

## How to Grow Pumpkins with Zone Tillage

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I have been growing crops with zone tillage since 1997. I started with corn and soybeans and gradually added other crops as I became an experienced zone tiller. I added pumpkins in 1999 and now grow all the crops on my farm with either zone tillage or no tillage. The reasons for learning about, and switching to, zone tillage were a long-time concern for soil health and a need to reduce the number of field operations on my farm. Added benefits for pumpkins were better weed control and cleaner pumpkins at harvest.

A zone tillage system begins with an understanding of four principles:

1. Till only to plant the crop, not to grow weeds.
2. Fertilize only the crop, not the weeds.
3. Keep soil covered at all times-plant cover crops between harvested crops.
4. Don't burn up the organic matter left from harvested and cover crops by plowing it under the soil-**Leave it alone on top.**

If you don't embrace these principles, and insist on some type of full-width tillage before planting your crop, zone tillage is not for you.

Zone till pumpkins begin with planting rye in the fall, in September or early October, 1-2 bu./acre to get a good thick stand. The taller you can let the rye grow in the spring before killing it, the more mulch you will have to keep the pumpkins clean. But don't wait until it gets too tall to spray or roll. I spray glyphosate by the time the rye is 3-feet high so I can raise the spray boom over it. You can also kill it mechanically. Steve Groph uses a modified Buffalo rolling stalk chopper, and the Rodale Institute has developed a large tractor-mounted roller with cutting knives around the circumference in the shape of a V.

About 10-14 days before planting, use a strip tillage tool with a long narrow shank to till the row. I use an Unverfurth Zone-Builder, but there are several others on the market now. The Zone-Builder has a tillage shank that is only  $\frac{3}{4}$ -inch wide and that will go as deep as 18-20 inches. Probe the soil to find out how deep the compacted layers are (plow pans, clay layers, etc.). Then run the shank just below that depth to make a channel through the compacted layer for crop roots to follow toward nutrients and moisture later in the season. There is a single disk ahead of the tillage shank to cut through the killed rye so it doesn't make any difference if the rye has fallen with the row or sideways. A pair of disk coulters is mounted behind the tillage shank to hill soil into a ridge about 4-6 inches wide and 2-4 inches high. This ridge will settle by planting time, and the rye will form a mat between the rows to hold moisture and suppress weeds. You only till a narrow row for the crop with this machine, not the row middle that grows nothing but weeds.

To plant the tilled strip, I use an Unverfurth Zone-Till cart and pull a conventional John Deere planter behind it. The cart is a big fertilizer tank with a toolbar under the hitch that has three coulters mounted per row. These coulters till only the row to be planted, about 4 inches deep. The two outside coulters are set about 3.5 inches to each side of the center of the row and include a spring-type injector for liquid fertilizer. The fertilizer nozzle is set about 3 inches deep, and all fertilizer for the pumpkin crop is injected at planting, one-half on each side of the row. That way I'm not spreading dry fertilizer across the whole row and fertilizing the weeds that come up in the row middles. I use all liquid fertilizer because it is easy to handle and store, and I can blend two or more kinds together right in the tank to get whatever analysis I need.

The planter is towed behind the cart and has several modifications to improve its performance for zone tillage. The original John Deere gauge wheel tires have been replaced with reduced-inner-diameter gauge wheel tires from a Case-IH planter to prevent sidewall compaction in the row. Keeton seed firmers have been added to all rows for more uniformity of stand, and Martin spading closing wheels and drag chains have replaced the original John Deere closing wheels to reduce compaction over the seed. Finally I removed  $\frac{3}{4}$  of the fingers in the John Deere finger pickup meter so I could plant pumpkins to final stand without having to thin them with hand hoeing. The greatest seed spacing with the original meters was 16 inches. Now the planter will singulate individual pumpkin seeds and space them 64 inches apart in the row.

I have a spray tank with a 12-volt electric pump on my planter and flood nozzles mounted across the back over every row. I spray glyphosate and pre-emergence herbicides as I plant for weed control. I come back in 30 days with a reduced rate of a broadleaf herbicide and a grass herbicide to clean up any escapes.

Over the years of zone tillage on my farm, I have noticed a gradual weed shift toward perennial weeds and fewer annual weeds. Annual weeds often germinate after tillage, and by reducing tillage to only a narrow band in the row and not cultivating the row middles, fewer annual weeds emerge. Perennial weeds are often killed with tillage, so over time they begin to build up with zone tillage. But they are easily controlled in the fall. The rye cover crop at planting also helps control weeds, the thicker the rye the fewer the weeds. And the mulch remaining between the rows reduces weed germination and holds soil moisture for the crop to use later in the summer.

One of the biggest advantages for zone till pumpkins is that they are usually cleaner at picking. Soil does not splash up on the pumpkin as easily from hard rains. The only real difficulty for beginners with zone till pumpkins is having a planter that will successfully plant through the thick mulch and learning how to do it. Start on a small acreage until you are confident about planting into killed rye. Then get on with it.