand out from other producers in their region. Now that they were settled in one place, they decided to start the certification process.

Nate and Amanda had studied the requirements for organic transition and understood it was going to be a challenge for their new land. Although they had 40 feet of a grass-alfalfa-clover buffer between their farm and neighboring land, their farm was bordered on all sides by row crop farmers who used a regimen of herbicides and insecticides to manage weeds and pests. None of their closest neighbors were growing fruits and vegetables for direct markets and no one was organically certified. In their neighbors' eyes, Nate and Amanda were not only new farmers, but also new farmers growing unusual crops using unconventional

methods. They recognized that it was going to be important to build good relationships with their neighbors and to communicate carefully. Little did they realize that their relationship-building skills would be tested in the very first year on their land.

What to Do about Drift?

One day very early in the first season of their transition to organic, Amanda came home from her part-time work around lunch and spotted a tractor boom spraying a neighbor's soybean field. It was a windy, hot, dry day. She shut her windows and watched the truck as it started to spray the southern field, just across the country road from their land. A gusty wind was blowing from the south across the fields. She watched the boom truck arm rising and rocking in the wind, creating an angle where the wind caught the herbicide and it appeared to drift toward their young tomato and pepper plants. She called the neighbor to see what they were spraying and what their plan was for the field. It turned out to be glyphosate, which was a systemic broad-spectrum herbicide, meaning that it can kill most plants. She was told that the spraying was contracted with the local co-op and that complaints should be handled through them. Later that evening when Nate came home, they inspected the tomato, eggplant and pepper fields. It appeared as though the plants were okay (see *EXHIBIT B: What to do if you Suspect Pesticides have Drifted onto Your Crops*).

However, a week later, the leaves and growth on Amanda and Nate's eggplant and tomato plants started to look shriveled, stunted and unusual. They were not thriving and did not look like they should for the time of the growing season (see *EXHIBIT C: Identifying Herbicide Damage*). It was concerning to

Amanda and Nate. They realized they needed to call the co-op to report a problem and have their plants tested for pesticide application. As new young farmers to the area, Nate and Amanda were hesitant to make this call. They wanted to foster good relationships with their neighbors and didn't want to create a conflict with them that might make farming in their community difficult.

At the same time, they were very concerned about how this potential drift might affect their transition plan. If a prohibited substance was found to have contaminated their field to a great degree, they might need to start over on the three-year time period of transition (see *EXHIBIT D: Organic Regulations and Pesticide Drift*). They were also concerned about what to tell their CSA customers who had come to expect pesticide-free produce. Would their customers lose trust in them? Would they demand their money back?

There was a chance that the damage they were seeing was not from the pesticide spray. Organic farms are required to have strips of land, called buffers, between their fields and non-organic land to protect from prohibited substances. At 40 feet wide, their buffer between the fields was quite significant and should have been sufficient to protect their crops under most. However, they couldn't explain the damage to their plants. A pesticide test would be the only way to conclusively determine whether or not drift damage had occurred.

Nate and Amanda knew they had to do something about the suspected overspray problem, even though it might open a conflict with their neighbors. Although they had decided to start the process of organic transition for their farm, they hadn't started

working with an organic certifier yet, so they turned to a farm business mentor they had known for a few years. This person recommended that Nate and Amanda call the co-op that did the spraying. The co-op forwarded the issue to their agronomist who eventually called back and arranged an on-farm visit. The co-op sent a specialty crop person to take samples to test for herbicides. The co-op let Nate and Amanda know a week later that their samples indicated pesticide drift. The co-op compensated them for the loss of their plants due to herbicide drift.

Nate and Amanda could see that their tomatoes and eggplants were going to be a total loss. They salvaged the crops not affected by drift and decided to delay their organic transition by a year. They were committed to becoming certified organic and this event brought home the fact that they needed to start working with an organic certifier and have a plan to protect themselves from this happening again.

There are various ways to try to prevent damage from drift – physical (such as modifying buffers), social (such as communicating with neighbors) and cultural (such as timing planting of sensitive crops). What steps should Amanda and Nate take to protect themselves and their organic production from pesticide drift in the future?



Exhibit A. Nate and Amanda's Farm

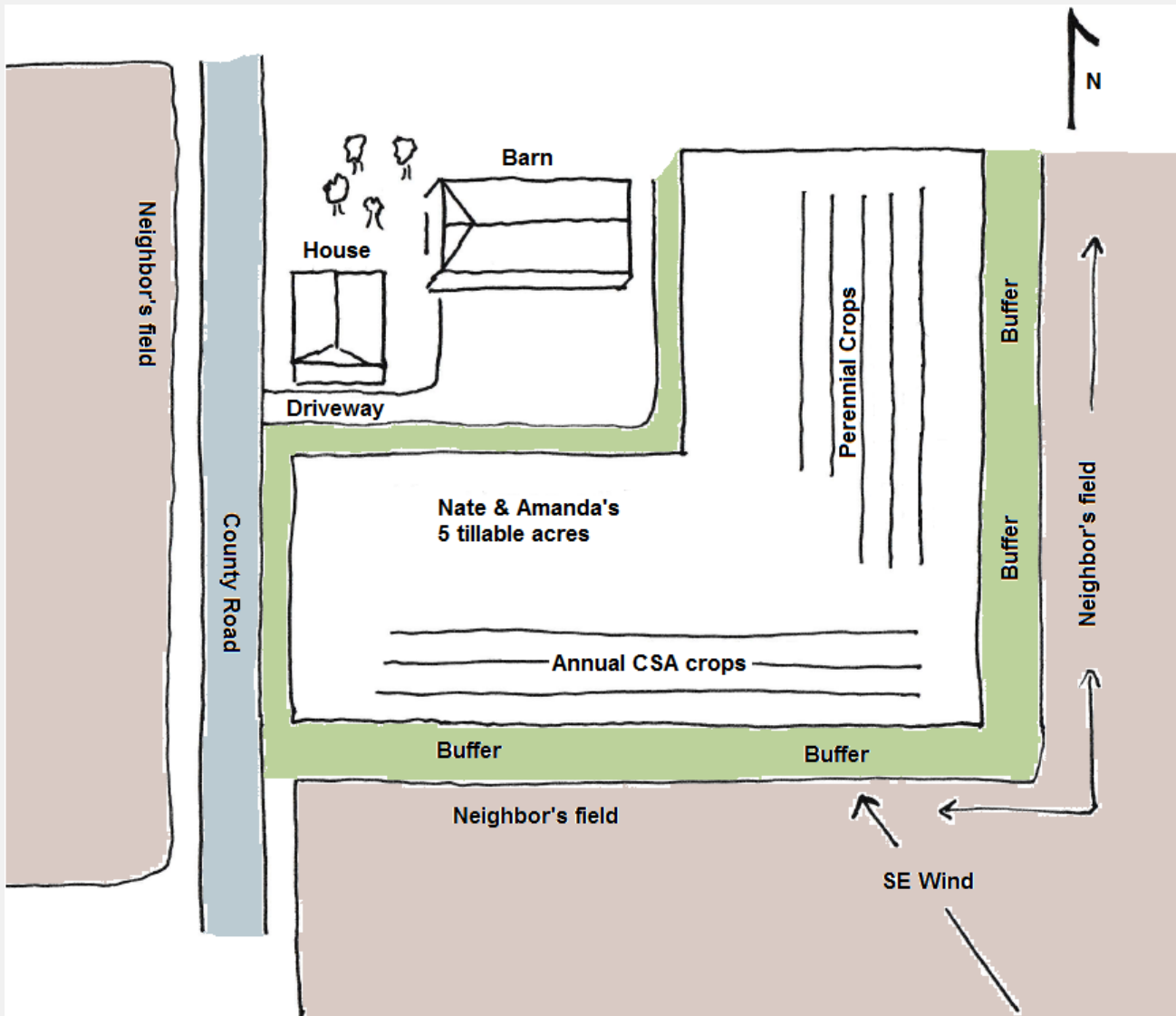


Exhibit B. What to do if you Suspect Pesticides have Drifted onto Your Crops

Organic farmers are required to have a plan in place for preventing pesticide drift onto their crops. However, sometimes drift happens, despite the best planning and care. If an organic farmer witnesses a potential drift issue or suspects one has happened, there are some steps they should take to ensure they have all of the information and evidence they need to seek compensation, should that be necessary.

- 1. Document Details:** If the organic farmer witnesses questionable spraying in process, contact the sprayer to try to prevent further damage and document sprayer information to have available should that information be needed later. Taking time- and date-stamped photos or videos of neighboring spray activities, if possible. Farmers should also record as much information about the situation and conditions as possible, including time, temperature, wind speed and direction, and type of pesticide being applied. If the organic farmer is sprayed, or feel they may have come in contact with the spray, they should bag their clothes in case they are needed for testing (they should also shower as soon as possible).
- 2. Contact Organic Certifier:** An organic certifier has likely encountered many drift and potential drift situations and will be able to provide resources and support for navigating the next steps. In addition, it is important to be transparent and honest with certifiers to maintain a trustworthy relationship. In Minnesota, confirmed pesticide drift does not always mean a loss of certification.
- 3. Contact the State Department of Agriculture:** Not every state has protections for organic farmers who experience pesticide drift. Contact your state to understand their process. Here is an example of how the issue is handled in Minnesota:

The Minnesota Department of Agriculture (MDA) tests for pesticides and if the test is positive, the co-op is fined if drift was found. However, it can take several months to determine drift and it is still up to the injured party to get compensation for their loss. Farmers can also choose to collect their own samples and sent them for testing themselves. This option can lead to faster results, but it requires them to pay for testing themselves. Contact MDA to report drift in MN (<http://www.mda.state.mn.us/chemicals/pesticides/complaints/complaintprocess.aspx>).

Source: Carlson, S. and Kolbe, L. 2016. Pesticide drift awareness important for farmers, rural residents in Iowa. Practical Farmers of Iowa. <http://www.practicalfarmers.org/news-events/newsroom/news-release-archive/21544/>

Exhibit C. Identifying Herbicide Damage

The term “pesticide” is used as a generic term for substances that are used to kill unwanted plants or insects. Specifically, herbicides are substances that are toxic to plants and are used to destroy unwanted vegetation. Insecticides are substances used to kill insects. Herbicides and insecticides may interact differently with plants. Unless a farmer witnesses pesticide land directly on his crops, other elements such as drought, disease, pests, and weather events can also make determining the exact cause of plant damage complicated. In many cases, samples of leaf tissue will need to be taken and analyzed professionally to get a conclusive answer. Here are some basic warning signs to look for when identifying herbicide drift damage:

1. More than one plant species is affected.
Example: If eggplants and tomatoes (both from the nightshade family) are showing damage, but carrots and cucumbers nearby aren't, the damage may be from a disease affecting nightshades or a nightshade-loving pest.
2. Symptoms appear only on one portion of the plant or plants.
Example: Damage from hail or insects will likely affect multiple areas of the plant, whereas chemical drift will affect the areas where the sprayed substance has landed, which is often the leaf canopy.
3. Other causes of damage have been ruled out, such as weather incidents, nutrient deficiencies, air pollution, insects, diseases, virus, etc.

The following are symptoms of some common herbicides:

Herbicide	Symptoms
2,4-D and MCPP	Twisted and bent shoots and petioles. Leaves become twisted, strappy, and finely dissected and stay small in size. Injury is observed on the youngest leaves. Plants rarely outgrow the injury. Tomatoes and other members of the nightshade family are particularly susceptible.
Dicamba	Dwarfed, distorted and/or discolored foliage
Glyphosate	Arrested or slow growth, yellowed leaves, turning to brown over time. Leaf distortion and bleached or dead spots may occur. Symptoms may not appear for 7 to 10 days after exposure.

Source: University of Maryland Extension; <https://extension.umd.edu/growit/herbicide-damage-vegetables>

Exhibit D: Organic Regulations on Pesticide Drift

According to the USDA's National Organic Program:

“When residue testing detects prohibited substances at levels that are greater than five percent of the Environmental Protection Agency’s tolerance for the specific residue detected... the agricultural product must not be sold, labeled, or represented as organically produced.”

Pesticide drift onto certified organic fields can cause considerable issues for a certified organic farmer, including economic losses, health issues and damaging the biodiversity and soil biology of their organic system. It may also require additional reporting, installing more buffers and paying for additional testing. Two of the most important things an organic farmer can do to protect their farm business is to 1) establish a strong working relationship with their certifier, and 2) keep meticulous records.

Additional points regarding pesticide drift:

1. Certification Providers (e.g., USDA and/or state organic programs) can require testing of organic crops.
 - a. May be requested either pre- or post-harvest
 - b. May test inputs used in production of a product that is intended to be sold, labeled or represented as organic when there is reason to believe it has come in contact with a prohibited pesticide.
 - c. Positive results of these test will require an investigation and producers will need good record-keeping to prove they did not apply the prohibited substance.

2. Loss of certification as a result of drift is a possibility, but the NOP Final Rule states, *“[O]rganic standards are process based . . . As long as an organic operation has not used excluded methods and takes reasonable steps to avoid contact with the products of excluded methods. . . [the] presence of the products or excluded methods should not affect the status of an organic product or operation.”* (<https://www.gpo.gov/fdsys/pkg/FR-2000-12-21/pdf/00-32257.pdf>)

Source: Organic Farming, Drift, and the Law: Addressing the Legal Mechanisms Enabling Pesticide and GMO Drift in American Agriculture, University of Oregon Environmental and Natural Resources Law Center’s Food Resiliency Project. <https://law.uoregon.edu/images/uploads/entries/Right-to-Farm-READY-FOR-PUBLISH.pdf>

Teaching Notes:

Case Objectives:

- Understand how pesticide drift occurs and what abiotic factors contribute to drift.
- Become familiar with herbicide symptoms and how to document plant damage.
- Become familiar with USDA national organic program regulations concerning pesticide drift.
- Discuss tradeoffs among preserving relationships with neighbors and protecting crop integrity.

Use of the Case:

This case is developed for use by extension educators, post-secondary instructors, state agency personnel, and others interested in increasing understanding of the organic transition process.

Materials Needed:

- Copies of the decision case study/ies on which to make notes as participants read.
- A laptop and projector to show slides of the farm, the markets, and the farm family. It could also be used to project discussion questions, certification requirements, or other materials of interest.
- A “U” or horseshoe-shaped seating arrangement for maximum participation among participants and the facilitator.

Dealing with Controversy:

Often in the discussion of a decision case study, participants will disagree about certain issues. While this is a mark of an effective case, the facilitator should keep the discussion from becoming argumentative and unproductive. Participants should be reminded that there are many points of view and to keep the discussion atmosphere constructive and nonthreatening. If desired, techniques such as role-playing or role reversal can help participants discuss the issues in a less personal way.

Use the following strategies to facilitate a productive, healthy discussion where controversy may be involved:

- Establish ground rules. These may include: allowing only one person at a time to speak; no one should speak twice before everyone has had a chance to speak once; no criticizing of others’ comments, etc.
- Encourage participants to use “I” messages when stating their viewpoint. Avoid using “you” or blaming statements.
- Ask clarifying questions such as, “Why do you think that?” A major communication problem is misunderstanding what was said.
- Ask participants to try to imagine the situation from the other person’s point of view. (Role-playing can also help with this.)
- Encourage participants to focus on what they want in the future or where they would like to go, rather than where they have come from or what has happened in the past.

Lesson Outline:

Discussion of this decision case study can last from 20 to 60 minutes, depending on the degree of preparation by the participants and the desired depth of the discussion. The outline below is one example of the way a facilitator might structure the discussion. In general, a decision case study discussion is a forum where participants talk to each other in addition to the facilitator. The format described here is useful when advanced preparation of the participants is not possible. If desired, the facilitator can include additional information on local crop production and social issues to enhance discussion and create a broader understanding of those topics.

- Introduction
- Facilitator introduces the case study and describes the goals and approach to be used
- Focus on a real situation
- Practice problem solving
- No single right answer – each person and situation is unique
- The Decision Case Study
- Facilitator introduces the decision case study.
- Participants read or reread the narrative of the decision case study
- Facilitator divides the participants into small groups of 2-4 people and asks them to discuss questions.
- Participants return to large group and share key points of their discussion
- Facilitator guides a group discussion on the remaining questions
- Conclusion
- Group members may select a preferred option or facilitator may have participants write individually and describe their decision in response to the dilemma and the rationale for the response
- Closing comments

Discussion Questions:

Below are examples of the kinds of questions the decision case study facilitator can use to stimulate discussion of the issues in this case. Participants may discuss some of these questions in groups of two to four and some questions as a large group. The questions used can vary depending on your time limit and the issues you wish to discuss. Other questions may be added as needed and appropriate to the situation.

1. What are buffer zones, and why are they important for certified organic farms?
2. What are some of the symptoms of herbicide drift on plants? How can you distinguish herbicide drift symptoms from other symptoms of plant damage?
3. Once symptoms of drift were discovered, how did it affect the way that Nate and Amanda transitioned to organic?
4. How might an accusation of pesticide drift affect Nate and Amanda's relationship with their neighbors?
5. How might local perceptions of organic vs. conventional agriculture affect community discussions of pesticide drift?
6. If you were in Nate and Amanda's situation, what would you do to protect yourself from potential pesticide drift? How and why?
7. Are more regulations regarding pesticide application and drift needed to protect organic crops from drift? Why or why not?



The following resolution to the case study, along with an analysis, is offered for the benefit of the instructor in preparing for leading a discussion of the decision case study. The information it contains and the final resolution of the decision case study may or may not be disclosed to discussion participants, at the instructor's discretion. Should the resolution be shared with participants after the discussion takes place, the authors suggest debriefing the epilogue and final decision with the students.

Epilogue:

After going through this experience, Nate and Amanda reaffirmed their belief that one of the most important actions they can take to protect their farm from drift is fostering open and direct communication with their neighbors. They have started a practice of personally visiting with their neighbors and together they discuss timing and spraying schedules to avoid conditions that promote drift such as windy days. Their neighbors have agreed to contact them when they are going to spray and will work with their co-op sprayer to ensure the conditions are appropriate.

On their farm, Nate and Amanda put up “Do Not Spray” signs along their property line so that it is clear what type of farm it is. They have also developed a drift mitigation plan that includes growing sensitive crops in their high tunnel, registering their farm as organic on "Drift Watch" website (<https://mn.driftwatch.org/>), and sending written notice of organic certification to all immediate neighbors, landowners, tenants, the power company, the township, and the co-operative.

Even with the best preparations, accidents can happen and, as organic farmers,

Amanda and Nate must prove they did their due diligence to prevent contamination. After the drift incident, they developed a relationship with their future certifier and worked with her during transition. Their certifier gauged their situation and determined that their current 40-foot buffers should be a reasonable and adequate defense against drift under their typical conditions. They learned more about pesticide contamination and how organic farming is a process-driven system where ultimately there is no guarantee of a 100% pesticide-free environment. The established presence of drift does not necessarily mean a loss of certification if it is inadvertent, but it is up to their certifier to determine the consequences based on the details of each case. Nate and Amanda, of course, can never purposely use prohibited substances themselves on their farm as organic farmers or they would lose their certification for sure!

Ultimately, Nate and Amanda’s experience with pesticide drift was a hard lesson to learn. In the future, they know what to do if a similar situation occurs and are hoping the steps they have taken will prevent drift from happening in the first place.