



# Growing and Selling Seed in Arizona: An Overview of Policy and Regulations

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## Understanding Seed Farming

Insight into the seed industry in Arizona can be confusing for new seed farmers and companies entering the business of seed production. Seeds can be grown in Arizona for fruit and vegetable production, forage for livestock, food or non-food products, and land restoration purposes. The Seed Trade Association of Arizona (STAA) stated “Arizona produces millions of dollars’ worth of seed that is distributed throughout the world.” Unfortunately, there is no readily available data as to the impact the Arizona seed industry has on state and local economies and how much seed is grown in the state specifically for consumer use.

Seed-based agriculture is a unique type of agriculture that requires a specific skill set for farmers, plant geneticists, plant breeders, researchers, and agronomists. Close attention must be paid to the development of the desired product including the genetics, the tolerances to the state’s various challenging environmental conditions, avoidance of unintentional outcrossing, and increasing resistance to pests and diseases. Additional considerations include patented plant breeding processes or genetics, organic versus conventional farming systems, indigenous access to traditional food and fiber seed, specialty seed crops, seed accessibility in food deserts, and open seed source programs.

Seed is one of the hardest crops to grow in relation to time invested from start to finish. For example, a market farmer who grows different varieties of peppers for a local farmers market will plant the seed or pepper starts, maintain the plant to its fruiting stage, and then pick the pepper when it is at its peak for visual and taste appeal to the consumer. That farmer usually has a 90-to-120-day commitment from start to market. A seed farmer must let the fruit stay on the plant until the seed is fully formed and ready for

processing. This can add an additional 20 to 40 days to the farmer’s commitment to the plants. During this time there are additional grower resources spent on pest and disease prevention, irrigation, and field maintenance. There is also specialized seed cleaning equipment used for processing seed, the seed must be tested for germination, and labeling requirements must be met which are additional costs above the required farming equipment.

Additionally, farmers who sell at markets usually do not focus on the specific genetics of the varieties of crops, and interplant multiple varieties of one plant family in a field or area with minimal concern for cross-pollination. There are a few exceptions to this rule. Overall, mixed planting allows for maximizing the availability of different types of produce to appeal to a variety of consumers, which then can maximize farm profit and return. On the other side, the seed farmers are focused on future genetics and avoidance of crossing genetic traits unless intentional crossing and breeding is a part of their farm structure. They usually can only plant one type of a crop in a set area. Strict control measures will be in place for seed farmers to maintain good genetics for their seed.

Focusing on genetics means the seed producers have to employ a variety of techniques to avoid cross-pollination. These can include growing one variety of a crop a specific radius away from a different variety of that same crop family, using flower bagging with hand pollination, closed pollination greenhouses, tenting, and using pollination control bags or blocks around plants that are self-pollinators. In the case of intentional cross-pollination by plant breeders, the process is carefully controlled to cross plants for desired traits and usually excludes natural pollinators.

## Why Seed Regulation is Important

**Disease and pest prevention** – Seeds can carry disease if not grown, harvested, treated, or stored correctly. Growing healthy plant crops is the foundation of disease prevention for future seed. Disease usually comes from a pathogen on the plant, which may have come from the surrounding air or from the soil. Most farmers are familiar with damping off which is a fungal infection of the seedling. Another disease is bacterial wilt. Seeds can carry fungi, bacteria, and viruses which are not visible to the naked eye on the seed coat. It can be tested for in a laboratory if there are concerns with diseased seeds. A farmer can unknowingly share a disease from their farm to gardens all over the state if they are not practicing good seed growing and harvest techniques, or testing and evaluating plants and seeds for disease.

Pests cause similar concerns to seed producers and consumers. Pest eggs can be laid on seeds or plant parts, sold to an unsuspecting consumer and they introduce the new pest to their garden or farm. The biggest issue with pests establishing in a new area is they usually do not have natural predators to control their population. This can cause major damage to agricultural crops in the state.

Both pests and diseases can be controlled on seeds by growing healthy plants, following phytosanitary guidelines, treating seeds with specific chemicals depending on the concern, harvesting, and handling seeds correctly, practicing good biosecurity, and cleaning all equipment regularly and between seed batches. Regulation of pest and disease concerns in Arizona is done by the United States Department of Agriculture (USDA) – Animal and Plant Health Inspection Service (APHIS) and the Arizona Department of Agriculture (AZDA).

**Transport of Noxious Weeds** – Noxious weeds are a major problem in Arizona. Seed producers can run into issues with noxious weeds primarily when cleaning and processing seed after harvest. This is mainly found in grain or pseudo grain crops that are harvested by mechanical means and have an increased chance of the equipment harvesting noxious weed seed or plant parts in addition to the desired seed crop. However, all seed crops can have an accidental introduction of noxious weed seed or plant parts during harvest, processing, and packaging. Primary means used for keeping noxious weed seed out of seed crops include weed management in the fields, cleaning seed processing equipment before and after harvest, cleaning and packaging, careful sorting of seed with quality control measures, and following seed lot testing guidelines.

Regulation of noxious weeds in Arizona is the responsibility of the AZDA, APHIS having responsibility if seed or plant material crosses state or federal borders. The AZDA maintains a Noxious Weed list found at <https://>

[agriculture.az.gov/pestspest-control/agriculture-pests/noxious-weeds](https://agriculture.az.gov/pestspest-control/agriculture-pests/noxious-weeds) and is updated as needed when new plant species present problems to Arizona lands. Another good resource from University of Arizona Cooperative Extension is the paper “[Non-Native, Invasive Plants of Arizona](#)”.

## Arizona’s Responsibility for Seed Crops

AZDA is charged with protecting the state’s agricultural resources as identified in Arizona Revised Statutes (ARS), Title 3 – Agriculture found at <https://www.azleg.gov/arsDetail/?title=3>. Since seed is paramount to Arizona’s agricultural industries, and is also its own industry, the AZDA has oversight. The AZDA also has its own rules; the Arizona Administrative Code (AAC). Most seed-related information is found under AAC, Title 3 – Article 4 (<https://azsos.gov/rules/arizona-administrative-code>).

## Relevant Federal Laws and Information for Arizona

**Federal Seed Act** – The Federal Seed Act of 1939 with the latest revision in 2020, has the main purpose of protecting the consumer regarding purchasing seed that is labeled correctly and performs to a set standard. This is done by requiring standardized testing on vegetable and agricultural seeds, implementing required labels for seed, and keeping track of varietal names so new hybrids or plant developments won’t use the same name as an established variety. The Federal Seed Act is overseen by the USDA Agricultural Marketing Service (<https://www.ams.usda.gov/rules-regulations/fsa>).

**Plant Variety Protection Act (PVPA)** – The next federal law new seed producers and sellers in Arizona need to be aware of is 7 USC Chapter 57 – Plant Variety Protection. The Plant Variety Protection Act (<https://www.ams.usda.gov/services/plant-variety-protection>) was passed in 1970 to ensure plant variety breeders could protect their time and effort spent on breeding new varieties. The act provided protection against anyone selling, reproducing, or using the seed to create hybrids without permission from the owner of the certificate. If a variety of seed is protected by the PVPA, it cannot be grown out for seed, and those seeds sold without the owner’s permission. This includes saving seed for future plantings. The database to search for currently issued certificates is <https://apps.ams.usda.gov/CMS/default.aspx>, and searches can be completed by plant type or variety name. Before selling seed in Arizona, it is imperative that due diligence is done to ensure producers are not raising and/or selling PVPA-protected seed varieties.

**Plant and Utility Patents** – Plant patents which protect plants that reproduce asexually, and utility patents which protect genetics, methods, traits, and specialized varieties

are issued by the Patent and Trademark Office (PTO) (<https://www.uspto.gov/>). This is another protection for breeders and agriculture-based companies working in biological technologies to protect their time and investment into research and development. Patents are searchable in the online database for both plant and utility patents, which is another database that should be searched before producers and seed companies sell varieties to consumers to ensure they are not violating patents. Plant and utility patents also do not allow for seed saving from current crops or hybridized breeding without permission from patent owners.

## Understanding Heirloom Seed

Heirloom seed has a variety of definitions that depend on the seed user and their level of education on seed history. The two most accepted definitions are first, the plant variety is over 50 years old and is stabilized and consistent when grown. The second most commonly used definition of heirloom is that it has generational family or cultural significance. This can mean anything from great-grandma's favorite corn she saved since the 1960s or an okra that came from the southern United States in the 1800s and has been saved by a specific family for generations. Many consumers also equate the term heirloom with a shape of a vegetable (i.e. a beefsteak tomato) or with organic farming models.

The biggest misnomer for both new seed producers and seed companies in Arizona is the idea that heirloom seed is not and cannot be protected or patented. There are heirloom seed varieties that have been certified under both the PVPA protection and/or may have plant or utility patents on them. It is beneficial for anyone growing or selling seed they do not have protections on to ensure that even seed classified as heirloom be searched for in PVPA and PTO databases.

## Indigenous or Traditional Seed

Seed that is culturally tied to an indigenous community is a category that requires an understanding of the traditions and cultures behind the seed and plant. There are non-profits, such as [Native Seed/Search](#) in Tucson that work directly with culturally relevant and important seed.

## Permits

AZDA requires two permits for seed companies in Arizona.

**Seed Dealer** – The seed dealer “sells, distributes, processes or mixes for the use of others any agricultural, vegetable or ornamental plant seed...” as defined by ARS 3-235. They also cannot apply for a license unless they have a place of business to distribute seed and must apply for a license at every location they operate in the state. In 2022, the cost is \$50.00 per license.

**Seed Labeler** – These licenses cost \$100.00 each and are for the person or company who is doing the labeling of the seed packaging. They are the listed vendor on the package of seeds a consumer or farmer purchases.

The seed farmer is not liable for any fees to grow the seed itself if the seed is being labeled and distributed elsewhere. However, the farmer, seed labeler, and seed dealer can be the same person or company. In that case, the person or company is responsible for both licenses.

## Testing Requirements

All seed for sale in Arizona and any seed that will cross over state boundaries has testing requirements to meet Federal Seed Act standards. Required tests can include germination rate, purity, noxious weed, and seed moisture, which are then reported on the labels to legally sell the seed to consumers. Seeds must be tested by an independent laboratory. State and federal labs are also available for testing requirements on a select basis. Germination rate, purity, and noxious weed seed found must pass set federal guidelines found in the Federal Seed Act. These guidelines are dependent upon the type of seed, and in the case of noxious weeds, how many, if any, noxious weed seeds can be found during testing.

## Germination Standards

Germination standards (also known as “minimum germination standards in interstate commerce”) are set by the United States Code of Federal Regulations (CFR), and include vegetable and agricultural seeds. These regulations are found in CFR, Title 7, Subtitle B, Chapter I, Subchapter K, Part 201. Vegetable seeds are found under subsection 201.25, and agricultural seeds are found under subsection 201.8. The minimum germination standard test is done in a laboratory setting and determines how many seeds germinate at a set time under specific conditions. These conditions are plant dependent, and that information is found in 201.53 of the same CFR as the germination rate guidelines.

Figure 1. from CFR, 201.31 shows minimum germination percentages for select vegetable seeds. The seeds being tested must meet or exceed the percent listed. For example, if one variety of beet seed that was tested had a 64% germination rate, it would not meet federal regulations. If a different variety of beet seed was tested and it had 65% germination, that seed would pass the required germination rate. Keep in mind, while the CFR refers to interstate commerce, the State of Arizona also follows federal seed regulations. Seeds raised in Arizona and sold locally are required by the state to follow federal regulations.

Fig. 1. Table showing the minimum germination standards for vegetable seeds in interstate commerce.

**§ 201.31 Minimum germination standards for vegetable seeds in interstate commerce.**

The following minimum germination standards for vegetable seeds in interstate commerce, which shall be construed to include hard seed, are determined and established under section 403(c) of the Act:

	Percent
Artichoke	60
Asparagus	70
Asparagusbean	75
Bean, garden	70
Bean, lima	70
Bean, runner	75
Beet	65
Broadbean	75

## Labeling Requirements

The seed label requirements for Arizona are identified in AAC, Title 3, Article 4-402. Arizona supports the labeling requirements of the Federal Seed Act. Labels should include the name and variety (if there is a variety), seed origin location, if it is a hybrid, the germination rate, purity, if it is coated with chemicals, and a variety of other information about the seed. The seed labeler must label the seed with the company name and contact information. Additional information such as if it is heirloom, organic, or a specialty crop is marketing related and not required by law.

On this label, we can see the plant’s common name, the scientific name and the seed labeling company with their contact information. For noxious weeds, the company noted they found one seed of Giant Foxtail per pound of Crimson

Clover. Even though the amount of Giant Foxtail was within allowable levels of that weedy species, the company is still required to disclose it to the consumer. The germination rate tested by the lab was 80.00%, which falls within allowable germination levels for Crimson Clover. The lab did not find any other crop material, but there was some inert material such as soil or plant material from seed processing.

If a consumer were to purchase this bag of Crimson Clover, they would know that 93.80% of the bag was pure seed, 80.00% of all the seed in the bag should germinate if they follow bag instructions while planting, there is a slight chance of Giant Foxtail seed in the bag, and the seed was grown in Pennsylvania.

Fig. 2. An example of a seed label from the University of Delaware.

<p>T. Davis Famous Seed Company                  411 Information Way                  Moore, DE 12345 USA                  Phone: (123) 456-7890</p>	
<p>Dixie Reseeding Crimson Clover  <i>Trifolium incarnatum</i></p>	
NET WEIGHT: 25 lbs	PURE SEED: 93.80%
LOT #: IB097	OTHER CROP: 0.00%
DATE TESTED: January 2018	INERT MATTER: 6.16%
ORIGIN: PA	WEED SEED: 0.04%
	GERMINATION: 80.00%
	HARD SEED: 0.00%
RESTRICT: 1/lb Giant Foxtail	DORMANT: 13.00%



## Recommendations for New Seed Farmers and Companies

1. Understand the Federal Seed Act, the seed crop testing requirements, and the labeling requirements for seed packaging, even if you are a farmer only focusing on seed production and not seed labeling or distribution. If the seed labeler receives seed back from the lab that has poor germination, has noxious weed mixed in, or is not a desired purity, it is a reflection of the farmer growing the seed. As most seed is grown by farmers with contracts from larger seed companies, this can cause a contract breach with a failure to get paid.
2. Understand the PVPA, plant and utility patents, and how they can affect your business. This is important for farmers, seed labelers, and seed dealers as royalty payments, permission to use seed or genetics, and litigation, fines, and fees can affect budgets for small seed businesses and farmers.
3. Understand the difference between label requirements and marketing terms. The use of words like “heirloom” or “organic” are primarily marketing-related and not required by law. Heirloom is a culturally accepted type of seed and organic is a process to grow seed. The use of chemicals on the seed for seed protection or to maintain seed longevity is required on the label.
4. Read and understand the AZDA – AAC, Title 3 – Agriculture for Plant Service and Environmental Services to maintain a current understanding of state policy.
5. Ensure you have the correct permits to do business in the state.
6. Reach out to the AZDA for any questions or guidance in state policy for seed crops.

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