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HOW TO ACHIEVE OPTIMUM MAIZE PLANT POPULATION DENSITIES

The optimum plant population density is the lowest density which gives the optimum yield. There exists an optimum density for every variety grown under a set of agro-climatic conditions.

For pure stand maize, the recommended density is

62,500 plants/ha (seeds spaced at 0.2 m in rows of 0.8 m apart)

When sugarcane is grown in rows spaced at 1.6 m, the recommended density is

20,800 plants/ha, one row of maize being planted in alternate interrows and seeds spaced at 0.15 m

To achieve good stands and hence, optimum plant population densities, the following recommendations must strictly be adhered to :

- good seed bed preparation
- seed of good quality, with no injury or pest damage
- proper sowing
- adequate moisture at planting and subsequently.

Land preparation

Fallow sugarcane fields should be subsoiled and ploughed, and the old cane stools completely destroyed or removed, particularly if sowing is to be done mechanically. The final seed bed preparation can be accomplished with such implements as the disc harrow to break the clods, level the soil surface and create a finely textured top soil, thus allowing the seed to be in close contact with the soil particles.

In ratoon sugarcane interrows, shallow chisel-ploughing may be necessary to loosen the top soil.

Seed quality

Only certified seeds guaranteed to give at least 90% field emergence should be used, as the recommended seed rates already embody about 10% overplanting.

The results of germination tests given to growers for certified seeds are valid for 3 weeks. As maize seeds lose their viability rapidly unless stored at low temperature and proper humidity, they should not be kept by the growers under ambient conditions for more than 2 weeks before planting. Mechanical injury may result from the maladjustment of planters and the use of improper seed plates, whilst chemical injury occurs from the direct contact of seeds with fertilizers; the latter should therefore be covered with 3-4 cm of soil over which the seed is deposited.

The main pests attacking maize seedlings are insects, birds and hares.

Insect pests may be controlled by the measures recommended in MSIRI's Advisory Bulletin No. 4 (August 1984).

Birds are a serious problem as they pick seeds and uproot young seedlings.

Three measures are proposed to combat bird damage :

- 1) the soil must be kept moist for 2 weeks after sowing,
- 2) the seeds are covered with at least 4 cm of soil, and
- 3) the seed rate is slightly increased depending on the abundance of birds and history of damage in the locality.

The use of poisons, such as insecticides, should be strongly discouraged because they kill bird species indiscriminately.

Hares damage maize seedlings up to about 3 weeks after emergence. It is reported that a good deterrent is to plant coriander around the fields.

Sowing

When seed bed preparation is inadequate, it is difficult to achieve a regular seed placement when using mechanical planters, particularly if seeds have not been previously calibrated. This situation results in irregular stands and yields lower than the optimum, although the correct plant population densities are achieved.

Seeds should be sown at a depth of 4-6 cm and the soil firmly pressed.

Shallow planting leads to rooting problems and increases damage by birds whilst deep planting leads to germination failures.

Moisture

Adequate moisture is essential, particularly during the first 2 weeks after sowing, in order to promote a rapid and homogeneous germination and early growth. In the absence of rainfall, irrigation should be resorted to.