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Management of Physiological and Nutritional Disorders in Maize

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INTRODUCTION

Physiological and organic process plant disorders area unit caused by non-pathological conditions viz., poor sun lightweight, adverse climatic conditions, water-logging, phytotoxic compounds or an absence of nutrients in soil, and have an effect on the right functioning of crop i.e. metabolic activities of the plant system, those area unit necessary for correct growth and development likewise. Physiological disorders area unit distinguished from plant diseases caused by pathogens, like a Bactria, Virus or flora. Whereas the symptoms of physiological disorders could seem disease-like, they'll sometimes be prevented by sterilisation environmental conditions. However, once a plant shows symptoms of a physiological and organic process disorder it's probably that that season's growth or yield are reduced. diagnosing of the explanation for a physiological and organic process disorder (or disease) will be troublesome, however there area unit several guides that will assist with this.

Some common tips to diagnosing physiological plant disorders:

- Examine where symptoms first appear on a plant—on new leaves, old leaves or all over?
- Note the pattern of any discoloration or yellowing—is it all over, between the veins or around the edges? If only the veins are yellow deficiency is probably not involved.
- Note general patterns rather than looking at individual plants—are the symptoms distributed throughout a group of plants of the same type growing together. In the case of a deficiency all of the plants should be similarly affected, although distribution will depend on past treatments applied to the soil.
- Soil analysis, such as determining pH, can help to confirm the presence of physiological disorders.
- Consider recent conditions, such as heavy rains, dry spells, frosts, etc., may also help to determine the cause of plant disorders.

Common physiological disorder in maize:

i) Silk Jamming

Causes: Primarily caused by severe drought stress, however may result from heat and/or wetness stress or different stresses before or throughout fertilisation. Excessive plant populations and nutrient deficiency may encourage this disorder. This development is additionally common in hybrids with tight husks once cold night temperatures area unit followed by heat nights throughout silking.

Symptoms: Stresses slow silk elongation inflicting a delay or failure of silks to emerge from the ear shoot. If the delay is long enough, spore shed is also virtually or fully finished before receptive silks square measure accessible leading to nearly blank or wholly blank ears.

Importance: Significant yield losses are often practiced. This abnormality could also be common in plants with bound genetic backgrounds, however in most business maize hybrids, prevalence is triggered by environmental factors.

Management: Give the irrigation and use the drought resistance maize varieties to avoid yield loss.

ii) Genetic stripe/leaf spot/leaf flecks

Genetic disorder - genes cause abnormal morphology and colour pattern in plants.

Symptoms: Some genes alter or limit the flexibility of the maize plant to supply pigment and lead to unusual person plants or plants with white to yellow stripes or different variegations. Some leaf spots and mosaic patterns mimic symptoms caused by infectious diseases.

Importance: These genetic abnormalities area unit seen solely in maize breeding nurseries. Once seen during a business production field, they're typically scoundrel plants.

iii) Pre Germination:

Causes: Predisposition to premature germination has been shown to be genetically controlled and is additionally laid low with varied environmental factors. This development usually happens throughout seasons with low daytime, innumerable overcast weather and low heat units. Additionally, high temperatures throughout the later stages of grain growth might break embryo dormancy permitting kernels to germinate on the ear if rain happens around season. What is more, atomic number 42 deficiencies within the grain may be accountable, the severity of that is increased by serious, late dressings of gas plant food.

Symptoms: Pre-germination of kernels occurs during the latter part of grain filling and is normally only noticed at harvesting.

Importance: Pre-germination has been observed in certain seasons in KwaZulu-Natal and Mpumalanga

iv) Buggy-whipping

Buggy-whipping in corn is a common sight early in the growing season and later under certain environmental conditions.

The cause of buggy whipping is the abnormal formation of waxy leaf layers causing leaves to unfurl improperly. Agrichemicals and environment can cause this. The chloroacetamides can all cause this problem. Injury from these products occurs either before the corn emerges or very soon after emergence. Postemergence herbicides such as Banvel, Clarity, Status, or 2,4-D in the whorl can cause buggy-whipping.

v) Arrested ear development (AED), typically known as, "hollow husk" could be a rather understudied and somewhat unexplained development that has been discovered often in Delaware corn and has been found in different corn growing regions within the us. Symptoms of AED vary from little ears of corn just like those you will consume in Asian food to stout cobs typically mentioned as, "beer can" cobs Overall, ears are shorter, contain fewer kernels, and have dried tips. Husks tend to be slender and pointed at the tip as results of smaller ears. Usually silk emergence is reduced and leaves might develop a red or purple color. AED is typically related to multiple ears at a node and its incidence may be rare and sporadic at intervals a field. Many different disorders will agree AED. as an example, injury from a amount of drought stress at the incorrect stage of development may end up briefly, blunt ears just like AED.

Poor, incomplete kernel set because of poor fertilization or asynchronous spore shed and silking, insect feeding and silk clipping, additionally as variety of different connected causes disagree from AED in this the cob grows to just about its full length however kernel set is either scattered, targeted at the butt or tip finish, or is proscribed at the tip finish.

Split sweet corn kernels and that we additionally ascertained this defect in a number of our earliest planted recent market sweet corn in selection trials at the Georgetown analysis farm. Kernel cacophonic results from excess soil wet throughout the time once kernels area unit filling. The unco wet year we've had is accountable for this drawback. Split kernels create ears very vulnerable to spoilage and might render them unmarketable.

Nutritional disorder in maize

1. Nitrogen deficiency is commonly the foremost limiting consider crop production. a lot of atomic number 7 is needed than the other nutrient. Atomic number 7 may be a mobile nutrient, and intrinsically, deficiencies tend to point out informed older leaves initial, as they'll migrate to actively growing areas of the plant to support growth. These deficiencies tend to point out up as a pale inexperienced or yellowing of older leaves and can usually seem as a formed yellowing from the tip of the leaf inward.

Management— Sweet corn may be a significant element feeder, requiring just about one hundred fifty pounds of element per acre. Place out a minimum of 80-100 pounds of element per acre pre plant and apply the remaining as a side-dressing once plants square measure regarding knee high.

2. Zinc deficiency is critical as a result of metal is a vital substance for sweet corn production. Zinc deficiencies can seem as whitish marking down the leaves of a corn plant. generally the marking can seem on the outer elements of the leaves with the mid-vein remaining inexperienced. Additionally, segment length (distance between leaves on a stalk) generally are shortened in zinc-deficient plants. though some soils square measure actually metal deficient in KY, deficiency disease is most frequently ascertained in high pH scale soils (> six.5) and in terribly early planting of sweet corn, once soils square measure coldest. metal are less offered in high-er pH scale soils, and funky soil conditions typically scale back metal uptake by plants.

Management— If the soil is metallic element deficient, Zn metallic element metal are often broadcast at upto 30 pounds per acre (90 pounds of metallic element sulfate) or banded at half dozen pounds per acre (17 pounds of metallic element sulfate). Broadcast applications ought to last for many years. Once sweet corn is transplanted into plastic, 4-6 pounds of sulfate is commonly mixed into the setter water of water wheel transplanters.

3. Phosphorous deficiency generally seems as a purpling or reddening of leaves, affectingolder leaves initial. phosphoric is very important for correct kernel and ear development. Typically phosphoric deficiencies seem in soils with AN acidic (<6.0) pH. At low pH, phosphoric can bind to different parts within the soil, inflicting it to become immobile and thus out of stock to the plant.

Management— Phosphorous is enclosed in routine soil take a look ats and may be adjusted supported test results. Generally, all element is applied preplant for sweet corn production.

Other disorder in maize

4. Uneven plant stand: It is usually seen in direct seeded crops. The unevenness are often thanks to varied factors, however again and again soil compaction is that the wrongdoer.

Management— Avoid soil compaction: don't until wet soil or add it, and avoid planting in roadways. Soil tilth are often improved by increasing organic matter through cowl cropping or conservation tillage.

5. Poor ear fill: It will end in deformed, unmarketable ears. There area unit several causes of poor ear fill. Poor fertilization may result in cob tissue close to the tip of associate ear with no kernels. Severe drought stress

throughout development can even end in short, deformed ears similarly as "skips" in kernels.

Management— Plant corn at correct spacing and in blocks to make sure adequate accessible spore. Avoid drought-stressing corn from silking through ear development.

6. Drought stress, once severe, may result in poor kernel development, inadequate ear fill, and poor quality corn.

Management— Sweet corn needs vital amounts of water throughout silking and eardevelopment. Generally irrigate a minimum of one in. of water per week throughout vital times. Each drip and overhead irrigation ar effective for sweet corn production.

7. Wind damage/lodging may end up from exposure to high winds. Sweet corn will experience"root lodge" (falling over at the roots) or suffer stalk breakage (the stalk snaps).Corn that undergoes root lodging might recover and stand duplicate with marginal yield loss, notably ifthe corn is young, tho' mature plants might have a crook-necked look. Corn that has snapped at the stalk is utterly lost if the breakage is below the developing ear. Transplanted corn is a lot of prone to lodging and wind harm.

8. Frost and freeze damage will have an effect on sweet corn. Unless corn is planted terribly early, as is thecase with plasti culture sweet corn, most risk of frost injury happens in fall on late-planted crops. Though sweet corn ears area unit typically chilled for storage, a significant freeze or frost before full development will cause injury.

9. Tillering/suckering will occur in sweet corn, with "tillers" or suckers typically developing at the bottom. These tillers/suckers ar additional outstanding once corn is exposed to very favorable growing conditions or once the most stem has broken close to the bottom. The event of suckers is additionally selection dependent. Sweet corn transplanted into plastic mulch tends to develop giant numbers of suckers because of the favorable growing surroundings.

Management— although suckers were normally removed within the past, analysis has shown that they are doing not cut back yield and want not be removed. The impact of enormous numbers of suckers within the plasti culture sweet corn has not been absolutely researched.

Summary

A deficiency of any essential macro and small parts incorporates a major influence on the event of plants. Deficits of some parts end in external options in plants. These physical marks typically overlap with one {another} or area unit like those obtained as a results of an infection, and it's why they can't function an indication for correct designation Correcting the matter for the present season by foliar application of individual nutrient might not be possible, however soil preparation for next season will embrace plant food applications supported soil check recommendations and compaction alleviation or bar is best thanks to management the yield loss due the nutrient deficiency in major agricultural crop.

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