

# **Seed Metering Performance of Different Peanut Seed Meters at Varying Seeding Rates and Planting Speeds**

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# Planter Technology Trends

- ❑ Timely and uniform emergence is important for optimal stand establishment
- ❑ Increased interest in improving planter performance (i.e. seed metering and placement accuracy)
- ❑ Numerous advanced planting technology options available today to utilize.





# Peanut Planting

- Peanut seeding rates are considerably higher than other crops (corn and cotton)
- Planting speed is normally slower (3.0 – 3.5 mph)
- Until recently, most of the planting technology advancements have been focused primarily towards other crops (primarily corn)



# Peanut Planters



***Assess seed metering performance  
(population & singulation) for different  
peanut seed meters***





# Peanut Seed Meters

## John Deere

- *staggered 56-cell seed plate*
- *ground driven*
- *vacuum : 12-14*



## Monosem

- *singulated 48-cell seed plate*
- *ground driven*
- *doubles eliminator*
- *vacuum : 20-25*



## Precision Planting

- *singulated 32-cell seed plate*
- *electronically driven*
- *doubles eliminator & ejector*
- *vacuum : 20-30*



# Metering Performance Testing

- **Three Peanut Seed meters:**
  - John Deere
  - Monosem
  - Precision Planting
- **Six Seeding Rates (seeds/ft):**
  - 3, 4, 5, 6, 7 & 8
- **Seven Planting Speeds (mph):**
  - 2.0, 2.5, 3.0, 3.5, 4.0, 4.5 & 5.0





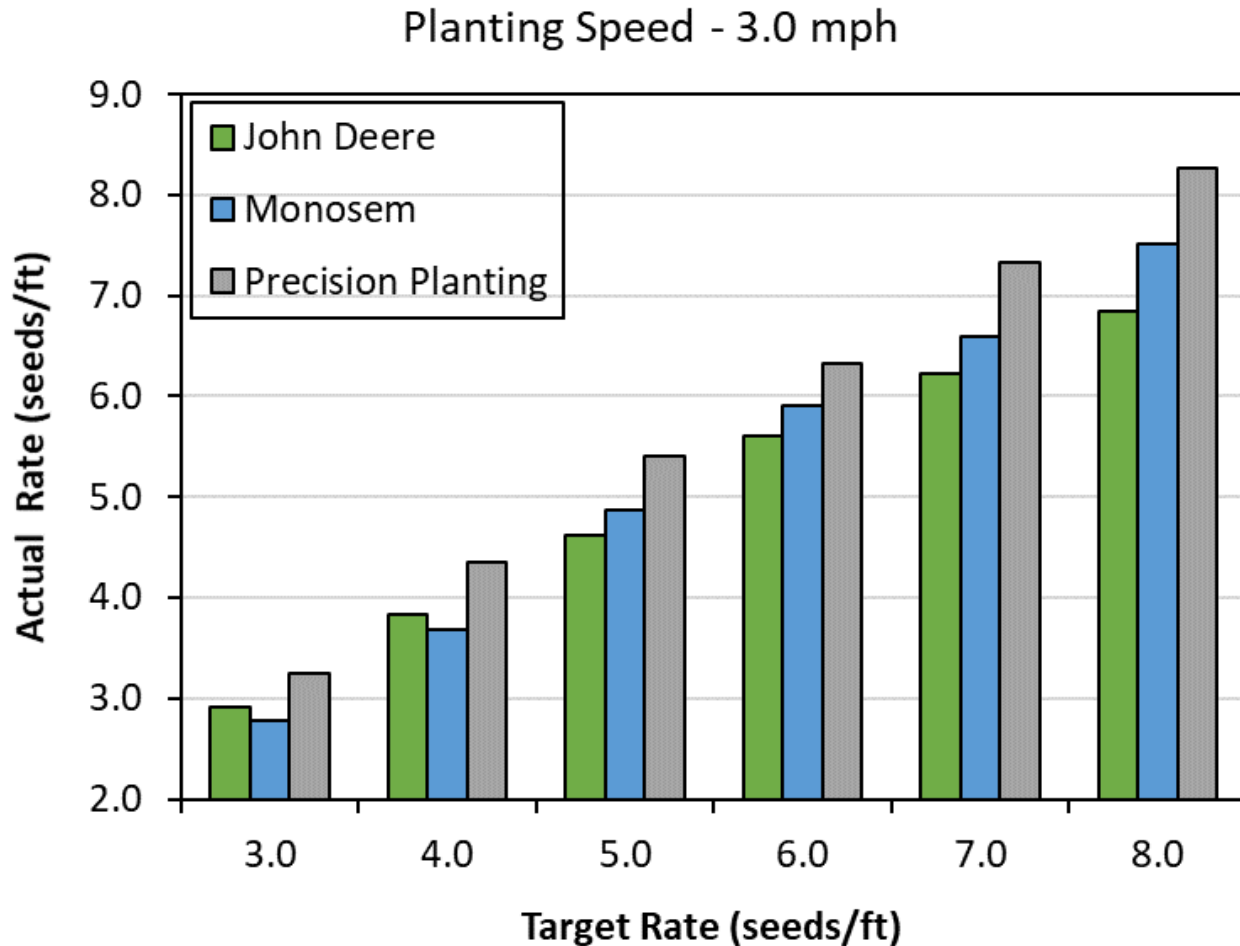
# Metering Performance Metrics

- Population
- Singulation (%)
- Skips and Multiples (%)
- Meter speed (rpm)
- Seed Spacing (as SRI)
- .....and few more based on crop type



# Results

## *Effect of Seeding Rate at Nominal Planting Speed*



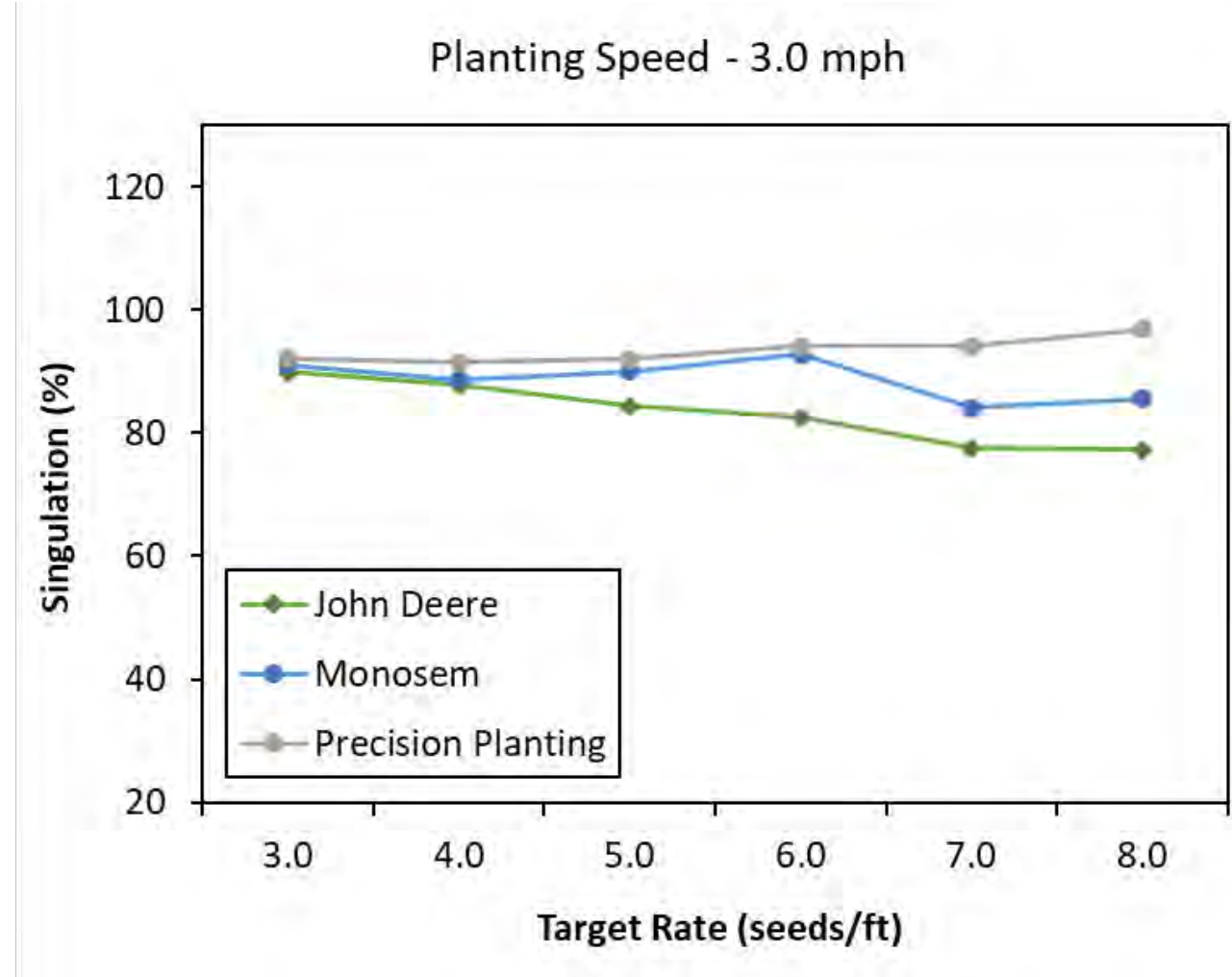
Target Rate (ksds/ac)	John Deere	Monosem	Precision Planting
43.6	42.3	40.5	47.1
58.1	55.7	53.4	63.2
72.6	67.1	70.6	78.4
87.1	81.4	85.8	91.8
101.9	90.5	95.7	106.3
116.2	99.5	109.0	120.0



# Seed Singulation

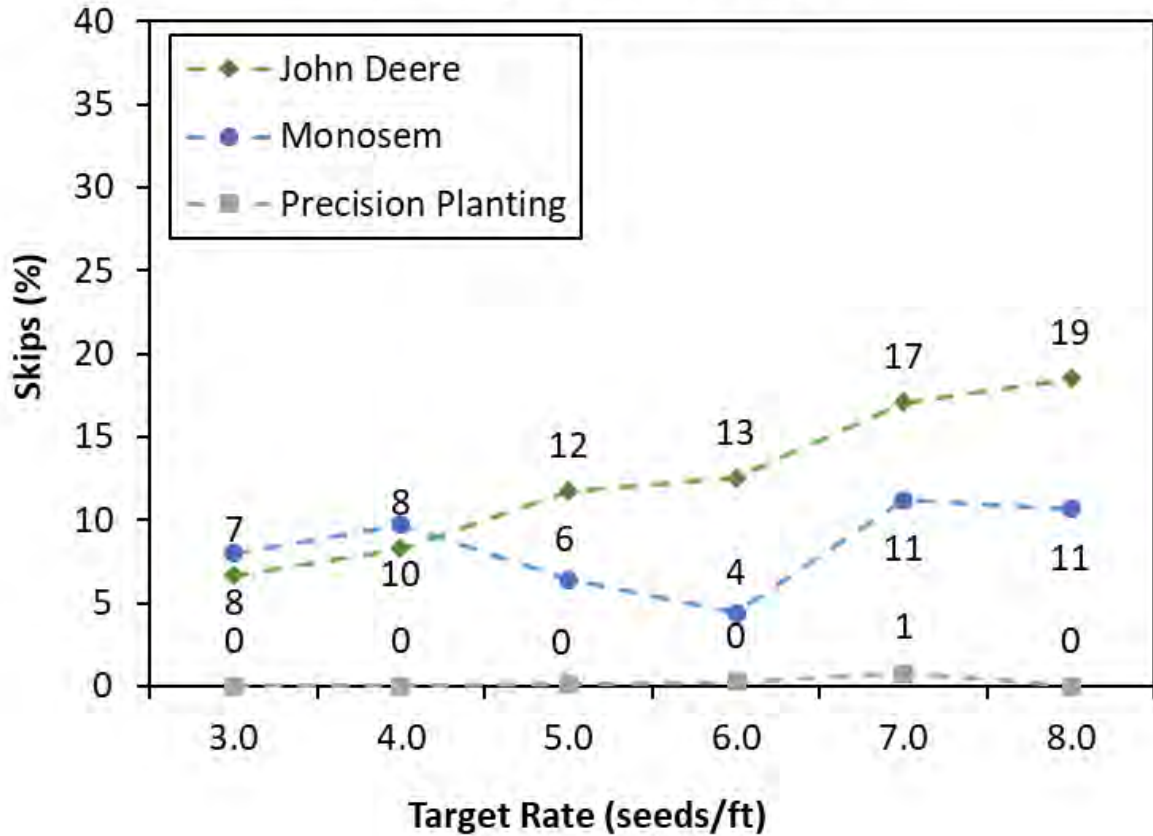
**Seed Singulation (%) = 100 – Skips (%) – Multiples (%)**

Target Rate	John Deere	Monosem	Precision Planting
43.6	90%	91%	92%
58.1	88%	89%	91%
72.6	84%	90%	92%
87.1	83%	93%	94%
101.9	77%	84%	94%
116.2	77%	86%	97%

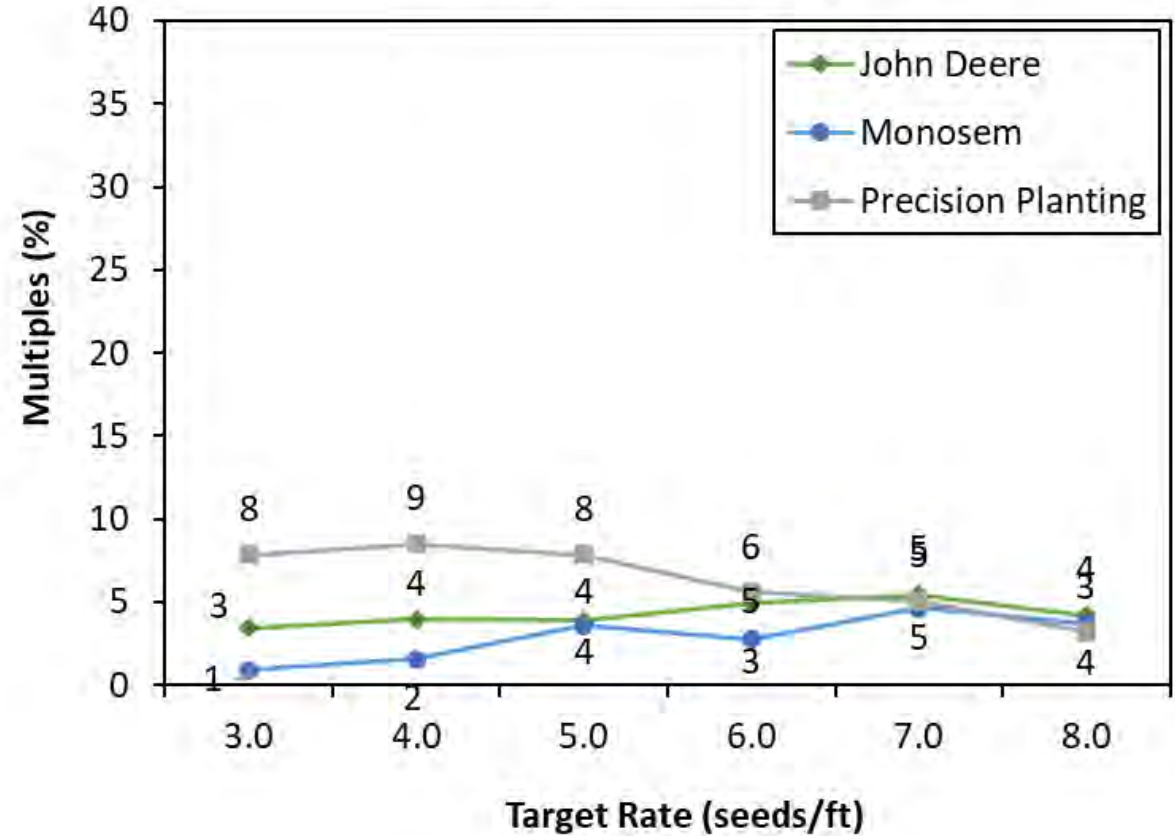


# Skips and Multiples

Planting Speed - 3.0 mph



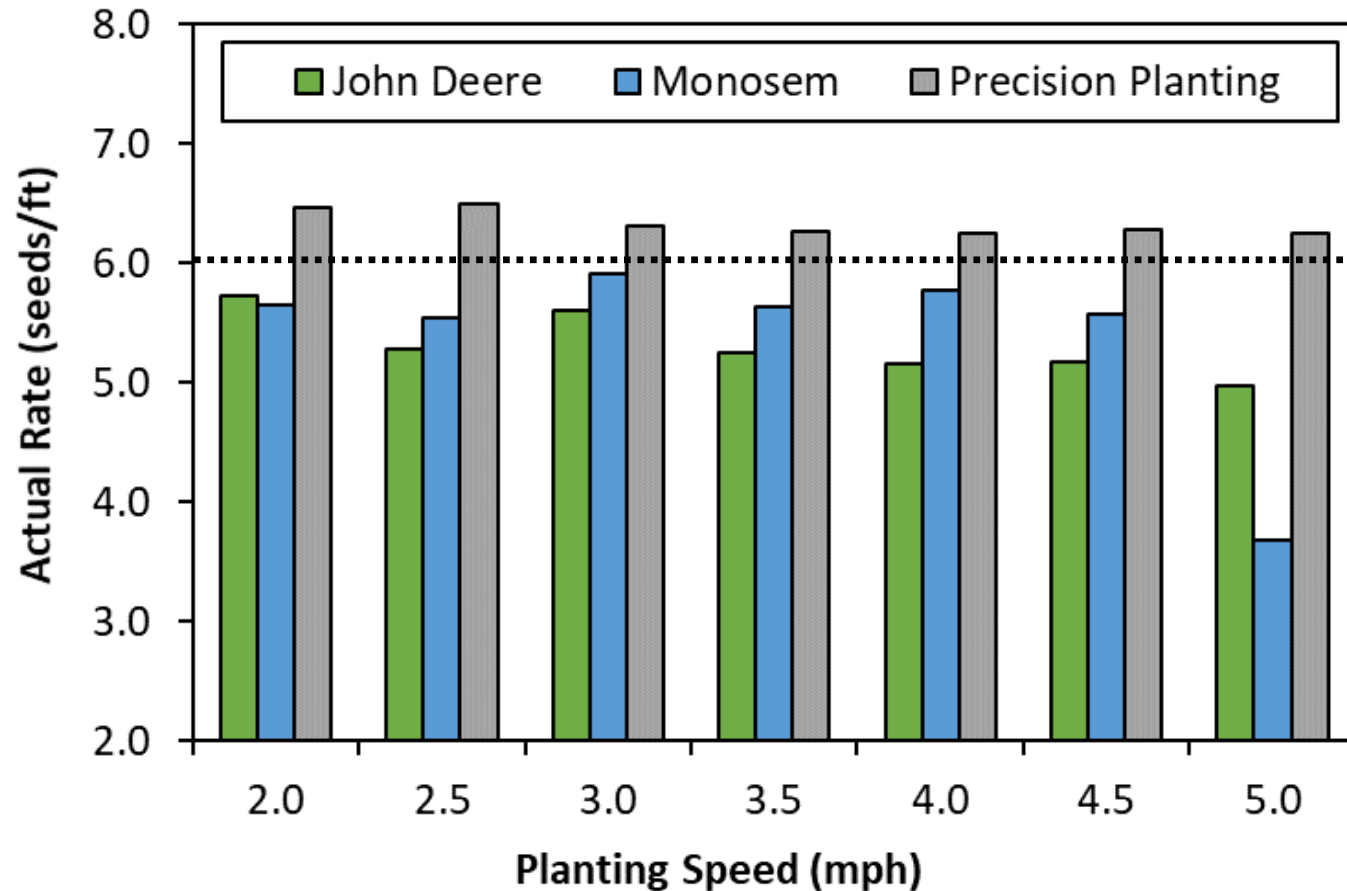
Planting Speed - 3.0 mph





## Effect of Planting Speed at Nominal Seeding Rate

Seeding Rate - 6 seeds/ft



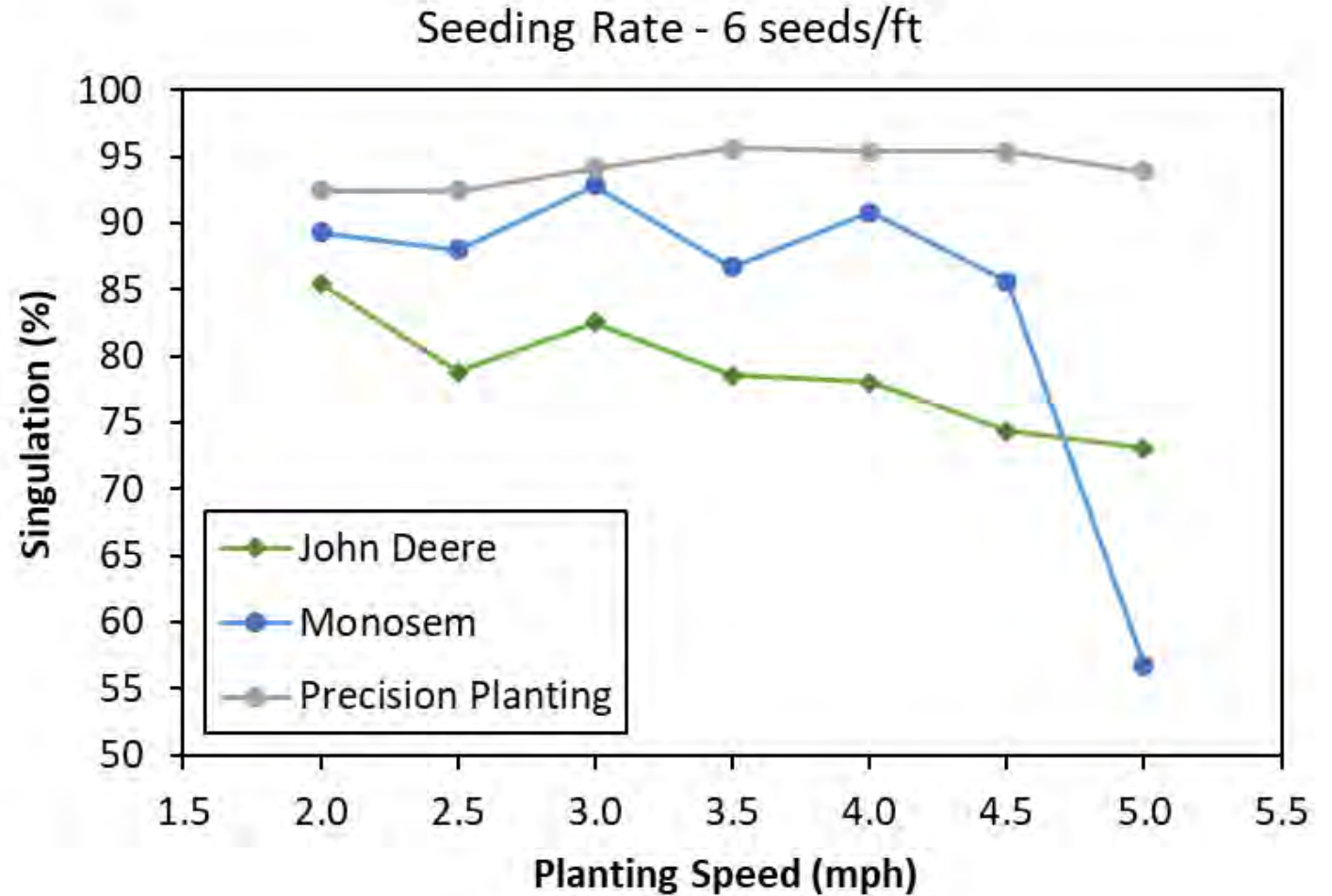
Seeding Rate – 87.1 kds/ac (@36 in. row spacing)

Planting Speed (mph)	John Deere	Monosem	Precision Planting
2.0	83.2	82.0	93.9
2.5	76.7	80.5	94.3
3.0	81.4	85.8	91.8
3.5	76.3	81.8	91.0
4.0	74.8	83.8	90.8
4.5	75.0	81.0	91.2
5.0	72.3	53.5	90.9

# Seed Singulation

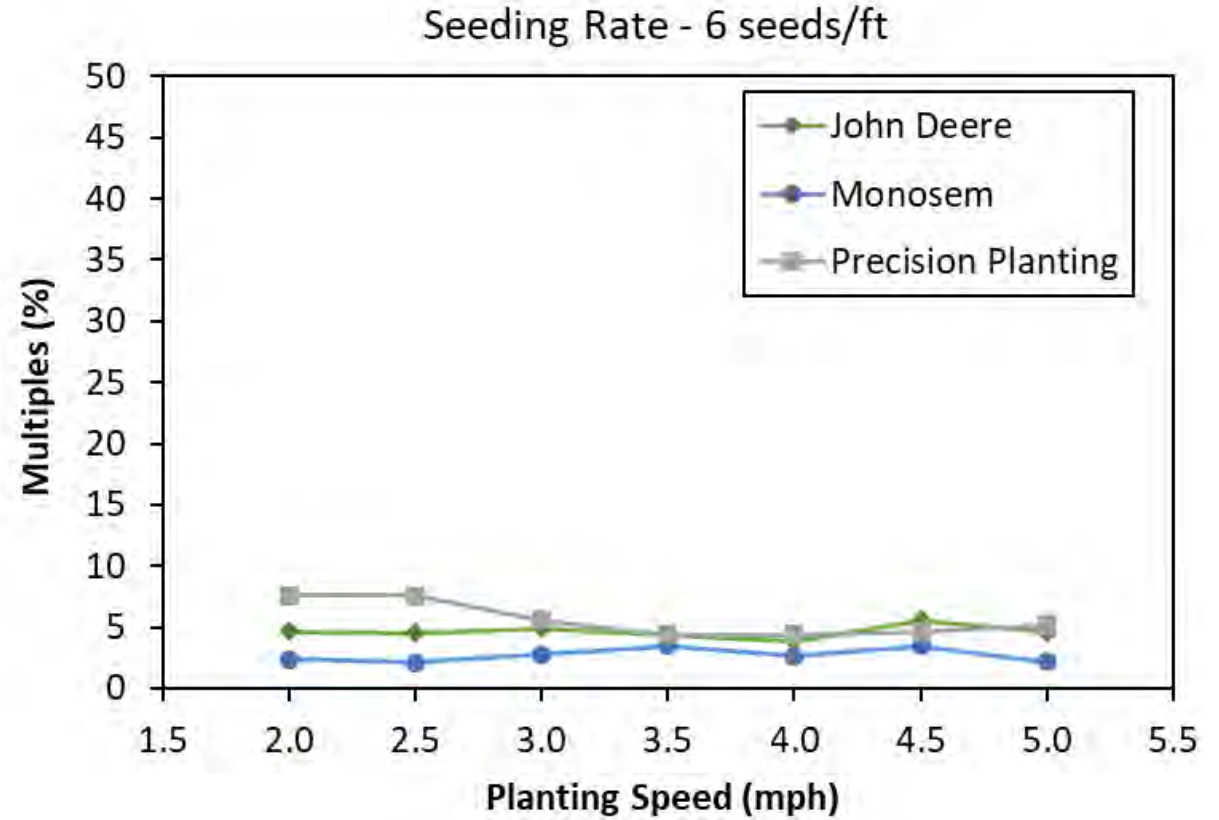
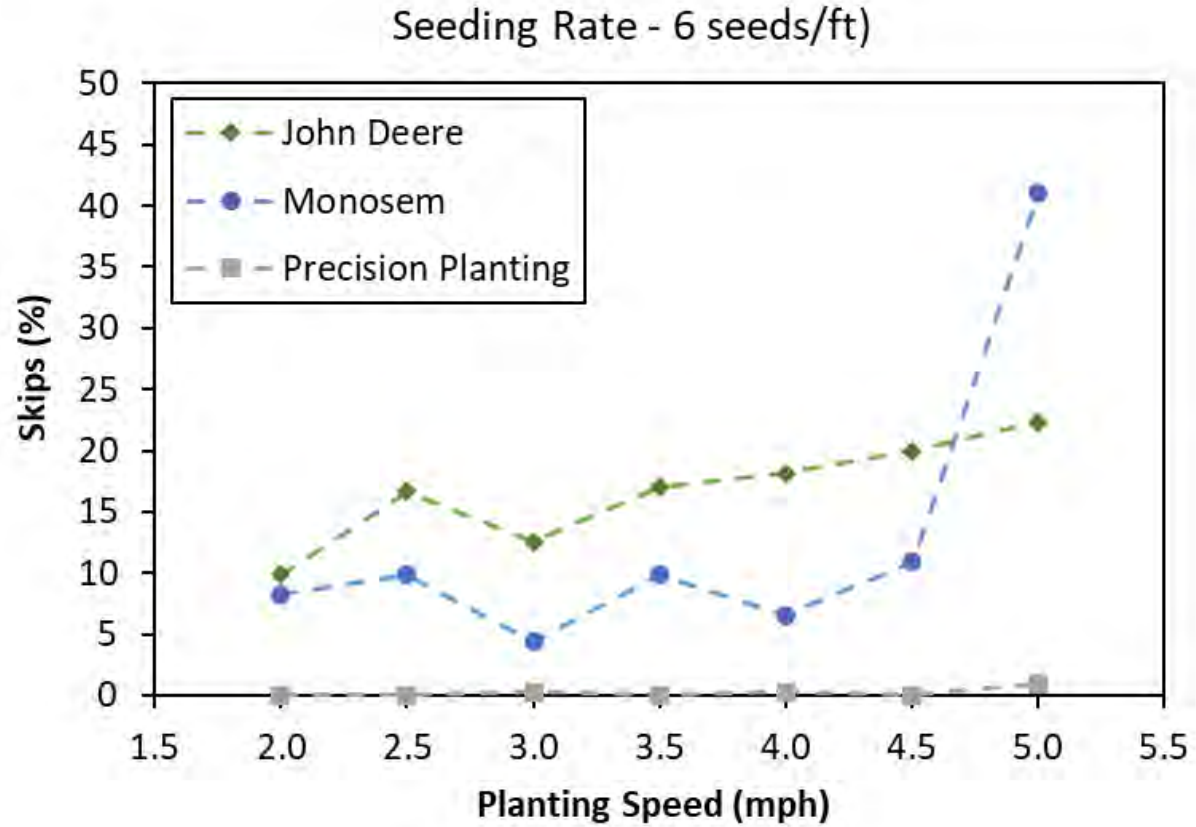
Singulation (%) at different speeds (6 seeds/ft)

Planting Speed (mph)	John Deere	Monosem	Precision Planting
2.0	85%	89%	92%
2.5	79%	88%	92%
3.0	83%	93%	94%
3.5	79%	87%	96%
4.0	78%	91%	95%
4.5	74%	86%	95%
5.0	73%	57%	93%



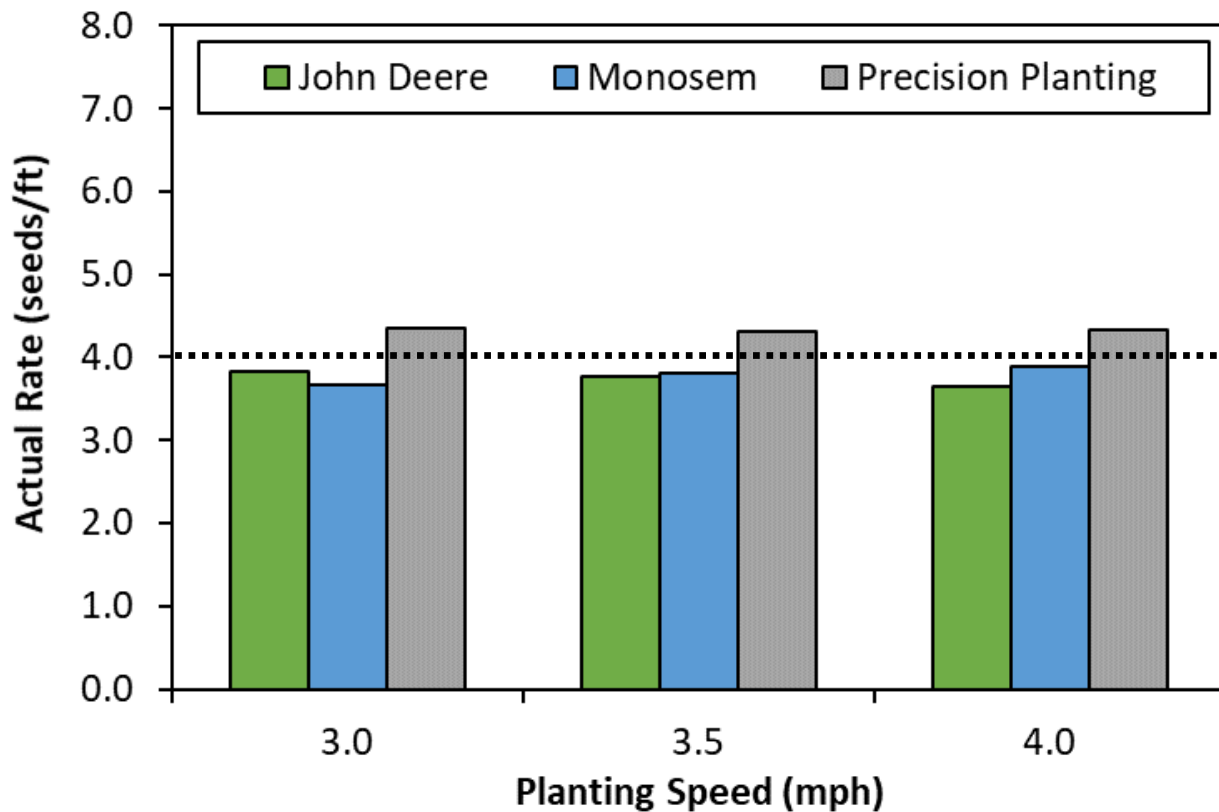


# Skips and Multiples

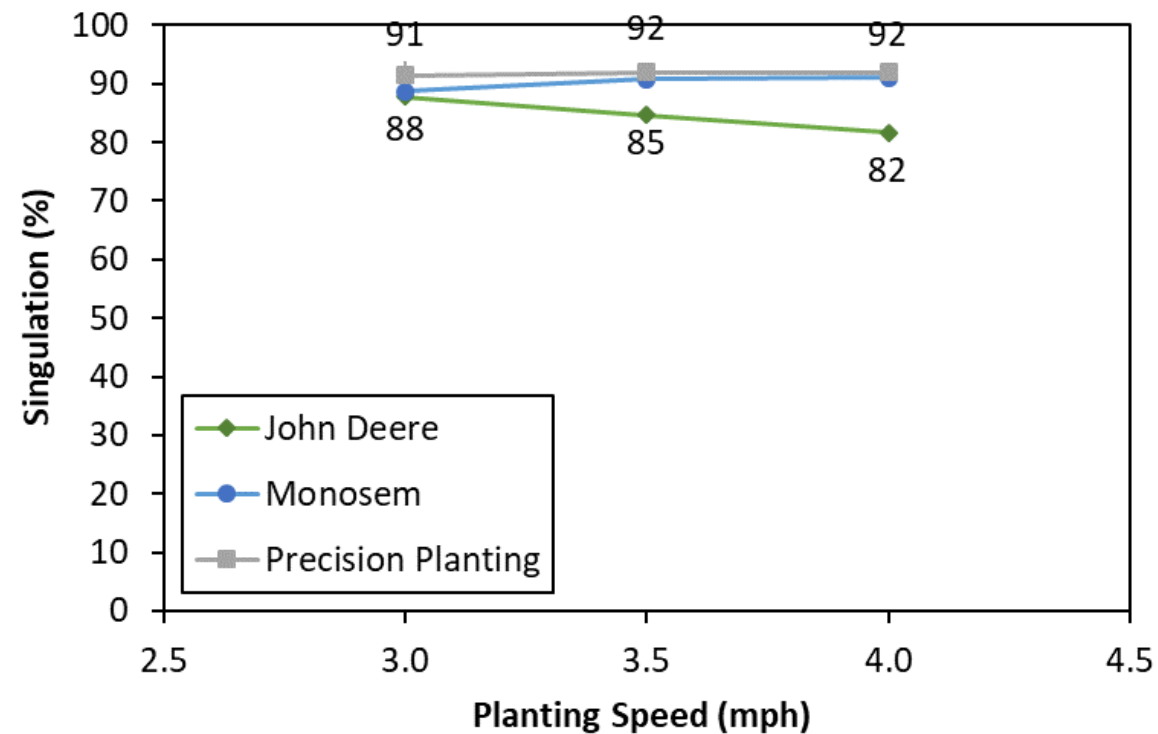


# Twin-Row Comparison between Seed Meters

Seeding Rate - 4 seeds/ft



Seeding Rate - 4 seeds/ft





# Singulation (%) performance at different combinations of seeding rates and planting speeds

## Monosem

Planting Speed (mph)	Seeding Rate (seeds/ft)					
	3	4	5	6	7	8
2.0	91	90	89	89	88	92
2.5	90	92	91	88	92	87
3.0	91	89	90	93	84	86
3.5	94	91	92	87	68	67
4.0	89	91	92	91	81	53
4.5	89	92	88	86	53	44
5.0	90	89	85	57	38	34

## John Deere

Planting Speed (mph)	Seeding Rate (seeds/ft)					
	3	4	5	6	7	8
2.0	90	88	88	85	87	82
2.5	90	86	84	79	78	85
3.0	90	88	84	83	77	77
3.5	86	85	81	79	77	78
4.0	85	82	78	78	73	71
4.5	91	82	78	74	71	69
5.0	84	80	75	73	71	62

## Precision Planting

Planting Speed (mph)	Seeding Rate (seeds/ft)					
	3	4	5	6	7	8
2.0	94	90	91	92	96	94
2.5	90	91	90	92	95	93
3.0	92	91	92	94	94	97
3.5	91	92	94	96	96	95
4.0	92	92	94	95	96	91
4.5	93	92	94	95	95	96
5.0	93	95	95	94	93	-

## John Deere

Planting Speed (mph)	Seeding Rate (seeds/ft)					
	3	4	5	6	7	8
2.0	90	88	88	85	87	82
2.5	90	86	84	79	78	85
3.0	90	88	84	83	77	77
3.5	86	85	81	79	77	78
4.0	85	82	78	78	73	71
4.5	91	82	78	74	71	69
5.0	84	80	75	73	71	62

## Monosem

Planting Speed (mph)	Seeding Rate (seeds/ft)					
	3	4	5	6	7	8
2.0	91	90	89	89	88	92
2.5	90	92	91	88	92	87
3.0	91	89	90	93	84	86
3.5	94	91	92	87	68	67
4.0	89	91	92	91	81	53
4.5	89	92	88	86	53	44
5.0	90	89	85	57	38	34

## Precision Planting

Planting Speed (mph)	Seeding Rate (seeds/ft)					
	3	4	5	6	7	8
2.0	94	90	91	92	96	94
2.5	90	91	90	92	95	93
3.0	92	91	92	94	94	97
3.5	91	92	94	96	96	95
4.0	92	92	94	95	96	91
4.5	93	92	94	95	95	96
5.0	93	95	95	94	93	-

# Summary

## ❑ John Deere:

- Low metering performance due to staggered cell design and lack of doubles eliminator.
- Performance degrades drastically at higher seeding rates and planting speeds.

## ❑ Monosem:

- Good metering performance due to singulated seed plate design and presence of a doubles eliminator.
- Performance starts to degrade above 4 mph planting speeds.

## ❑ Precision Planting:

- High metering performance (>90% singulation) due to electric seed metering and precision components.
- Consistent performance across different seeding rates and planting speeds.



# Thanks!

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