

How Thick Should I Plant My Corn Silage in 2017?

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Farmers are searching for ways to lower corn production costs for the 2017 season. Many management practices can be adjusted during “low-margin” years. However, farmers need to know the input level that provides maximum yield versus the input level required for economic optimum. The input level for economic optimum is lower than the level providing maximum yield.

Corn seed costs have increased 5x over the last 20 years (USDA-ERS, 2017). Yet, farmers have increased harvested plant populations by 306 plants/ac every year, from 21,000 plants/ac in 1982 to over 30,000 in 2014 (USDA-NASS, 2017). A number of factors affect plant population producing maximum yield (e.g., hybrid, farm, soil type and texture, environment, management style). Factors affecting economic optimum include seed and grain (or silage) price. A typical bag of seed costs \$350/80,000 kernels or \$4.38/1,000 kernels.

From 2007 to 2016, staff at the University of Wisconsin investigated corn yield and quality response to plant population. Plant population producing maximum grain yield during this time was 39,000 plant/ac. Economic optimum plant population for grain yield was 34,000 plants/ac. Plant population producing maximum forage yield was 48,000 plants/ac, while maximum milk per ton was 18,000 plants/ac, and maximum milk per acre was 45,000 plants/ac. All of these maximum yield and economic optimum plant populations are higher than the average current commercial plant populations of 30,000 plants/ac.

Average plant density for maximum yield for one farm and one soil series is quite variable. For example, at Arlington on a Plano silt loam, the maximum yield plant density for grain varied from 29,000 plants/ac in 2011 to 43,000 plants/ac in 2013. For forage yield, maximum yield plant density ranged from 35,000 to 50,000 plants/ac. Long-term data across 10 locations indicate maximum yield plant density ranges from 30,000 to 40,000 plants/ac. Many researchers have documented hybrid X plant density interactions for maximum yield plant density (Assefa et al., 2016). Year, hybrid, and location play significant roles in determining how thick corn should be planted to maximize forage yield.

So how should you approach this decision in 2017? One way might be to assume maximum yield and economic optimum plant densities increase over time. For any field, choose what you think is the appropriate plant density and plant most of the field to that target density. For one round, increase plant density 10%. For example, if you feel economic optimum for a field is 30,000 plants/ac, then for one round increase it to 33,000 plants/ac. You should be able to pick up any plant density effects on a yield map during fall harvest.

USDA-ERS. 2017. Commodity Costs and Returns [Online]. Available at <https://www.ers.usda.gov/data-products/commodity-costs-and-returns/> [accessed 2017Feb19, verified 2017Feb19].

USDA-NASS. 2017. Quick Stats [Online]. Available at <https://quickstats.nass.usda.gov/> [accessed 2017Feb19; verified 2017Feb19].

Assefa, Y., P.V. Vara Prasad, P. Carter, M. Hinds, G. Bhalla, R. Schon, M. Jeschke, S. Paszkiewicz, and I.A. Ciampitti. 2016. Yield Responses to Planting Density for US Modern Corn Hybrids: A Synthesis-Analysis. *Crop Science* 56:2802-2817.