

MSU AGRICULTURE INNOVATION DAY

FOCUS ON PRECISION

TECHNOLOGY THAT PAYS

Planter Calibration: Seed Placement Pays

Cost and Yield Improvements Needed to Cash Flow

**New Compared to Used 16 Row No-Till vs. Conventional
Planter with and without Update to Electric Drive, Row Based
Downforce and Smartbox Insecticide Technology**

	Total Cost	Cash Flow Cost/Ac	Actual Cost (Int,Dep)	Actual Cost (Int,Dep) per Acre	Bushel/acre to pay for equipment and technology
New Planter	\$230,000	(\$55.16)	\$25,300.00	\$31.63	8.4
Used No-Till Planter – Upgraded	\$102,901	(\$24.68)	\$11,319.11	\$14.15	3.8
Used No-Till Planter	\$48,000	(\$11.51)	\$5,280.00	\$6.60	1.8
Used Conv. Planter – upgraded	\$86,401	(\$20.72)	\$9,504.11	\$11.88	3.2
Used Conv. Planter	\$28,500	(\$6.83)	\$3,135.00	\$3.92	1.0
Paid For Planter – retro	\$57,901	(\$13.89)	\$6,369.11	\$7.96	2.1

Assumptions: 16 row planter, 6 year term, 6% interest, 5% depreciation

Projection is based on 800 acres of corn production valued at \$3.75 a bushel. Cost of controller system is included (around \$6000), which may not be needed depending upon what is in tractor).



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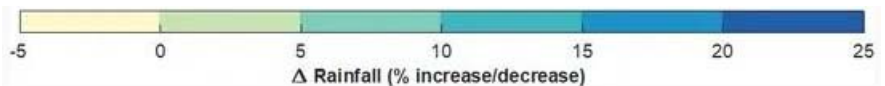
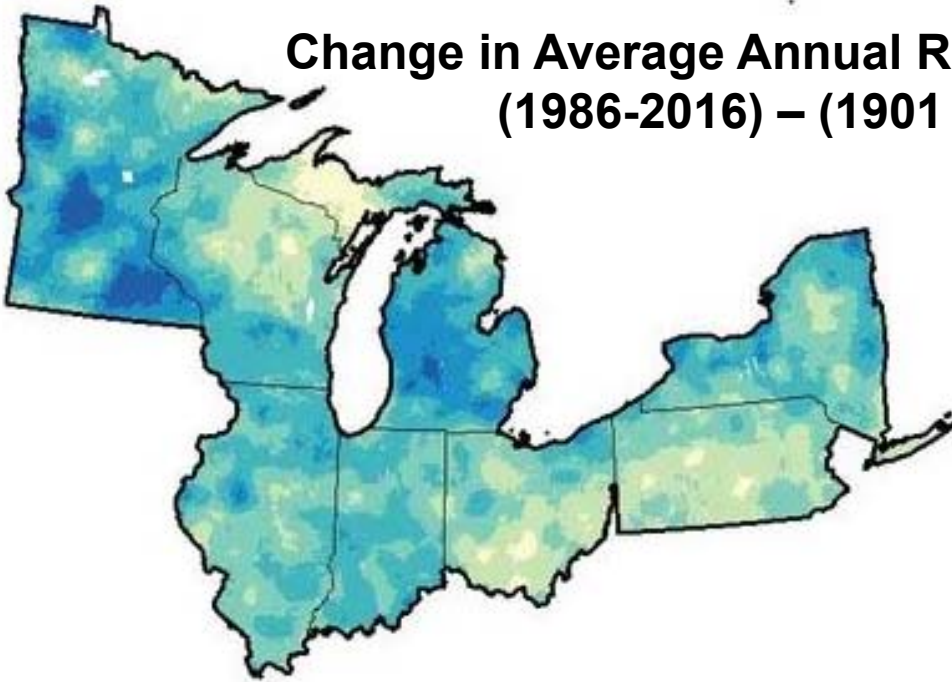
Planter Calibration: Seed Placement Pays

Weather's Impact on Seed Placement and Stand

Michigan is getting wetter:

Increasing Rainfall Puts Days Available for Planting at Risk

Change in Average Annual Rainfall: nClimDiv
(1986-2016) – (1901 – 1960)



The Great Lakes region saw a significant increase in rainfall over the past 30 years when compared to the first six decades of the 1900s. (Photo: NOAA/NCEI)



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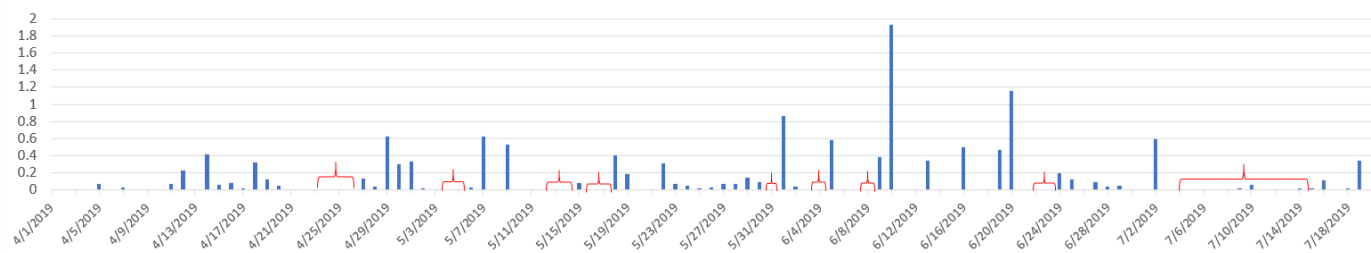
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Weather's Impact on Seed Placement and Stand

2019 Precipitation at MSU: Anatomy of Planting Delays

MSU Campus Rainfall (2019 Growing Season)



Field Site: 1st 12 Rows were planted on June 19 following a brief shower that added 0.07 of an inch of precipitation to already moist soils.



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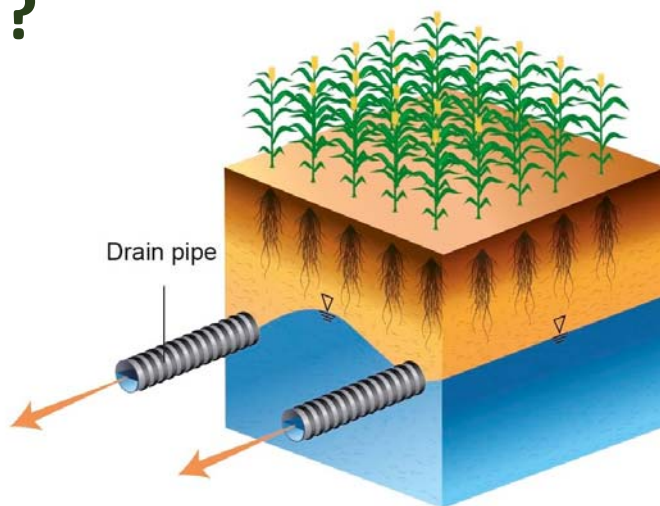


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Drainage Tile Spacing: Are Your Fields Up To The Task for Increasingly Wet Springs?



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Workable Solutions:

Using Technology to Extend Hours of Operation: Autosteer Can Help to Reduce Operator Fatigue, Allowing for Planting More Hours Per Day When The Conditions are Good.



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Impact of Starter Fertilizer, especially in poor planting conditions



Image courtesy of Iowa State University

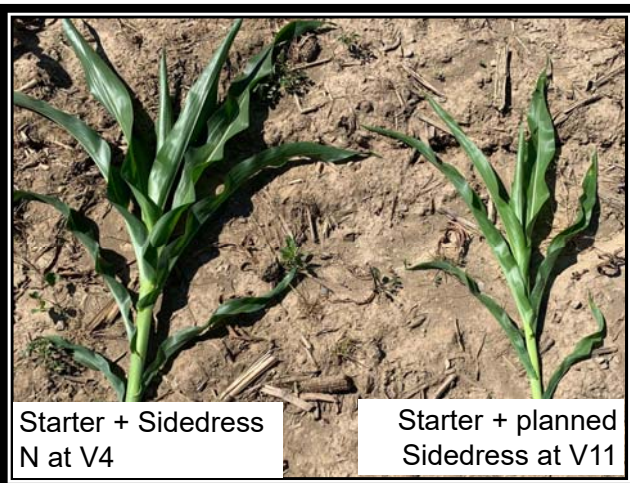


Image courtesy of Dr. Kurt Steinke, MSU Fertility Specialist

Workable Solutions:

Early Season Nitrogen is Important

Consider Using Starter Fertilizer/Early Sidedress Nitrogen to Improve Growth In Tough Planting/Growing Conditions



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Workable Solutions:

Upgrading to a Larger Planter

Planter size can make a difference in terms of acres that can be planted per workable hour when conditions are good.



Higher Speed Planting

- Often good stands can be achieved at 7-8 miles per hour vs 4-5 mph for older style planters.
- 16 row planters can plant 22-25 acres an hour under good conditions.
- 24 row planters can achieve around 35 acres per hour under good conditions.



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These numbers are for larger field where minimum turns are required.



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Steps to Improve Yield

Soil conditions at planting can vary widely. Making sure your planter is adjusted and operating correctly can go a long way to improving stand uniformity.

Be sure your planter is closing the seed trench correctly and that you are not moving too fast for the current conditions.

Too much soil moisture can cause challenges with closing the seed trench or cause challenges with sidewall smearing, which can greatly restrict root growth.

Planting in dry conditions, or too deep, can create uneven emergence. Excavating seeds is the best way to check that the depth of planting is staying uniform between units.



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Singulation can be impacted by:

- Improper vacuum setting for seed weight
- Wear effecting vacuum at the seed unit
- Seed plate wear
- Seed drive train challenges: rusted chains, worn bearings, seed tube wear, etc.

Take Time for to Test Planter Performance

Driveway Test:

- Set the planting depth to zero
- Take pressure off the closing wheels
- Run a distance and check for seed count and spacing

Field Test: Plant a short distance and expose seeds in the row looking at:

- Uniformity of depth
- closure of seed slot
- sidewall smearing
- excessive packing



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Steps to Improve Yield

Value of No-Till Production in Reducing Planting Delays

No-Till Production helped producers in two different ways in 2019

1. Growers were able to take advantage of the early field work window to get crops in the ground instead of working the soil..
 - Growers must balance early planting with cold soil/frost risk and understand that No-Till fields stay colder longer
2. No-Till producers also enjoyed the drainage benefits of improved soil structure, which allowed many of fields to be trafficked earlier than conventionally tilled ground.



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Ensure even stands, to reduce field yield losses.

Perfect Stand



In Row Variability

$\frac{3}{4}$ of normal – 1% equals 0.2 b/a yield loss



Skips - 1% skips in a stand equate to ~1.3 b/a yield



Doubles – modest yield increase to a point



Late emergence – second largest yield loss



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