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Improving crop yields by planting high quality seed

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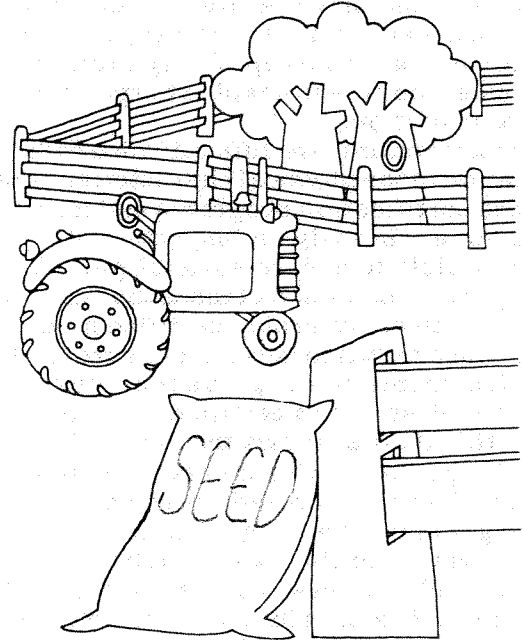
Quick Facts

Seeds represent one of the most inexpensive but important factors influencing yield potential.

Seed quality can be 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.

Seed stock should be purchased from a reputable seed dealer who has proper cleaning, handling and storage facilities.



Seeds represent one of the most inexpensive but 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 the most critical management decisions made by a farmer is the selection of seed source and variety. The cost of seed stocks usually represents less than five to ten percent of total production costs. The decision regarding 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 and the nature of the contaminant. 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. When you purchase seed stock,

consider the increased herbicide cost involved to control newly introduced noxious or common weeds if the seed you purchased has not been properly conditioned to remove unwanted weed seed.

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, and field emergence may be overestimated by standard germination tests.

Seed lots that have low germination also will be less vigorous due to seed deterioration. As seeds deteriorate, loss of vigor precedes loss of viability, so seeds with low germination will usu-

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ally be less vigorous. Hence, 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 strands 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, make sure to 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) are often 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 has shown 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.

Seed Labelling

State and federal laws require all crop seed to be labeled for germination and purity. Consumers have the right to demand this information. 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.

Terms that appear on the label are:

Pure seed: The percentage by weight of crop seed compared to other components. The best

quality seed will be 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 will be 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 pure seed that will germinate under standardized laboratory conditions.

Date of test: The date denotes when the germination test was made. This date should be within the previous 12 months of the date of sale to ensure the quality of seed, and to comply with state seed laws.

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 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.