



## DETERMINING THE MAINSTEM NODE NUMBER FOR COTTON

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To systematically monitor a young crop effectively, it is important to understand the fundamentals about counting and identifying nodes on the plant. A mainstem node is simply the point on the plant stalk where a joint with a side branch (either vegetative or fruiting branch) is formed. The basic point of reference for counting nodes on a cotton plant are the cotyledonary nodes. The cotyledonary leaves are the first two leaves to appear as the plant emerges through the soil after planting, and are actually the former halves of the seed itself. Therefore, the cotyledons form the first nodes on the mainstem of the plant and they are the only nodes which are directly opposite one another, or parallel. When counting mainstem nodes we use the cotyledon nodes as 0, then counting subsequent nodes up the mainstem toward the terminal of the plant.

For example in Figure 1, a general diagram of a young cotton plant is shown with the cotyledonary nodes at the base of the plant, the first five nodes being vegetative branches, and the first fruiting branch is shown at node 6. Usually, we include the terminal node of the plant if the first leaf attached to it (a subtending leaf) is one inch in diameter or greater (about the size of a quarter). If that were the case in the example shown in Figure 1, then we would count that plant as having a total of 8 mainstem nodes.

Non-stressed cotton plants in Arizona will produce a new mainstem node with approximately every additional 100 heat units accumulated since planting (HUAP). However, we can track mainstem node production more accurately following a simple mathematical relationship, where: **Nodes = 3.8 + 0.008 (HUAP)**. According to this relationship, we would expect the following mainstem nodes at various stages of growth or HUAP: 9 nodes @ 700 HUAP; 13 nodes @ 1200 HUAP; 20 nodes @ 2,000 HUAP; and 24 nodes @ 2500 HUAP. So the number of nodes on the plant can serve as a good indicator of plant age. By reviewing a number of plants in a field, similar to the one diagrammed in Figure 1, we could see that generally the crop should have about 600 HUAP and that the first fruiting branch is commonly occurring at node 6, with squares continuing to form on subsequent fruiting branches.

It is important for us to also note whether the squares are being retained on the plant and not aborted. Causes of square abortion can include insect damage, dry conditions (plant desiccation), wind or sand damage, etc.. Excessive square loss early in the season can stimulate vegetative growth and create a plant that is difficult to control for quite some time. Vegetative growth tendencies will usually not affect the rate of node development, but the length of the internodes will commonly increase. This relationship offers the foundation for the development of the high-toned ratio (HNR) as a measure of the level of vegetative growth or vigor of a crop.

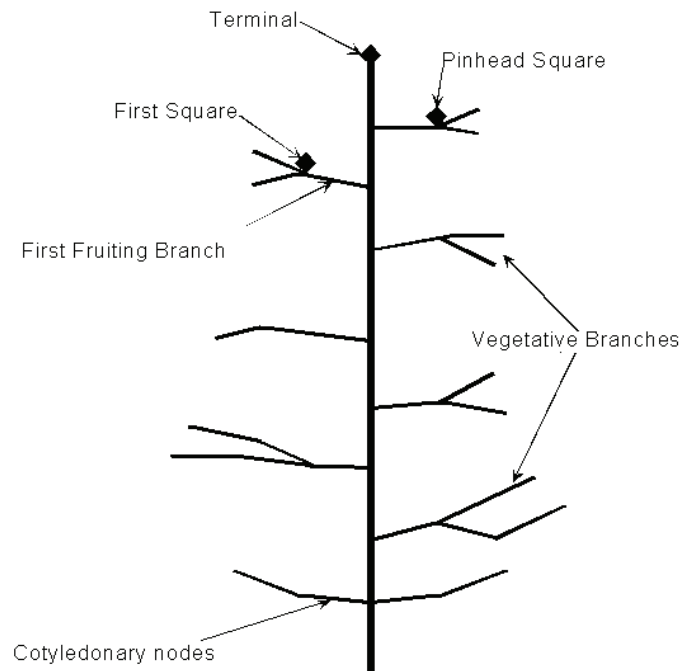


Figure 1. General early season cotton plant diagram



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