

and help correct bed erosion. Liquid fertilizer can be used by knifing it into the soil, using caution to avoid root damage.

Strip mulch. The strip mulch system uses a narrow 10- to 12-inch strip of polyethylene mulch laid over a fertilizer band to help reduce fertilizer leaching. With the strip mulch system, broadcast and incorporate all of the phosphorus and micronutrients with 20 percent of the nitrogen and potassium. The remaining nitrogen and potassium should be applied in a band 2 to 3 inches deep and covered with the mulch strip in an inverted "U" fashion so that the highest point is directly over the fertilizer band. Tomatoes can then be planted in a single row to one side of the strip. No additional fertilizer is usually required although sidedressings may be needed after leaching rains. This system is less costly than the full-bed mulch system, but does not have all the advantages such as fumigant and fertilizer efficiency, weed control, and growth enhancement.

Full-Bed Mulch with Seep Irrigation. Under this system, the crop may be supplied with all of its soil requirements before the mulch is applied (Table 4). It is difficult to correct a deficiency after mulch application, although new fertilizing equipment, such as a liquid fertilizer injection wheel, should facilitate sidedressing through the mulch. Current IFAS research seeks to determine precise uses of the injection wheel. The injection wheel will also be useful for replacing fertilizer under the used plastic mulch for double-cropping systems.

A general sequence of operations for the full-bed plastic mulch system is:

1. Land preparation, including development of irrigation and drainage systems, and liming of the soil.
2. Application of "starter" fertilizer or "in-bed" mix. This should comprise only 10 to 15 percent of the total nitrogen and potassium seasonal requirement and all of the phosphorus and micronutrients. Starter fertilizer can be broadcast over the entire area prior to bedding and then incorporated. During bedding, the fertilizer will be gathered into the bed area. An alternative is to use a "modified broadcast" technique.
3. Formation of beds, incorporation of herbicide, and application of mole cricket bait.
4. Application of remaining fertilizer. The remaining 85 to 90 percent of the nitrogen and potassium is placed in narrow bands 9 to 10 inches to each side of the plant row in furrows 1 to 1½ inches deep. Placing the fertilizer in the grooves allows it to be in contact with moist soil. Bed presses are

modified to provide the groove. Only water-soluble nutrient sources should be used for the banded fertilizer. A mixture of potassium nitrate, calcium nitrate, and ammonium nitrate has proven successful. Try to keep the level of ammoniacal nitrogen at no more than 30 to 50 percent to ensure ample amounts of nitrate-nitrogen available to plants.

5. Fumigation, pressing of beds, and mulching. This should be done in one operation, if possible. Be sure that the mulching machine seals the edges of the mulch adequately with soil to prevent fumigant escape.

There is equipment that will do most of the operations in steps 4 and 5 above in one pass over the field.

Water management with the seep irrigation system is critical to successful crops. Maintain the water level at 15 to 18 inches below bed surface. Do not fluctuate the water table since this leads to increased leaching losses of plant nutrients. Additional information on fertilizer and water management for full-bed, plastic mulch, seep-irrigated tomatoes is available (3).

Mulched Culture with Overhead Irrigation. For the sandy soils, maximum production has been attained by broadcasting 100 percent of the fertilizer in a swath 3 to 4 feet wide and incorporating prior to bedding and mulching (8). Where soluble salt injury has been a problem, a combination of broadcast and banding should be used. Incorporate 30 percent to 40 percent of the nitrogen and potassium and 100 percent of the phosphorus and micronutrients into the bed by rototilling. The remaining nitrogen and potassium is applied in bands 6 to 8 inches to the sides of the seed or transplant and 2 to 4 inches deep to place it in contact with moist soil. Normally, on sandy soils, enough irrigation water enters the mulched beds through plant holes so that perforation of plastic is not required. Perforation is needed on soils such as Rockdale where lateral movement of water through the soil is negligible. On Rockdale soil, a small amount of superphosphate (25 pounds phosphorus per acre) should be applied in the drill area to support germinating seedlings or transplants.

Mulched Production with Drip Irrigation. Where drip irrigation is used, drip tape or tubes should be laid 2 to 3 inches below the bed soil surface prior to mulching. This placement helps protect tubes from mice and cricket damage. The drip system is an excellent tool with which to fertilize the crop.