QUALITY SEED PRODUCTION OF MAIZE

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ISOLATING A SEED PRODUCTION FIELD

Isolation of a seed crop can be done in four ways:

1. By space: Maintain a distance of at least 300 meters between the seed crop and any other maize field that has a different variety planted.
2. By time: Sow your seed crop a month earlier or later than neighboring maize fields.
3. By certified seed barriers: A barrier of genetically pure seed of the same variety may be planted within the isolation distance of the seed production field.
4. By natural barriers: Seed production plots can be established on land isolated by natural or artificial forests.
5. Distance and time isolation are the most commonly used approaches: The goal is to have no other maize variety shedding pollen nearby when the seed production field is flowering. Wind may carry pollen further than 300 meters. Thus, if there are constant strong winds in one particular direction, the distance to the next maize field should be at least 400 meters.

HOW TO SELECT A SUITABLE FIELD

Consult with your neighbors about when and where they will plant their maize, so you can sow yours in a field that is properly isolated. Apart from considering isolation, select your best field for maize seed production and manage it well, because the value of good seed is higher than the value of grain. Choose a field where no maize has been grown during the previous year to reduce the possibility that last year’s maize crop may germinate and cross-pollinate your seed maize.

ELIMINATING UNDESIRABLE PLANTS

Carefully examine your maize seed crop as it grows. You may find plants that look very different or flower much earlier or later than most other plants in the field. These plants are called off-types and they should be removed—a process known as "roguing"—before pollen shedding starts. Most farmers do not like to remove maize plants from their field, but rouging is critical to maintain varietal purity.

HARVEST AND DRYING

During harvest and drying, be careful that the seed of your maize crop does not get mixed with seed or grain from other maize varieties. Keep only the best and healthiest ears and kernels for seed, and use the rest of the harvest as grain. Your best seed comes from healthy undamaged ears that are typical for the variety. Thus, discard off-types, rotten, damaged ears, and ears where the kernels have started to germinate or are affected by insects. Place the harvested ears on a clean and dry surface, such as concrete or plastic, and dry them well in the sun. To make sure that all kernels get exposed to the sun, spread the ears in a flat layer and turn them several times. Maize seed stores best at <12% moisture content.

QUALITY CONTROL IN MAIZE SEED PRODUCTION

The production and distribution of quality maize seed requires diligent efforts both during field production and post-harvest handling. Field inspections are commonly conducted at different crop development stages to ensure quality.

1st Field Inspections

A planting inspection is commonly conducted to determine that the maize seed planted is genetically pure, of known origin, and is an appropriate variety for the area. The field should be inspected to verify that it is properly isolated and free of volunteer plants.

2nd Field Inspections

A second field inspection may be made during the vegetative growth phase. Isolation should be checked, along with the presence of disease, insect pests, or weed infestations. At this stage, off-type and diseased plants may be rogued.

3nd Field Inspections

The most important field inspections are made just prior to and during flowering. At this time the maize seed field is most susceptible to genetic contamination from wind-blown pollen coming from off-type plants within the field or other maize varieties in surrounding fields. Therefore, it is essential during the pre-flowering inspection to confirm that the maize seed field has been properly rogued and is sufficiently isolated from other maize fields. Plants that are off-type or diseased, along with harmful weeds, must be removed at this time.

4th Field Inspections

A pre-harvest or harvest inspection may be conducted as the crop reaches maturity and the seed has lost a significant portion of its moisture content. Off-type plants, such as those that are still green when most the other plants are dry, may be removed at this stage. At harvest, ears with different grain color or texture from the produced variety should be removed.

QUALITY CONTROL TESTS

Various standard tests for moisture content, germination, and physical purity can be conducted to evaluate the quality of the seed. The most common evaluation described here is the germination test, designed to determine the seed's capacity to germinate and produce normal plants when sown under appropriate conditions.

GERMINATION TEST

Germination tests may be conducted by building an open wooden box, 1 m long, 50 cm wide, and 10 cm deep .Fill the box with insect-free, loose soil. Divide it in half and plant 100 seeds in rows separated by 10 cm. Since the objective is to see how many seeds germinate, sow them one by one in a thin line about 2 cm deep. The box should be watered thoroughly and kept in a safe place away from birds and other animals. Another alternative would be to conduct the germination test in a well-prepared bed near the homestead or in a protected garden. Another option is to evaluate maize seed germination in paper towels or newspapers. With this method, 50 maize seeds are spread out in lines on moistened paper and then covered by another wetted paper .The paper is rolled and tied with a string or elastic band. The paper rolls can be placed in plastic bags or other containers and kept moist for seven days. With each of these methods, a count for normal developing seedlings is made between 7 and 10 days after sowing. A minimum of 80% germination is the suggested standard; anything below this means the seed is not of acceptable quality.

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