



Seed Production: Quality Considerations

Presented by

Simon M. Maina

Head Seed Certification & Plant Variety Protection, KEPHIS

*Short Course on Seed Quality Assurance,
Management And Control Processes - UON*

PROCEDURES FOR SEED CERTIFICATION

Seed certification activities are aimed at ensuring

that seed crop meets the set field ,factory and

Laboratory standards.

Getting started

- Registration of seed growers
- Registration of seed field
 - Grower or seed company applies for crop inspection the seed crop and pays the inspection fees



Procedure for certification contd.

- The inspector must first review the submitted application together with the supporting documents showing the proof of origin of the seed planted. This can be in form of labels
- Other information such as cropping history is checked

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Variety eligibility

- The variety to be certified must have undergone National Performance Trial (NPT) and Distinctness Uniformity and Stability tests and officially released or an advanced breeder's lines, which have potential for release.

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Variety eligibility

- The variety should have a detailed description of the morphological, physiological and other characteristics of the plant and seed that distinguish it from other varieties

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Field inspection

The main principles for checking at field inspection are:

- The previous cropping history of the field should be such that the risk of undesirable volunteer plants of the same or related species contaminating the seed crop is reduced to minimum
- The seed crop should be sufficiently isolated from other crops to reduce the risk of contamination with undesirable pollen



Field inspection

- The crop should be physically isolated to prevent mechanical admixtures at harvest
- The crop should be isolated from source of seed-borne diseases
- The seed crop should be reasonably free from weeds and other crop species especially those whose seeds may be difficult to separate from the seed crop during seed processing

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Field inspection

- The seed crop should be free from seed-borne diseases
- The seed crop should have the correct identity
- There should not be more off-type plants present than the varietal purity standards allow

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HYBRID MAIZE SEED INSPECTION PROCEDURES

- A field will be accepted or rejected for the following reasons:
 1. Varietal identification
 2. Off-type plants
 3. Isolation
 4. Pollen shedding
 5. Pest and diseases
 6. Weeds

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HYBRID MAIZE SEED INSPECTION PROCEDURES

- To complete inspection for these criteria, at least five inspections of the field must be made:
 - a) An isolation inspection (preliminary inspection)
 - b) Three pollen control inspections
 - c) A final inspection (pre-harvest inspection)



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Isolation inspection (distance)

1. Walk around the field examining boundaries to confirm that the isolation requirement is satisfied. Isolation distance is measured across a ravine but not down the bank and backup. Isolation correction may be made in the contaminating field provided the maize is removed before silk appear in the material being certified. After silking begins in the parents being certified, an isolation correction can only be made by completely destroying the improperly isolated seed crop.





Isolation inspection (distance)

2. Check the ratio of seed parent row to pollen parent row. This ratio should be such that no seed parent is more than 15 feet from pollen parent row.
3. Walk into the seed crop while examining plants to check whether they conform to the characteristics of the variety.
4. Check and confirm that border rows of pollen parent were planted. There should be eight border rows of pollen parent around the field.

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Isolation inspection (distance)

5. Check and confirm that the entire field was planted within 5 days. Fields planted at an interval of more than 5 days or a crop that is of uneven growth due to environmental factors should be separated so that fields of even crop growth are registered as a crop and kept apart from the other crops by a clear path of about 2 metres.

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Isolation by time

- Normally achieved with a minimum of 2 weeks between planting days
- The best is to however have 3 to 4 weeks difference

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Isolation by time



Pollen control inspection

- At least three inspections must be made during the period of 1 – 95% receptive silks in the seed parent.
- Ideally, first inspection will be at 1-15% receptive silks, the second inspection at 15-60% receptive silks and the third inspection at 60-95% receptive silks.

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Pollen control inspection

- It is not economically feasible to observe every plant in the field; therefore inspectors examine samples of plants. The sample size is 20 plants which is one count. The number of counts taken depends on the size of the field as follows:

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Counts

Hectares	Minimum counts
=<6	100
7 – 16	200
17 – 32	300
33 – 40	400
Over 40	500



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Sampling technique

- Establish a travel pattern before entering the field to avoid sample bias. The travel pattern should ensure that every row is crossed.
- Select a random location along the established travel pattern path to take sample count. Count 20 plants of the seed parent starting with a row next to the pollen parent after that omit one row and proceed to count 20 plants in the third. Repeat is procedure until the required total count is achieved.



Factors to check and record

- For each seed parent sample count, observe and record the following:
 1. The number of seed parent plants with receptive silks
 2. The number of seed parent plants shedding pollen
 3. The number of off-type plants in the seed parent
 4. The number of off-type plants in the seed parent shedding pollen
 5. The number of diseased plants (Head smut & common smut separately)



Factors to check and record

- And for each pollen parent sample count observe and record the following:
 1. The number of pollen parent plants shedding pollen
 2. The number of off-type plants in the pollen parent
 3. The number of off-type plants in the pollen parents shedding pollen
 4. The number of diseased plants (Head smut & common smut separately)



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Making decision on the inspection

- Total your counts for each aspect and calculate the percentage.
- *If you get after counting a field a percentage of tassels between 0.8 and 1.3% you have to recount. The average of both counts is the percentage for the field.*
- Reject the crop if:

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Making decision on the inspection

- Reject the crop if:
 - ❖ 0.1% off-types or 2% doubtful plants in male rows have shed pollen
 - ❖ 0.1% off-types or 2% doubtful plants in female rows are found at final inspection
 - ❖ Two plants per hectare of either or both of head smut or common smut are found in the seed crop

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Making decision on the inspection

- *If the figure for offtypes and doubtful plants fall between 0.8 and 1.3 and 1.8 and 2.3 respectively a second count should be taken. The average of the two counts is the percentage offtypes/doubtful plants*

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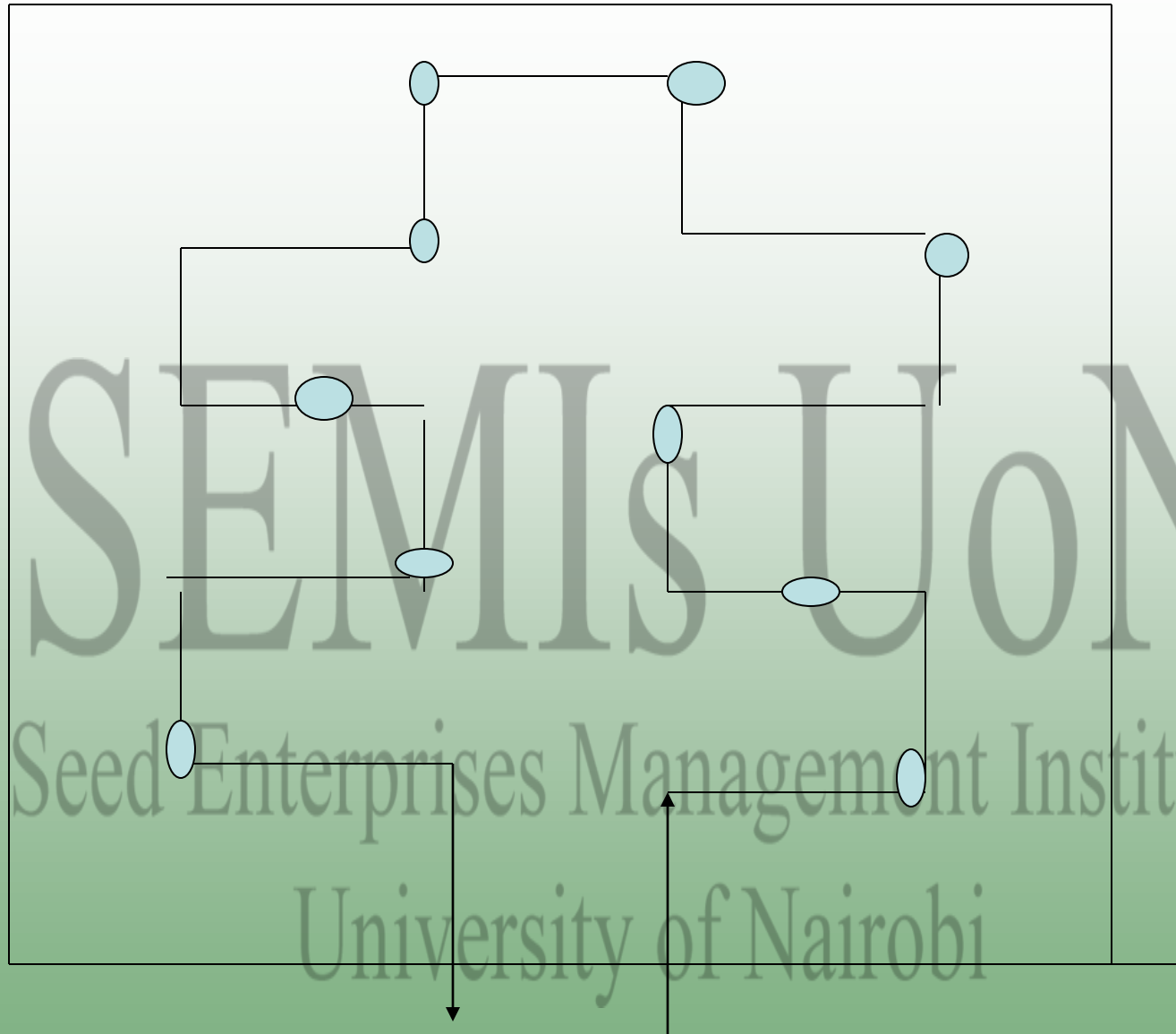
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Inspection procedures for bean seed crop

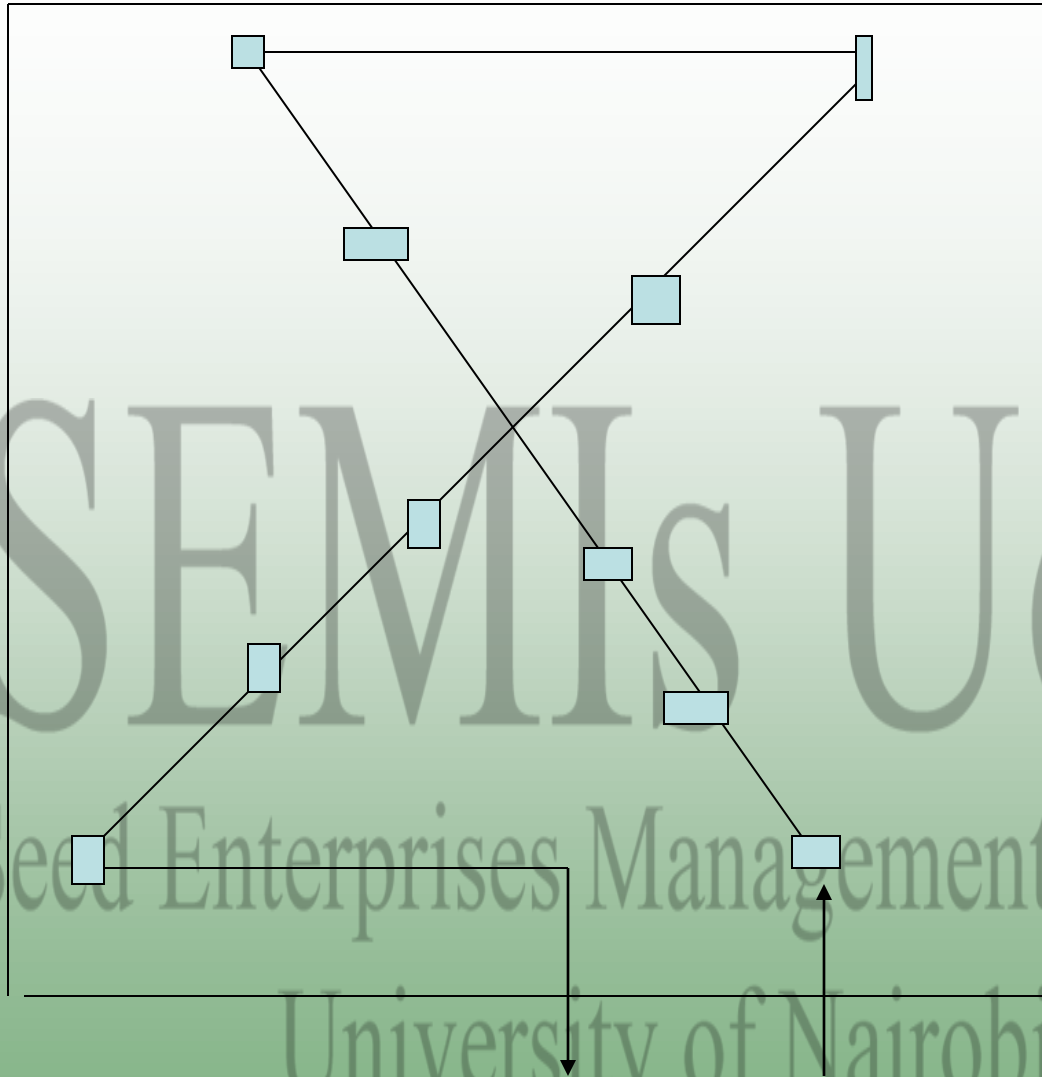


- Starting from a random position, count 100 plants along a row (equivalent to 15m or paces). As you assess the 100 plants look around for any factors which require a zero tolerance e.g. Halo blight, anthracnose etc. during final inspection.
- Examples of walking patterns are as follows:-



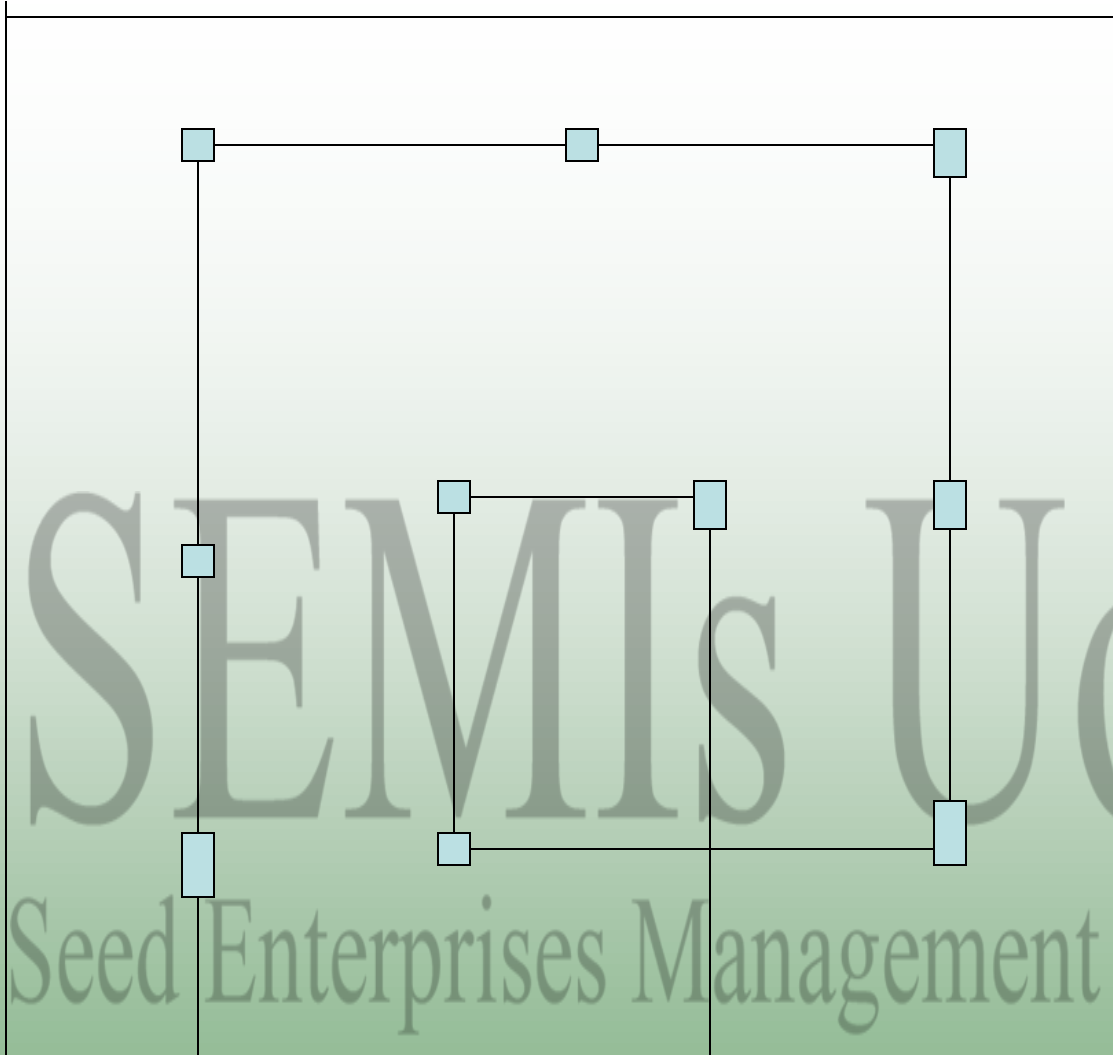
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*Observation of 75% of the
field*



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*Observation of 60-70% of
the field*



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Clockwise travel pattern

Pre-harvest inspection

- Inspect the field to ascertain that all male rows/ears have been fully removed or completely separated by a distinct and clear path before harvesting of the seed parent.

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Cob inspection

1. The first step in ear inspection is to compare the description of the cob with the characteristics of the lot being inspected.
2. Pick up an ear of corn and roll the ear so you can see all the rows. Look for kernels or ears not matching the description and or distinctly different from the rest of the lot
3. While looking at the ears note the kernel at the end of the ears and cob colour. Incorrect cob colour is a good indication of an off-type.



Cob inspection

4. Continue picking and inspecting ears until 100 ears are examined.
5. Move to another location and observe 100 ears. Continue the process until the required sample size is achieved.
6. Record all the non conforming cobs and calculate the percentage.
7. Based on the above percentage make a decision on whether to request for resorting or not





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Thank You

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