gation methods were compared to a dry land (DL) control. Nitrogen treatments were tested within each irrigation block and ranged from 0 to 150 lb N/acre in 30-lb N/acre increments. Nitrogen treatments were first applied in 1982 and continued through1999. Nitrogen treatments were discontinued from 2000 through 2003, then resumed in 2004. Soil samples were taken in the early spring (2000 and 2004) prior to N-fertilization to a depth of 5.0 ft in 0.5-in increments from three replicates of each N-treatment within each irrigation block. The samples were air-dried, ground, and analyzed for nitrate-N.

The distribution of soil nitrate-N in the FI block indicated significant differences due to sample depth and N treatment in both 2000 and 2004. Soil nitrate-N was lowest in the surface 1.0 ft, and greatest soil nitrate-N was found from 1.5 to 2.5 ft, although not all differences were significant in 2000. Differences in soil nitrate-N in the FI block after suspending N treatments for four years were similar to those found in 2000, although the soil nitrate-N was generally depleted in 2004 compared to 2000. The primary zone of nitrate-N accumulation was within the argillic horizon both years. Soil nitrate-N was found to increase irregularly with increasing N rates both years.

The distribution of soil nitrate-N in the DL block was dependent on the interaction of sample depth with N treatment in 2000 and 2004. Soil nitrate-N was minimal in the three lowest N treatments (0-, 30-, and 60-lb N/acre) in 2000. The 90 lb N/acre treatment had substantial accumulations of soil nitrate-N in the surface 2.0 ft that declined with depth in 2000. Greatest amounts of soil nitrate-N were found in conjunction with the 120- and 150-lb N/acre treatments at depths of 0.5 to 2.5 ft in 2000. These depths extend approximately midway through the argillic horizon. Soil nitrate-N was minimal in the four lowest N treatments (0-, 30-, 60-, and 90-lb N/acre) in 2004. This indicates that discontinuing the N treatments for four years, in combination with continuous cropping depleted the soil of some of the excess nitrate-N. The upper 2.0 ft of 120- and 150 lb N/acre treatments were also found to be depleted of excess soil nitrate-N in 2004. Observationally, this depth coincides with the approximate depth of rooting of the cotton crop most years.

The distribution of soil nitrate-N in the HFCP irrigated block was dependent on the interaction of sample depth with N treatment in 2000 and 2004. No significant difference was observed in the soil nitrate-N of the 0- to 120-lb N/acre treatments in 2000. The 150 lb N/acre treatment produced soil nitrate-N concentrations that significantly differed with both other depths within the treatment and with other N treatments in 2000. Differences in soil nitrate-N were too small to be of practical importance in 2004. Differences in soil nitrate-N between the two sampling years were evident only in the 150 lb N/acre treatment, and indicate that the nitrate-N was depleted from the soil.

These results indicate that accumulation of nitrate-N in soils cropped to cotton was a potential environmental problem only in the DL block when N treatments exceeded crop requirements. Further, reserving N fertilization for more than four years may be required to deplete excess soil nitrate-N.

Where Do Seed Treatments Fit In Cotton Disease Management?

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In the past, in-furrow applied fungicides and nematicides were the most effective method for managing cotton seedling diseases and nematodes. However, with the advent of new seed treatment fungicides and nematicides, producers now have the option of using a complete package on the seed for their seedling disease and nematode problems. This option is attractive to producers because of the added convenience, but questions remain about the effectiveness of these treatments relative to the in-furrow applied products.

Seed treatments for managing seedling diseases have been available for many years, but treatments for managing some nematodes are a recent advance in seed treatment technology. While seed treatments may seem attractive, there are advantages and disadvantages that need to be considered before ditching your hopper boxes.

Pros of Seed Treatments

Convenience is an attractive advantage of seed treatments. Treatments are applied by seedsmen prior to sale; therefore, the need to calibrate equipment and load hopper boxes is eliminated thus saving the grower valuable time. Producers can use this time for planting or additional field operation. In addition, there is no opportunity for equipment failure or maintenance. If hopper boxes are not needed the expenses associated with these boxes can be used for other expenses. In the past, clogged delivery tubes resulted in non-treated areas in the field and increased disease and reduced yields.

Safety is another advantage of seed treatments. The amount of pesticide exposure is minimized with seed treatments. Farm labor is directly exposed to in-furrow applied fungicides and nematicides, but seed treatments are delivered to the farm already on the seed. Rates of in-furrow applied fungicides or nematicides range from a few fluid ounces to several quarts or a few ounces to several pounds, compared to a fraction of an ounce or fluid ounce needed for most seed treatments. Therefore, exposure of farm labor to fungicides and nematicides is minimized.

In addition to safety for labor, overall pesticide load in the environment is less for seed treatments relative to in-furrow applied products. In-furrow applied products are deposited on the seed and the surrounding soil, but seed treatments are confined to the seed surface making this attractive to the Environmental Protection Agency. As environmental awareness and stewardship increases, seed treatments may be the option of choice.

Cons of Seed Treatments

Efficacy of seed treatments may not be as effective as in-furrow applied products. Since seed treatments are limited to product on the seed coat, the amount of available product is usually less for seed treatments than for in-furrow applied products. This reduction in quantity could result in lower efficacy in scenarios where disease pressure is high. In fields infested with nematodes, more galls were noticed on seedlings originating from seed treated with nematicides compared to seedlings where in-furrow nematicides were used.

Residual activity of seed treatments is usually less than that provided by in-furrow applied products. This is due, in part, to the reduction in the amount of product available. The efficacy of seed treatments do not provide the extended residual activity provided by in-furrow treatments.

Cost of seed treatments can rival that of those for in-furrow applied products.

Where do seed treatments fit? While the efficacy of seed treatments may be less and cost as much as in-furrow applied products, seed treatments have a fit in the Mid-South. Using seed treatments can save producers valuable time during the early spring when the weather can be unpredictable. Seed treatments should not be used in fields where seedling disease and/or nematode problems are severe. In addition, seed treatments would not be the best option when planting during inclement weather. However, seed treatments are effective when used in fields where low to moderate disease or nematode pressure exists or during short periods (several days) of inclement weather.