

Early Season UAN Applications in Sugar Beets



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UAN in-furrow (2014 trial)

Treatment	Beet Stand (plants/100ft)
Check (no nitrogen)	158
Urea (120 lb N/acre PPI*)	122
Urea (115 lb N/acre PPI) / <u>UAN (5 lb N/acre in-furrow)</u>	99
Urea (110 lb N/acre PPI) / <u>UAN (10 lb N/acre in-furrow)</u>	94
<i>LSD (.01)</i>	<i>15</i>

*PPI urea was applied and incorporated 2 days before planting



UAN at Emergence (2015 trial)

Treatment	Root Yield (tons / acre)
Check (no nitrogen)	31.7
Urea (120 lb N/acre PPI)	34.4
Urea (100 lb N/acre PPI) / <u>UAN (20 lb N/ac @ emerg.)</u>	36.1
<i>LSD (.05)</i>	<i>1.6</i>



UAN at Emergence (2016 trial)

Treatment	Root Yield (tons/acre)
Check (no nitrogen)	27.7
Urea (150 lb N/acre PPI)	33.6
Urea (130 lb N/acre PPI) / <u>UAN (20 lb N/ac @ emerg.)</u>	33.7
<i>LSD (.05)</i>	<i>1.5</i>



UAN Preemergence & Postemergence (2018 trial)

Treatment
Check (no UAN)
UAN (20 lb N/acre) – Preemergence
UAN (40 lb N/acre) – Preemergence
UAN (20 lb) – Pre–e, UAN (20 lb) at 2–leaf
UAN (20 lb) – Pre–e, UAN (20 lb) at 6–leaf
UAN (20 lb) – Pre–e, UAN (20 lb) at 2–leaf, UAN (20 lb) at 6–leaf

120 lbs N/acre urea was applied to all treatments in fall 2017



UAN Preemergence & Postemergence (2018 trial)

Treatment	Root Yield (tons/acre)
Check (no UAN)	37.6
UAN (20 lb N/acre) – Preemergence	38.4
UAN (40 lb N/acre) – Preemergence	37.2
UAN (20 lb) – Pre–e, UAN (20 lb) at 2–leaf	38.0
UAN (20 lb) – Pre–e, UAN (20 lb) at 6–leaf	37.7
UAN20 Pre–e, UAN20 at 2–leaf, UAN20 at 6–leaf	38.4
<i>LSD (.05)</i>	<i>NS</i>



UAN Preemergence & Postemergence (2019 trial)

Treatment	Test 1 Root Yield (tons/acre)	Test 2 Root Yield (tons/acre)
Check (no UAN)	40.6	30.5
UAN (20 lb N/acre) – Preemergence	41.0	30.1
UAN (40 lb N/acre) – Preemergence	40.8	29.0
UAN (20 lb) – Pre–e, UAN (20 lb) at 6–8 leaf	41.4	28.9
<i>LSD (.05)</i>	<i>NS</i>	<i>NS</i>

150 and 100 lbs N/acre ppi urea was applied to all treatments for tests 1 and 2, respectively.



UAN Preemergence (2020 trial)

Treatment	Root Yield (tons/ac)
Check (no UAN)	35.8
UAN (20 lb N/acre) – Preemergence	36.3
UAN (40 lb N/acre) – Preemergence	37.8
UAN (60 lb N/acre) – Preemergence	37.7
<i>LSD (.05)</i>	<i>NS</i>

No urea was applied to this test – Soil nitrate N was 126 lbs/acre to 4ft



UAN Preemergence (2021 trials)

Treatment	Test 1 Root Yield (t/ac)	Test 2 Root yield (t/ac)
Check (no UAN)	41.8	34.9
UAN (20 lb N/acre) – Pre–e	42.8	34.4
UAN (40 lb N/acre) – Pre–e	43.6	34.7
<i>LSD (.05)</i>	<i>NS</i>	<i>NS</i>



UAN Preemergence – with and without urea (2022 to 2024 trials)

Treatment
0 fall urea / 0 spring UAN (Check)
0 fall urea / 20 spring UAN
0 fall urea / 40 spring UAN
recommended fall urea / 0 spring UAN
recommended fall urea / 20 spring UAN
recommended fall urea / 40 spring UAN

Recommended fall urea was 120, 125 and 150 lbs/acre in 2022, 2023 and 2024, respectively.



UAN Preemergence – with and without urea (2022 trial)

Treatment	Vigor (1–9)	Root Yield (tons/acre)
0 fall urea / 0 spring UAN (Check)	6.8	34.1
0 fall urea / 20 spring UAN	7.5	35.8
0 fall urea / 40 spring UAN	7.7	37.7
120 fall urea / 0 spring UAN	6.8	37.1
120 fall urea / 20 spring UAN	8.0	37.3
120 fall urea / 40 spring UAN	8.0	37.6
<i>LSD (.05)</i>	<i>0.5</i>	<i>NS</i>



UAN Preemergence – with and without urea (2023 trial)

Treatment	July Vigor (1–9)	Root Yield (tons/acre)
0 fall urea / 0 spring UAN (Check)	6.0	42.3
0 fall urea / 20 spring UAN	6.2	43.1
0 fall urea / 40 spring UAN	7.1	44.2
125 fall urea / 0 spring UAN	8.2	49.1
125 fall urea / 20 spring UAN	8.1	48.9
125 fall urea / 40 spring UAN	8.2	48.4
<i>LSD (.05)</i>	<i>0.6</i>	<i>2.5</i>



UAN Preemergence – with and without urea (2024 trial)

Treatment	Root Yield (tons/acre)
0 fall urea / 0 spring UAN (Check)	35.2
0 fall urea / 20 spring UAN	37.5
0 fall urea / 40 spring UAN	38.3
150 fall urea / 0 spring UAN	37.1
150 fall urea / 20 spring UAN	39.5
150 fall urea / 40 spring UAN	39.1
<i>LSD (.05)</i>	<i>2.4</i>



UAN Trial - August 1, 2024



Untreated Check



40 lbs N/ac Spring UAN



Fall urea +
40 lbs N/acre Spring UAN

UAN + Glyphosate in Sugar Beets



Is it Safe to Mix Them Together?

UAN/Glyphosate Mixture (2022 trial)

Treatment	Root Yield (tons/acre)
Check (no UAN or glyphosate)	35.1
UAN (25 lbs N/acre) + glyphosate	37.7
<i>LSD (.05)</i>	<i>1.7</i>

Glyphosate rate = 31 US oz/ac Roundup WeatherMax



UAN/Glyphosate Mixture

(2023 trial)

Treatment	Application Date	Ambient Temperature
1. Check (no UAN or glyphosate)	–	–
2. UAN (25 lbs N/acre)	June 2	20°C (68°F)
3. UAN (25 lbs N/acre) + glyphosate*	June 2	20°C (68°F)
4. UAN (25 lbs N/acre)	June 4	30°C (86°F)
5. UAN (25 lbs N/acre) + glyphosate*	June 4	30°C (86°F)

*Glyphosate rate = 31 US oz/acre Roundup WeatherMax

Treatments 3 and 5 were 84% UAN, 2% glyphosate and 14% water.



UAN /Glyphosate Mixture (2023 trial)

Treatment	Beet Vigour (1-9)	Root Yield (tons/ac)
Check (no UAN or glyphosate)	7.8	45.5
UAN 25 lbs N/acre (68°F)	7.8	47.3
UAN 25 lbs N/acre + glyphosate (68°F)	7.6	46.4
UAN 25 lbs N/acre (86°F)	7.8	47.0
UAN 25 lbs N/acre + glyphosate (86°F)	7.8	47.0
<i>LSD (.05)</i>	<i>NS</i>	<i>NS</i>



Summary

- ▶ 13 trials over 9 years assessed additional gains with UAN applied along with recommended ppi urea rates.
- ▶ 3 trials had statistically significant root yield increases averaging 2.2 tons/acre when the best UAN treatment was spring applied after a ppi urea application.
- ▶ 3 trials had non-significant root yield increases averaging 1.9 tons/acre when the best UAN treatment was spring applied in addition to urea.
- ▶ 4 trials had non-significant root yield increases averaging 0.6 tons/acre when the best UAN treatment was spring applied in addition to urea.
- ▶ Spring UAN did not have any effect on sugar beet root yield in 3 trials.
- ▶ In 3 trials that included UAN treatments without ppi urea (nitrogen deficient conditions), root yield was significantly increased by 1.7 tons/acre with a 20 lb N/acre UAN application and 3.0 tons/acre with a 40 lb N/acre UAN application compared to an unfertilized check.



Acknowledgements

Lantic Inc.

Alberta Sugar Beet Growers



Questions?

