

CORN EMERGENCE EVALUATION

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NEED FOR EVALUATION

Seedling vigor and days to maturity start when seeds are placed in soil capable of inducing germination. From there it is a foot race for plants to utilize available nutrients, sunlight, and moisture in fields that will be harvested collectively. This evaluation asked the question, will seeds that germinate sooner produce plants that will yield more?

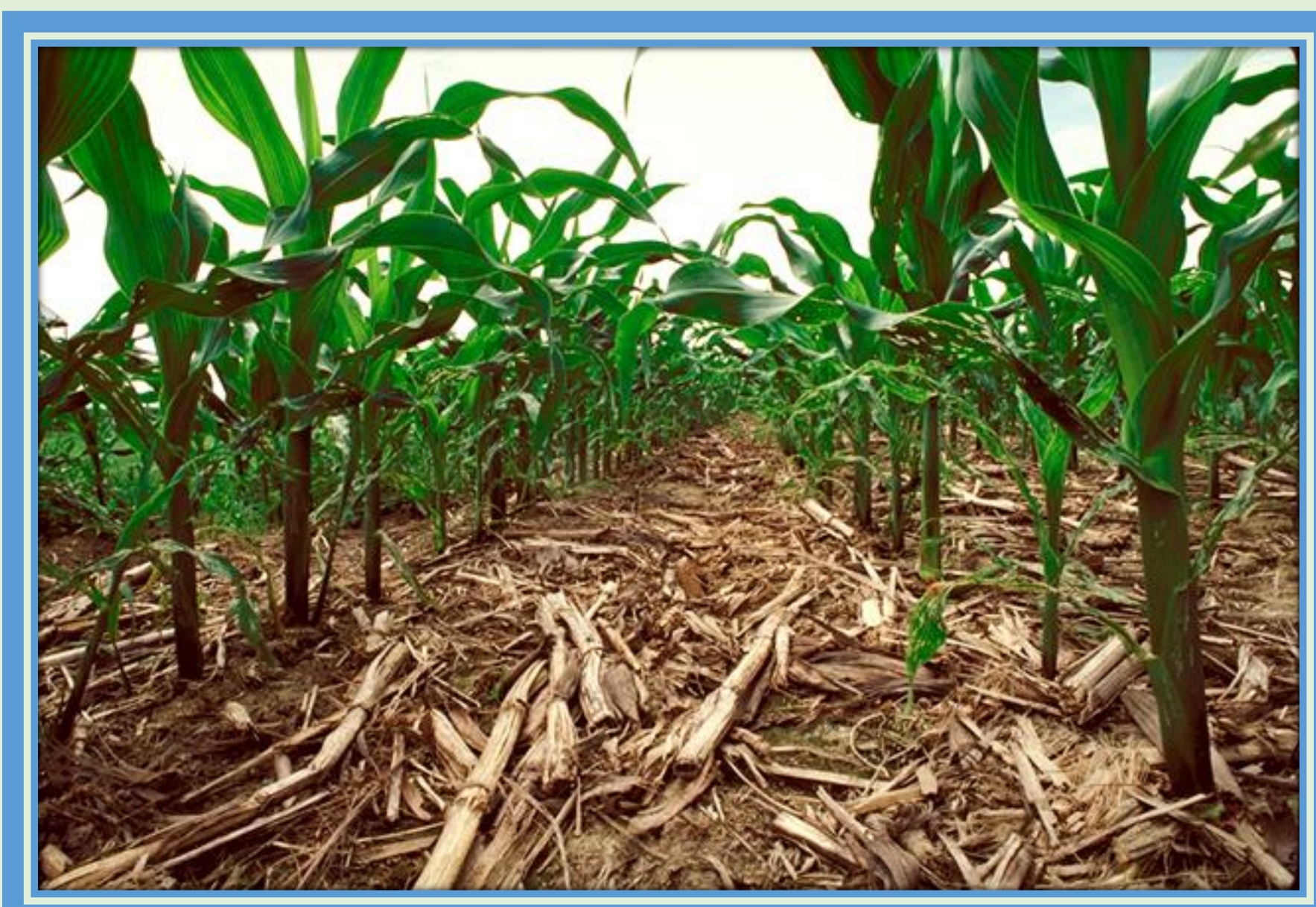


Figure 1: Uniform Corn Emergence

TEST DESIGN AND PROCEEDURE

Three years of tests from 2016 to 2018 were conducted in Chesapeake, Virginia with support from check-off funds provided by the Virginia Corn Board. Seven separate test plots were set up at separate farms. At each site, a forty foot section of planted row was flagged each day between 11:00 a.m. and 1:00 p.m. for the next twelve days. Beginning on the first day of emergence (defined as coleoptile visible above the soil line) and each day thereafter, a colored flag was placed beside each emerging seedling. A red flag for 1st day, a blue flag for 2nd day, and a yellow flag for seedlings on or after the 3rd day.



← **Figure 2:** In 2018 at Heath Cutrell Farm, soil temperatures were cool and wet. Germination was slow and spread out over a week. Result was 18 plants emerged on day 1 (red flags) and 30 plants emerged on day 2 (blue flags). After day 3, 31 plants emerged and were marked with yellow flags.



Figure 3: By contrast, in 2016 at Heath → Cutrell's Farm, soil temperatures were warm and moist, prompting quick 100% germination by day 2. Note only red and blue flags.



← **Figure 4:** When corn reached maturity, ears were hand harvested, segregated by color and shelled with an old-time crank style single ear sheller.

Figure 5: Corn from all red flags, → blue flags, and yellow flags were counted and weighed. Average weights per ear were calculated for each grouping.



RESULTS

Figure 6: Visual appearance in 2016 shows larger ears for day 1 corn (Red Flag) vs. day 2 (Blue Flag) vs. day 3 (Yellow Flag). Visual observance also showed more ear uniformity and ear size for day 1 seedlings vs. subsequent seedlings.



At these separate farms using different production practices, varieties, equipment, soils and dates of planting, three year results showed corn seedlings emerging on day 1 had more weight per ear than corn emerging on day 2. Corn emerging on day 2 had more weight than corn emerging after day 3. See table below.

Day/Date of Emergence	# of Plants	% of Plants	Lbs. Shelled Corn Total	Av. Wt. lbs./ Harvestable Ear
Day 1	209	50.4%	86.76	.4151
Day 2	126	30.4%	50.76	.4029
Day 3 and after	78	18.8%	30.62	.3926
Barren Plants	2	0.4%	0	
TOTALS	415	100%	168.14	

Calculating yield advantage based on final plant population of 38,000 plants/acre showed 8.3 more bu./acre for corn emerging on day 1 vs. day 2. A yield advantage of 7.0 bu./acre for corn emerging on day 2 vs. day 3. A yield advantage of 15.3 bu./acre for corn emerging on day 1 vs. day 3 and after. This was calculated by multiplying 38,000 ears times average wt./harvestable ear for each of the emergence dates. See table below.

Day/Date of Emergence	Average Wt. lbs. / Harvestable Ear	Plant population Ears/acre	Lbs./acre	Bu/acre	Yield Advantage
Day 1	.4151	38,000	15,773.8	281.7	8.3 vs. Day 2
Day 2	.4029	38,000	15,310.2	273.4	7.0 vs. Day 3
Day 3	.3926	38,000	14,918.8	266.4	

COOPERATING FARMS

Year	Row Spacing	Plant Population	Variety	
2016	Frank Williams Farm	20 Inches	30,000 plants/acre	Pioneer P1197
	Heath Cutrell Farm	30 Inches	38,000 plants/acre	Dekalb 62-08
2017	Frank Williams Farm	20 Inches	30,000 plants/acre	Pioneer P0604
	Heath Cutrell Farm	30 Inches	38,000 plants/acre	Dekalb 62-08
2018	Frank Williams Farm	20 Inches	35,000 plants/acre	Pioneer P1197
	Heath Cutrell Farm	30 Inches	38,000 plants/acre	Dekalb 62-08
	Marc McPherson Farm	15 Inches	38,500 plants/acre	Dekalb 62-08