

Improve Yield with High Quality Seed

Fact Sheet No. 0.303

Crop Series | **Production**



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Seeds are one of the least expensive but most important factors influencing crop yield potential. Crop seeds contain all the genetic information to determine yield potential, adaptation to environmental conditions, and resistance to insect pests and disease.

One of a farmer's most critical management decisions is the selection of seed source and variety. The cost of seed stocks usually is less than 5 to 10 percent of total production costs. Yet seed stocks can affect the yield potential of a crop more than any other input factor.

Seed Quality

Seed quality is determined by many factors, principally seed purity and germination. However, many other factors, such as the variety, presence of seed-borne disease, vigor of the seed, and seed size are important when considering seed purchase.

Seed purity is determined by the amount of unwanted material present in the pure seed. Contaminants such as noxious weed seed, unwanted crop seed or inert matter not only increase production costs but also substantially reduce the quality and quantity of the harvest. If you purchase seed that has not been properly conditioned to remove unwanted weed seed, include in your decisionmaking the increased herbicide cost to control newly introduced noxious or common weeds.

Seed germination tests assess the ability of the seed to produce a healthy plant when placed under favorable environmental conditions. Germination tests are conducted for a prescribed time period under laboratory conditions that assure optimum moisture, temperature and light. Unfortunately, these conditions are seldom encountered in the field. Field emergence may be overestimated by standard germination tests.

Seed lots that have low germination also are less vigorous due to seed deterioration. As seeds deteriorate, loss of vigor precedes loss of viability, so seeds with low germination usually will be less vigorous. In seed lots with poor germination, those seeds that do germinate often produce weaker seedlings with reduced yield potential. However, some species (such as many native grasses) have inherently low germination potential and cannot be assumed to have poor vigor due to low germination.

Varietal purity indicates genetic purity of the seed. This factor is extremely important in obtaining pure stands of a specific variety. Varietal mixtures can cause uneven maturity, lower yield potential, increased susceptibility to disease and insect pests, and be less adapted to specific environmental conditions.

Varietal mixtures are difficult to detect through examination of the physical characteristics of the seed. Seed certification programs and many seed companies rely heavily on inspection of the seed production field to assure varietal purity. When choosing seed stocks, select those that are labeled by variety name, preferably certified seed. When you purchase certified seed, obtain proper documentation to prove that the seed has been certified, such as a certified seed tag or bulk sales certificate that shows the variety by name.

Seed vigor usually cannot be assessed by the consumer. Germination and seed size (in the case of cereal grains) often are good indicators of seed vigor. However, in the case of hybrid varieties, seed size or plumpness is sometimes not related to seed vigor. Research in Kansas and other states shows significant yield increases when large seeds were compared to small seeds from the same lot. These differences were accentuated when deep planting was used and point out the need to remove the small seed during seed conditioning.

Quick Facts

- Seeds are one of the least expensive but most important factors influencing yield potential.
- Seed quality is determined by germination and purity analysis.
- By law, all crop seeds must be labeled for germination percent, crop seed, weed seed and inert matter content, and the date of germination test.
- Purchase seed stock from a reputable seed dealer who has proper cleaning, handling and storage facilities.

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Seed Labeling

State and federal laws require that all agricultural seed be labeled. Labeling requirements for some flower, tree and shrub seeds may differ. If the seed has been treated a label must state the seed has been treated, the commonly accepted coined chemical name of the applied substance, and if the substance in the amount present is harmful to human or other vertebrate animals, a caution statement such as “Do not use for food, feed, or oil purposes.” Toxic substances shall be labeled with a poison symbol. Terms that must appear on the label are:

Variety name: The name of the kind or kind and variety for each agricultural seed component present in excess of 5 percent of the whole and the percentage by weight of each. If the variety is not stated, the label shall show the kind and the words “Variety Not Stated” or “VNS.” Hybrids shall be labeled as hybrids.

Lot Number: A lot number or other lot identification.

Origin: State or foreign country of origin if known; if not known, the fact shall be stated.

Pure Seed: The percentage by weight of crop seed compared to other components. The best quality seed is nearly 100 percent pure. To meet certified seed standards for small grains, seed must be more than 98 percent pure.

Other Crop Seed: The percentage by weight of any other crop seed in the test sample.

Inert Matter: The percentage by weight of sand, sticks, broken seed parts and other

foreign material in the seed. This percentage is small in high-quality seed. Higher percentages of inert material will increase the cost of the remaining pure, live seed.

Weed seed content: The percentage by weight of weed seed. State seed regulations do not allow any prohibited noxious weed seeds to be present. Any restricted noxious weed seed content must be listed on the label.

Germination: The percentage of germination, exclusive of hard or dormant seed. The percentage of dormant or hard seed if present and the calendar month and year the germination test was completed. The date of test should be within the previous 13 months on the time of sale to ensure the quality of seed and to comply with seed laws.

Labeler: The name and address of the person who labeled the seed, or who sells, offers or exposes the seed for sale within the state.

Purchasing Quality Seed Stock

High quality seed can be purchased from any reputable seed dealer who has experience in producing, conditioning (cleaning) and storing seed stocks.

During seed production, proper fertilization, adequate water, sufficient isolation (for cross pollinated crops), proper roguing of off-types, and timely harvests are all important factors. Care also must be taken to clean harvesting equipment, trucks, and storage and handling facilities to prevent contamination. During the conditioning

Colorado seed laws require that all seed labels contain the following information:

- varietal name and kind of seed;
- lot number;
- percentage by weight of pure seed;
- percentage by weight of all weed seeds;
- percentage by weight of all crop seeds;
- percentage by weight of inert matter;
- name and number per pound of restricted noxious weed seeds; and
- the date of the germination test.

and packaging process, the seed must be handled carefully to avoid contamination and damage.

Proper seed moisture at the time of packaging and seed treatment also are important considerations. Seed storage conditions must maintain the vigor and quality of the seed. Excess humidity or heat can cause severe damage to seed in a short time.

Seed dealers should have the capability and facilities to provide the conditions listed above. Their reputation as quality seed dealers usually is a good indicator of the quality of seed offered for sale. Don't hesitate to ask questions regarding the origin of the seed and appearance of the seed field. If the dealer is a neighbor, ask to see the seed production fields prior to harvest.