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TEXAS AGRILIFE EXTENSION SERVICE

Peanut Progress

Understanding The Potential Causes Behind Stand Loss

Todd Baughman—State Peanut Specialist

Jason Woodward—Extension Peanut Pathologist

Peter Dotray—Extension Weed Specialist

There have been some stand loss problems this year in peanut. Fortunately peanut is both a resilient seed and plant, therefore, stand establishment dilemmas are the exception rather than the rule. While several fungi, such as *Rhizoctonia solani*, *Pythium Rhizopus*, and *Fusarium* spp. are capable of causing seedling disease, severe stand failures are not the result solely of any seedling disease pathogen . Although in many parts of Texas it is too late to correct now is a good time to reflect on all of your planting practices that may have resulted in poor stands. Potential primal causes leading to stand loss include low quality seed, planter problems, seed bed conditions, weather, fertilizer, and/or herbicide.

Let's consider each of these individually. Poor quality seed that is of low germination or vigor or contains a high percentage of splits can lead to plant stand problems. While we have occasionally had years of lower seed quality this is generally not a concern. Even in those years stands were acceptable even if lower than desired, and only in rare instances were replanting of peanuts needed. This is why peanut seed should be inspected, tags recorded for lot numbers and germination rate. Higher germination seed should be planted first when planting conditions are generally harsher to early season peanut emergence. Unfortunately, germination rate does not always translate to seed vigor (the ability of the seed to germinate and establish under less than ideal conditions). Care should be taken to make sure that seed is handled easily (as not to create unwanted splits) and not stored under extremely hot conditions which could lower the germ.

Planter problems are often the cause of stand loss. Whether this is a new planter that is not set right or an older planter that experiences mechanical difficulties. Unexpected things can always go wrong under the stresses and hasty times of planting. Wrong settings, plates, bearings going out, vac-

uums not working properly, chains breaking, seed monitor failures, electrical complications, and all other matters of contention can lead to planter problems. This is why proper maintenance and taking time to get familiar with new equipment and making sure units are in working order (both new and old) prior to planting helps eliminate many of these concerns.

The seed bed that peanut are planted in can play a role in seedling establishment. However, the large seed of peanut can often times over come many of these difficulties. Poor seed bed conditions (too cloddy, dry, or wet) can all lead to stand loss. Seed beds that are too cloddy can often lead to poor seed to soil contact and allow the seed to dry out before the radical (seedling root) is fully established. This can also lead to possible herbicide injury. Seed beds that have inadequate moisture and allow the seed to swell and germinate but then dry out around the seed can result in seed or seedling death and poor stands. Pre-irrigation and planting deeper can often times negate these issues. While most peanuts are planted on very sandy soils, wet conditions can sometimes occur and result in poor stands. Making sure not to over irrigate fields that have a tendency to stay wet or even hold water should minimize this problem. One thing to consider is due to the large seed size and vigorous plant, peanut can be planted fairly deep. This should minimize seed bed predicaments and will also often help in assuring good inoculation of the peanut plant by rhizobia.

Weather can also result in problems with stand establishment. Fortunately the peanut plant is hard to kill and is also very vigorous in its recovery process. While wind and hail can damage peanut it is unusual to lose an entire stand to these factors. In fact, recent research has indicated that peanut can recover from severe physical damage and even with fairly low plant stands can still produce acceptable yields.

Excessive fertilizer rates can definitely result in stand reductions. In fact there have been several cases in recent years where fertilizer applied too close to the seed has resulted in significant failures to establish an adequate stand. Many fertilizers are in the form of a salt and can essentially desiccate the newly germinating seed. It is best to apply fertilizers either in a broadcast manner prior to planting or at least 2 inches to the side and below the seed. While fertilizer can be applied in-furrow less than a combined **4 total pound/acre of Nitrogen (N), Potassium/Potash (K), and Sulfur** should be applied with the seed on 40-inch rows. This does not leave much room for error in calibration or application and thus it is much safer to apply to the side of the seed rather than in-furrow. Side-dress applications should be limited to 15 pounds/acre of combined N, K, and S to insure that excessive salt is not a problem. Salt concentrations from fertilizer are enhanced on sandy soils (peanut soils) and dry planting conditions.

Herbicides applied at the wrong rate, whether by poor application techniques, improper sprayer calibration, or by improper herbicide concentration in a band,

could lead to stand problems. Herbicides applied preplant burndown, preplant incorporated, preemergence, and even postemergence could contribute to peanut stand loss. Although these occurrences are rare, it is possible for herbicides to reduce peanut emergence and even stand. Herbicides, such as Clarity (Banvel), used preplant to remove undesirable vegetation has significant soil residual activity that could reduce peanut emergence and overall stand. When significant spot spray volumes are used isolated areas where applied could result in plant stand loss. Dinitroaniline herbicides (Prowl, Sonalan, Treflan) can cause root pruning and swollen hypocotyls at high rates, but significant stand reductions are unlikely unless there is some kind of application or incorporation problem. This would require an extremely high rate to occur in the seed planting

zone. A poor or cloddy seedbed or situations where the seed furrow is not firm could lead to heavy concentrations of preplant or preemergence herbicides around the seed especially if followed by high volumes of rainfall. Valor SX injury has been noted in a few years in states such as Georgia, North Carolina, and Oklahoma. Preemergence applications must be made within 48 hours after planting and prior to peanut emergence. Applications made after plants have begun to crack or after they have emerged may result in severe injury. Splashing from heavy rains or cool conditions at or near emergence may also result in injury and even delayed maturity and yield loss. For the first time on the High Plains, similar symptomology has been observed with some of these intense rainfall events at cracking. Although significant injury (leaf loss) was noted, no stand loss has been observed to date. Dual applied preplant incorporated or preemergence to coarse soils followed by heavy rains prior to peanut emergence has been shown to slow peanut emergence and in some instances lead to stand loss. This may result in season long slow growth of the peanut plant but often times is minor enough that it is difficult to detect. Postemergence herbicide drift may result in injured or even in extreme cases plant death but this will likely not result in significant stand loss.

Finally, seedling death is often the result of infection from one or more of the seedling disease complexes. Dark lesions are often associated with unhealthy plants in fields were seedlings have been injured by other causes. For the most part, the damage caused by any fungi in these cases is only superficial; however, seed rot maybe observed in some areas of the field. Likewise, it is not uncommon to see greasy, or water-soaked “Pythium-like” symp

toms associated with stressed plants. These types of symptoms are often observed on the roots of plants impacted by herbicide/fertilizer injury, severe hail, and/or blowing sand. Although *Pythium* spp. maybe associated with a few dead plants the majority of infections will be superficial (not damaging the entire root) and not result in plant stand loss. Plant roots should be closely examined to determine whether the damage is superficial or more serious. Fungal pathogens such as *Pythium* spp. are ubiquitous and can be found in most all soils; however, disease development typically occurs following specific environmental conditions. When plants are under severe stress, these fungi can act opportunistically and compound damage. Despite the association of *Pythium* with plants early, we do not see an increased incidence of pod rot late in the season; however, close attention should be paid to fields during pod development.

If you have any questions regarding peanut production, weed control or disease management in peanut, please feel free to contact Todd Baughman, Jason Woodward, or Peter Dotray via e-mail or phone.

Todd Baughman, P.O. Box 2159, Vernon, TX 76384—940.552.9941 ext. 233, tbaughma@ag.tamu.edu

Jason Woodward, 1102 E FM 1294, Lubbock, TX 79403-6653, 806-746-6101, jewoodward@ag.tamu.edu

Peter Dotray, 1102 E FM 1294, Lubbock, TX 79403-6653, 806-746.6101, pdotray@ag.tamu.edu

AgriLIFE EXTENSION
Texas A&M System

TEXAS AGRILIFE EXTENSION SERVICE

P.O. Box 2159
11708 Highway 70 South
Vernon, TX 76385

Phone: 940-552-9941 x233
Fax: 940-553-4657
E-mail: tbaughma@ag.tamu.edu

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