How poor fertilization opens way for stalk rot

NEWARK, Del — Lodging can greatly reduce corn yields A principal cause of lodging is stalk rot. The problem is much more serious some years than others on Delmarva, but it can be minimized with good management, says University of Delaware extension agronomist William H Mitchell

Recent research suggests that stalk rot occurs when the corn plant is forced to draw heavily on stored food in the roots and stalk in order to fill kernels in developing ears This happens when some stress such as high temperature or drought prevents the plant from manufacturing enough carbohydrates to sustain other functions and still reproduce

The developing corn plant isn't at all conservative in its growth habits, explains Mitchell Like a spendthrift, it uses everything nature–and the farmer–provides. If conditions are ideal early in the growing season, the young seedling starts out robustly, putting out a lot of lush vegetative growth it may not be able to sustain, should conditions change for the worse later on If may even start an extra ear

When the weather gets hot, if there's not enough water this large production system may run short of inputs By then the reproductive cycle has started and the plant will continue to try to support earfill by drawing on its reserves

The root system will be the first to feel the drain Next, carbohydrates stored in the stalk will be drawn off Without these to sustain them, root and stalk cells can't perform their normal functions. They start to degenerate and die.

In the process, feeder roots are lost and the stalk becomes hollow This degeneration seems to be the start of all visible stalk rot problems, says Mitchell

Several things contribute to stalk rot problems One is excessive nitrogen This stimulates top growth at the expense of root growth and reduces carbohydrate reserves

Too much water is another way to encourage excessive top growth at the expense of the corn plant's root system

Genetic makeup counts, too Add a variety without good disease resistance and you've created the perfect environment for stalk rot to occur

Research also suggests that stalk rot and weak stalks are associated with potassium deficiency in the soil Where the potassium supply is good, you're less likely to have a problem, says the agronomist This may be because potassium plays a key role in regulating the opening and closing of leaf pores (stomatoes) to permit photosynthesis.

When the plant doesn't have enough of this nutrient, its production of carbohydrates may be restricted.

Sometimes grower expectations are too high early in the season In shooting for big yields a farmer may stimulate too much early growth, unwittingly setting plants up for later stress and lodging Restrict nitrogen and increase the potassium a bit and the result should be a stronger standing corn

There's a delicate balance to maintain, when it comes to nitrogen Leave off too much and you could hurt yields.

On the other hand, there's a fairly close correlation between yield and stalk strength The heavier the yield, the greater the drain on the system and the greater the chance for the development of stalk rot

Part of the answer may be to avoid heavy applications of nitrogen at time of planting Early vegetative stimulation may actually be harmful. It may be better to sidedress later on instead, says Mitchell.

The corn plant needs adequate water to avoid moisture stress during the early stages of growth, he adds At the same time, farmers should hope they don't get too much rainfall Heavy rainstorms early in the season can contribute to the later development of stalk rot

Early planting is another way to reduce the chances for this disease Almost invariably early planting causes shorter, thicker stalk development It also permits the plant to complete pollination by early July, before heat stress begins to build up

Growers can also help reduce the incidence of lodging by selecting hybrids with good resistance to leaf diseases These are most likely to resist stalk rot

No-till corn normally stands better than conventionally tilled corn in field comparisons

Mitchell says he thinks there are two reasons for this Under no-tillage, there is often less available nitrogen because it is immobilized in organic matter, where it's held in reserve for later use.

There's also abundant evidence that potassium accumulates in the upper root zone under no-tillage and thus is more readily accessible to the plant

Much research still needs to be done on the fertility needs of the corn plant, but it may be beneficial to put on nitrogen and even potassium late in the season–even after pollination – in order to maintain balance in the system

"Balance all the way is the key to good standing corn," says Mitchell.

All kinds of stress can result in reduced carbohydrate reserves Since the corn plant doesn't have a very good self regulator but apparently responds readily to whatever stimuli it gets, it's up to the farmer to do the regulating for it, so that these stresses are avoided, or at least minimized.

Start with a hybrid that has good disease tolerance. Avoid early overwatering where possible. Don't overstimulate the plant with nitrogen Make sure it gets adequate potassium

Plant early for maximum stalk diameter and a lower center of gravity And consider switching to no-till By adopting these practices you should greatly reduce the incidence of stalk rot in your fields, Mitchell says

Tips on handling stored manure

LANCASTER — With the spring planting season just around the corner, it's easy to understand why farmers are getting anxious to empty out the manure storage.

This time-consuming job is necessary before a seedbed can be prepared, according to Ed Petrus of the Soil Conservation Service in Lancaster.

"Too many farmers, however, are storing manure with today's techniques, but spreading it by yesterday's standards", he said To get the most out of your manure, he offers the following tips·

1. Avoid excess agitation of liquid storages. The aeration can lead to nutrient loss.

2. Stay out of muddy fields with heavy equipment until the ground has dried.

3. Avoid spreading on snow or frozen ground, when the runoff and pollution potential is high.

4. Favor flat fields over steep fields, and favor fields with erosion controls (terraces, stripcropping, etc.) over other fields

5 Spread immediately before plowing and planting for best utilization.

6. Avoid spreading immediately adjacent to streams, ponds, or wells.

7. Spread based on fertilizer needs from a soil test.

8. Observe maximum spreading limits. These are based on the type of manure, consistency of the manure, productivity of the soil, and the crop to be grown

9. Do not spread on grass-legume hay early in the season.

10 Avoid continued heavy applications in the same field.

One final tip," adds Petrus. "Be neighborly. Let your neighbors know when you'll be spreading, so they can avoid outdoor activities, like barbecues or hanging out the laundry."

For further information or to check the maximum recommended rate for your soils, contact the Soil Conservation Service at 717-299-1563 or stop in at the Farm and Home Cener, Room 4, 1383 Aracadia Road, Lancaster, PA.

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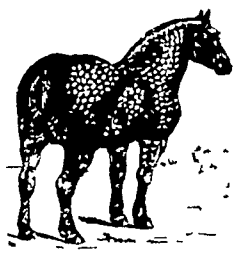

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