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• 2017 - 2018 •

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ARM UTM ADVANCED

● INTELLIGENT NITROGEN STABILIZERS



RESEARCH SITES • SOIL PROPERTIES

| Year | 2016 | 2016 | 2017 | 2017 |
|----------------------|------------|----------------|------------|-----------------|
| Soil source/location | Carman, MB | High bluff, MB | Carman, MB | Portage, MB |
| Soil type | Sandy loam | Loam | Sandy loam | Silty clay loam |
| Soil pH | 5.8 | 7.7 | 6.7 | 7.9 |
| Organic Matter [%] | 3.9 | 4.7 | 3.2 | 7.1 |



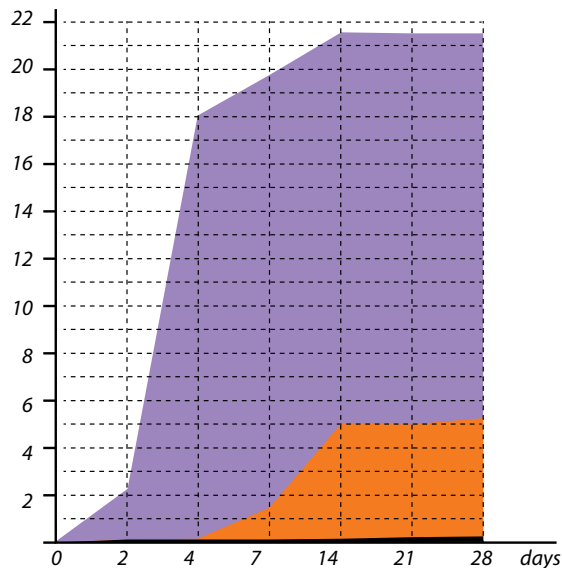


VOLATILIZATION & YIELD DATA - ARM U™ ADVANCED (UOM*/UOW**) (UOM*/UOW**)

Cumulative ammonia loss • Wheat • Carman, Manitoba (kg N/ha)

| Treatment | Day 2 | Day 4 | Day 7 | Day 14 | Day 21 | Day 28 |
|------------------------|-------|-------|-------|--------|--------|--------|
| Check | 0.1 | 0.2 | 0.2 | 0.2 | 0.3 | 0.3 |
| Urea + ARM U™ ADVANCED | 0.1 | 0.2 | 1.5 | 5.0 | 5.0 | 5.1 |
| Urea | 2.2 | 18.0 | 19.8 | 21.6 | 21.6 | 21.6 |

| Treatment | % reduction | kg of N saved/ha | kg of urea saved/ha | Yield (bu/acre) | % Change |
|------------------------|-------------|------------------|---------------------|-----------------|----------|
| Check | | | | 30.4 | |
| Urea + ARM U™ ADVANCED | 78% | 16.6 | 36 | 33.9 | 11.5 |
| Urea | | | | 31.2 | 2.6 |



- Check
- Urea + ARM U™ Advanced **78% reduction • 11.5% yield increase**
- Urea **2.6% yield increase**

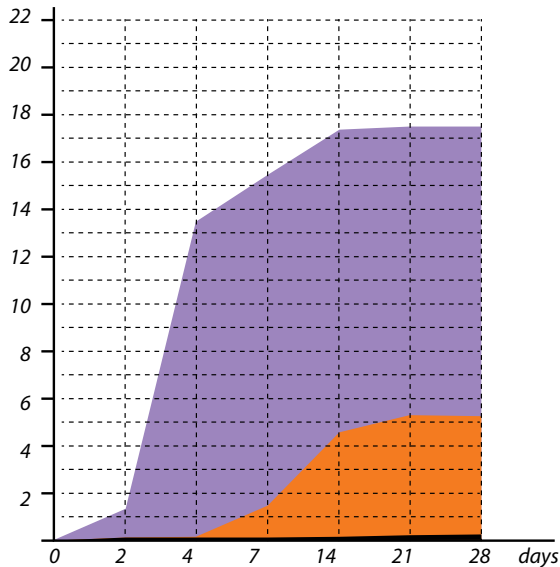


VOLATILIZATION & YIELD DATA - ARM U™ ADVANCED (UOM*/UOW)**

Cumulative ammonia loss • Canola • Carman, Manitoba (kg N/ha)

| Treatment | Day 2 | Day 4 | Day 7 | Day 14 | Day 21 | Day 28 |
|-----------------------|-------|-------|-------|--------|--------|--------|
| Check | 0.1 | 0.1 | 0.1 | 0.2 | 0.2 | 0.2 |
| Urea+ ARM U™ ADVANCED | 0.1 | 0.1 | 1.3 | 4.8 | 5.1 | 5.1 |
| Urea | 1.3 | 13.4 | 15.4 | 16.7 | 16.8 | 16.8 |

| Treatment | % reduction | kg of N saved/ha | kg of urea saved/ha | Yield (bu/acre) | % Change |
|------------------------|-------------|------------------|---------------------|-----------------|----------|
| Check | | | | | |
| Urea + ARM U™ ADVANCED | 71% | 11.7 | 25.4 | 37.4 | 15.8 |
| Urea | | | | 32.3 | |



- Check
- Urea + ARM U™ Advanced **71% reduction • 15.8% yield increase**
- Urea

* UOM-University of Manitoba; ** UOW-University of Winnipeg

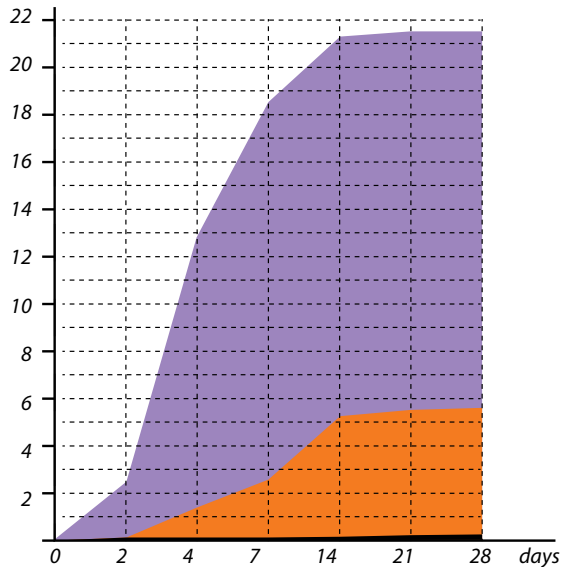


VOLATILIZATION & YIELD DATA - ARM U™ ADVANCED (UOM*/UOW)**

Cumulative ammonia loss • Canola • High Bluff, Manitoba (kg N/ha)

| Treatment | Day 2 | Day 4 | Day 7 | Day 14 | Day 21 | Day 28 |
|------------------------|-------|-------|-------|--------|--------|--------|
| Check | 0.1 | 0.2 | 0.2 | 0.2 | 0.2 | 0.3 |
| Urea + ARM U™ ADVANCED | 0.1 | 1.4 | 2.7 | 5.2 | 5.4 | 5.5 |
| Urea | 2.6 | 12.9 | 18.5 | 21.3 | 21.6 | 21.6 |

| Treatment | % reduction | kg of N saved/ha | kg of urea saved/ha | Yield (bu/acre) | % Change |
|------------------------|-------------|------------------|---------------------|-----------------|----------|
| Check | | | | | |
| Urea + ARM U™ ADVANCED | 76% | 16.1 | 35.0 | 39.3 | 178.7 |
| Urea | | | | 14.1 | |

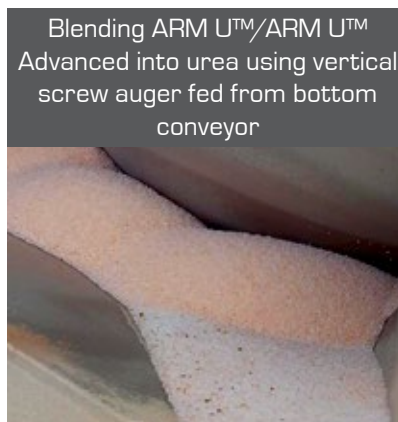
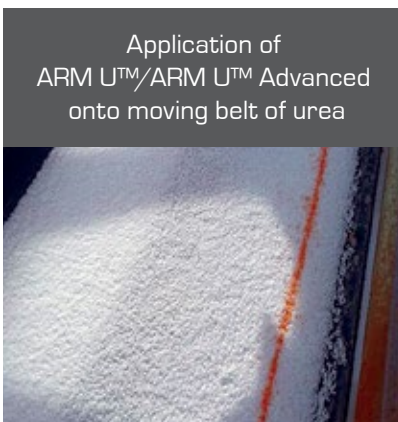
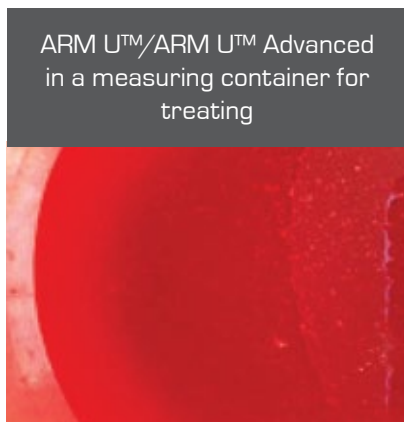


- Check
- Urea + ARM U™ Advanced **76% reduction • 178.7% yield increase**
- Urea



**APPLICATION RATE STUDY -
ARM U™, ARM U™ ADVANCED (UOM*/UOW**)**

| Treatment | Dry matter yield, g pot ⁻¹ | N uptake, mg pot ⁻¹ | P uptake, mg pot ⁻¹ | NUE, %*** |
|------------------------------------|---------------------------------------|--------------------------------|--------------------------------|-----------|
| Urea+ ARM U™ (2L/1000kg) | 5.6 a | 60.1 abc | 7.6 ab | 38 abc |
| UAN+ ARM U™ (1L/1000kg) | 5.6 a | 65.1 a | 8.2 a | 44 a |
| Urea+ARM U™ ADVANCED (1L/1000kg) | 5.1 a | 54.6 cd | 7.4 ab | 32 cd |
| Urea+ARM U™ ADVANCED (1.5L/1000kg) | 5.5. a | 56.3 bed | 7.6 ab | 34 bcd |
| Urea+ARM U™ ADVANCED (2L/1000kg) | 5.4 a | 55.5 bcd | 7.4 ab | 33 bcd |
| UAN+ARM U™ ADVANCED (1L/1000kg) | 5.4 a | 62.5 ab | 6.8 bc | 41 ab |
| UAN+ARM U™ ADVANCED (2L/1000kg) | 5.3 a | 65.6 a | 8.0 ab | 45 a |
| Untreated urea | 4.8 a | 50.8 d | 7.8 ab | 27 d |
| Untreated UAN | 5.3 a | 57.6 bcd | 8.7 a | 35 bcd |
| No N fertilizer | 3.1 b | 27.9 e | 5.9 c | — |

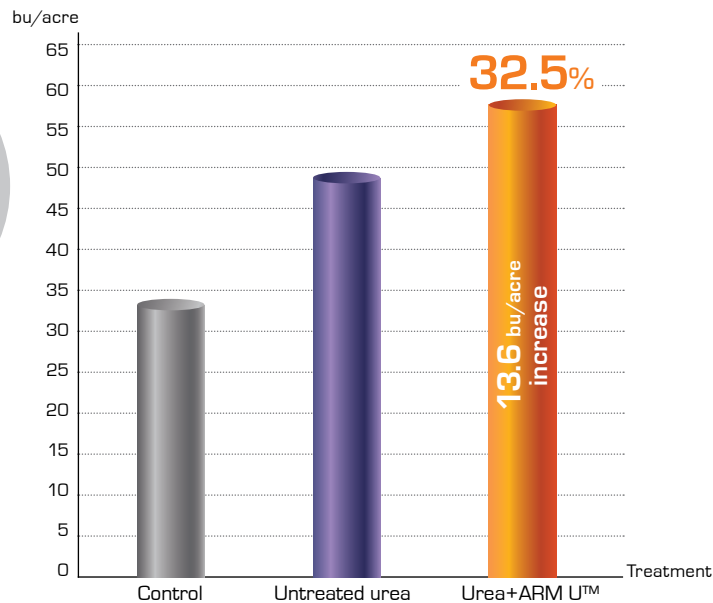


* UOM-University of Manitoba; ** UOW-University of Winnipeg; ***Nitrogen Use Efficiency

WHEAT • CARMAN MANITOBA Fall applied UREA + ARM U™

Cumulative ammonia volatilization loss

| Cumulative ammonia volatilization loss (kg N/ha) | Day 0-7 | Day 14-21 | Total | % reduction | Yield (bu/acre) | % change |
|--|---------|-----------|-------|-------------|-----------------|----------|
| Control (without urea and UAN) | 0.4 | 0.1 | 0.5 | | 33.3 | |
| Untreated urea @ 100 kg N/ha | 7.9 | 8.8 | 16.7 | | 41.9 | |
| Urea coated with ARM U™ (2 L/1000 kg rate) @ 100 kg N/ha | 0.3 | 4.7 | 5.0 | 70.0 | 55.5 | 32.5 |
| Urea + Commercial Product (2 L/1000 kg rate) @ 100 kg N/ha | 0.5 | 8.0 | 8.5 | 49.0 | 52.6 | 25.5 |

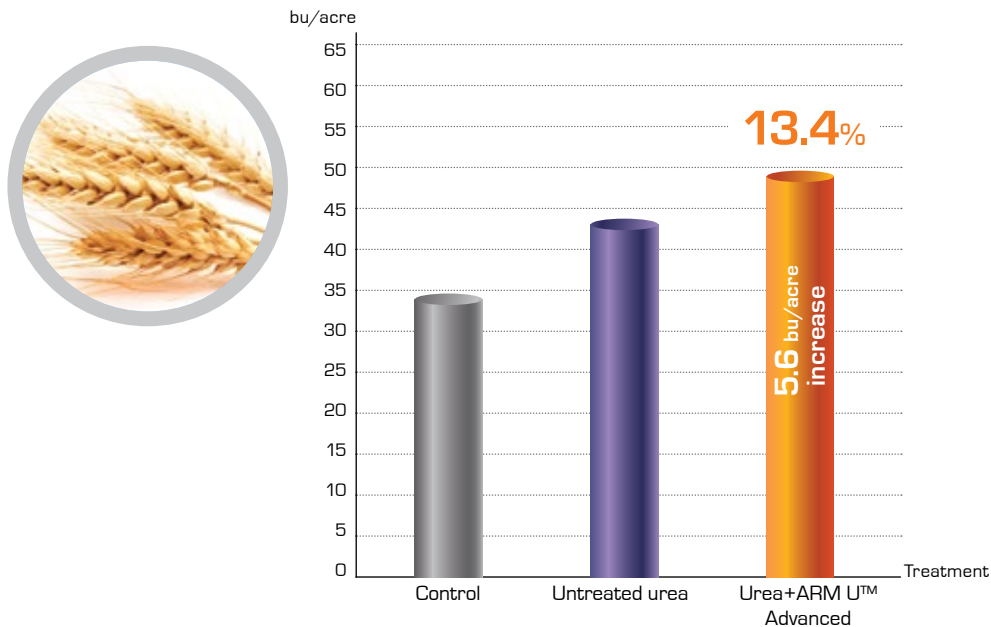




WHEAT • CARMAN MANITOBA Fall applied UREA + ARM U™ ADVANCED

Cumulative ammonia volatilization loss

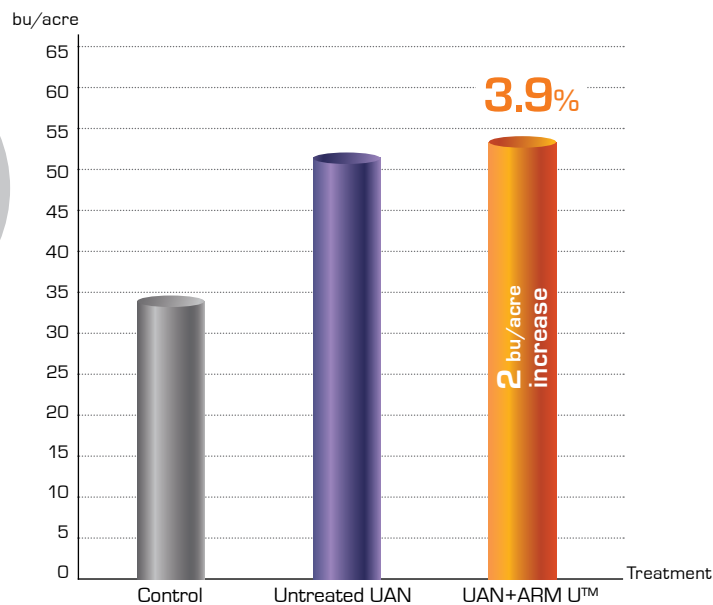
| Cumulative ammonia volatilization loss (kg N/ha) | Day 0-7 | Day 14-21 | Total | % reduction | Yield (bu/acre) | % change |
|---|---------|-----------|-------|-------------|-----------------|----------|
| Control (without urea and UAN) | 0.4 | 0.1 | 0.5 | | 33.3 | |
| Untreated urea @ 100 kg N/ha | 7.9 | 8.8 | 16.7 | | 41.9 | |
| Urea coated with ARM U™ Advanced (1.5 L/1000 kg rate) @ 100 kg N/ha | 0.3 | 3.9 | 4.2 | 75.0 | 47.5 | 13.4 |



WHEAT • CARMAN MANITOBA Fall applied UAN + ARM U™

Cumulative ammonia volatilization loss

| Cumulative ammonia volatilization loss (kg N/ha) | Day 0-7 | Day 14-21 | Total | % reduction | Yield (bu/acre) | % change |
|--|---------|-----------|-------|-------------|-----------------|----------|
| Control (without urea and UAN) | 0.4 | 0.1 | 0.5 | | 34.0 | |
| Untreated UAN @ 100 kg N/ha | 0.7 | 6.1 | 6.8 | | 51.2 | |
| UAN mixed with ARM U™ (1.5 L/1000 L rate) @ 100 kg N/ha | 0.5 | 1.8 | 2.4 | 62.0 | 53.2 | 3.9 |
| UAN + Commercial Product (1.5 L/1000 L rate) @ 100 kg N/ha | 0.4 | 1.5 | 1.9 | 72.0 | 52.0 | 1.6 |

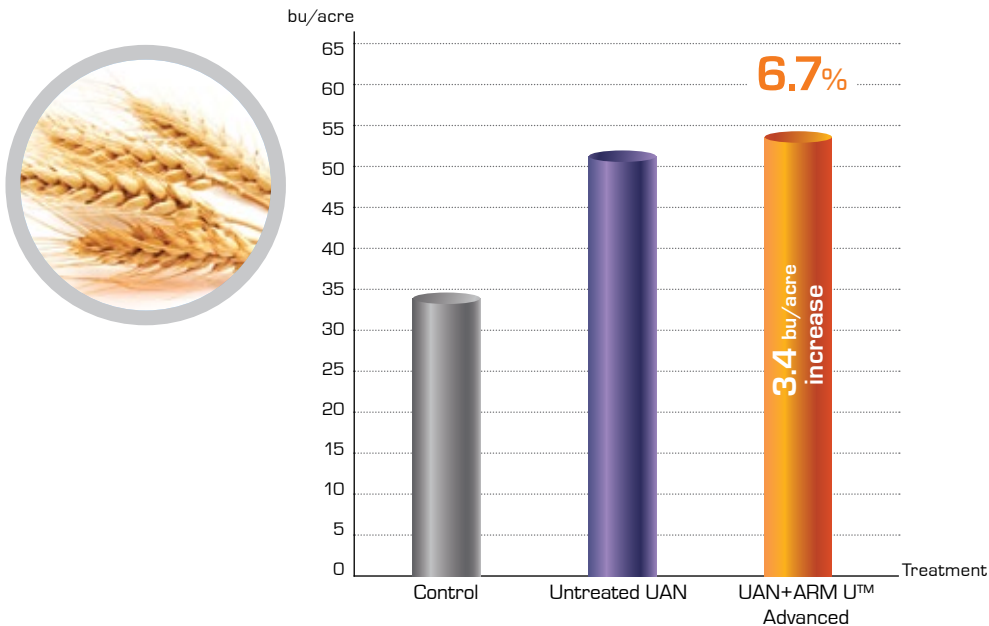




WHEAT • CARMAN MANITOBA Fall applied UAN + ARM U™ ADVANCED

Cumulative ammonia volatilization loss

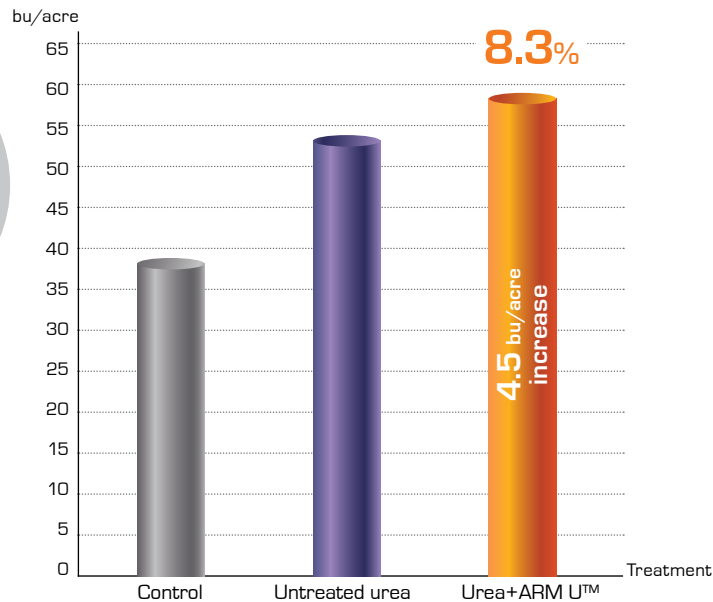
| Cumulative ammonia volatilization loss (kg N/ha) | Day 0-7 | Day 14-21 | Total | % reduction | Yield (bu/acre) | % change |
|--|---------|-----------|-------|-------------|-----------------|----------|
| Control (without urea and UAN) | 0.4 | 0.1 | 0.5 | | 34.0 | |
| Untreated UAN @ 100 kg N/ha | 0.7 | 6.1 | 6.8 | | 51.0 | |
| UAN mixed with ARM U™ Advanced (1.5 L/1000 L rate) @ 100 kg N/ha | 0.4 | 1.3 | 1.7 | 75.0 | 54.4 | 6.7 |



CANOLA • CARMAN MANITOBA Fall applied UREA + ARM U™

Cumulative ammonia volatilization loss

| Cumulative ammonia volatilization loss (kg N/ha) | Day 0-7 | Day 14-21 | Total | % reduction | Yield (bu/acre) | % change |
|--|---------|-----------|-------|-------------|-----------------|----------|
| Control (without urea and UAN) | 0.2 | 0 | 0.2 | | 38.9 | |
| Untreated urea @ 100 kg N/ha | 10.8 | 6.7 | 17.5 | | 53.9 | |
| Urea coated with ARM U™ (2 L/1000 kg rate) @ 100 kg N/ha | 0.2 | 3.2 | 3.4 | 81.0 | 58.4 | 8.3 |
| Urea + Commercial Product (2 L/1000 kg rate) @ 100 kg N/ha | 0.3 | 4.3 | 4.6 | 73.0 | 56.6 | 5.0 |

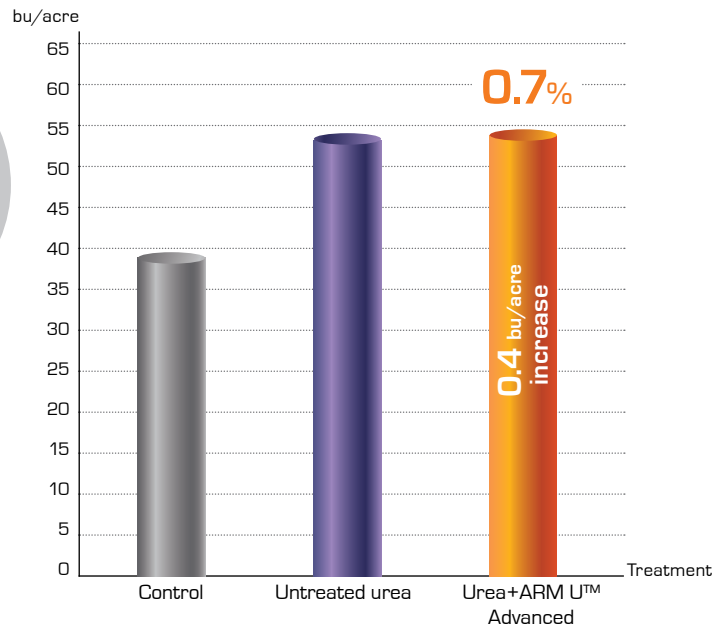




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Cumulative ammonia volatilization loss

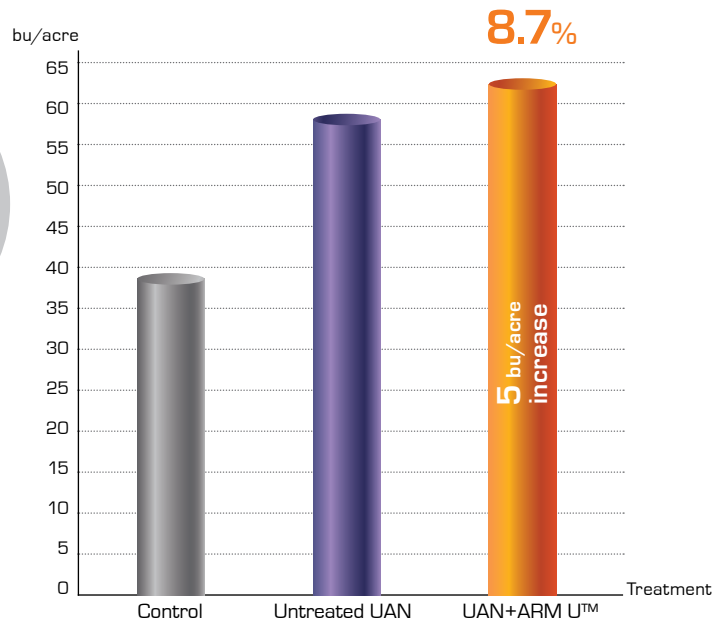
| Cumulative ammonia volatilization loss (kg N/ha) | Day 0-7 | Day 14-21 | Total | % reduction | Yield (bu/acre) | % change |
|---|---------|-----------|-------|-------------|-----------------|----------|
| Control (without urea and UAN) | 0.2 | 0 | 0.2 | | 38.9 | |
| Untreated urea @ 100 kg N/ha | 10.8 | 6.7 | 17.5 | | 53.9 | |
| Urea coated with ARM U™ Advanced (1.5 L/1000 kg rate) @ 100 kg N/ha | 0.4 | 4.4 | 4.8 | 73.0 | 54.3 | 0.7 |



CANOLA • CARMAN MANITOBA Fall applied UAN + ARM U™

Cumulative ammonia volatilization loss

| Cumulative ammonia volatilization loss (kg N/ha) | Day 0-7 | Day 14-21 | Total | % reduction | Yield (bu/acre) | % change |
|--|---------|-----------|-------|-------------|-----------------|----------|
| Control (without urea and UAN) | 0.2 | 0 | 0.2 | | 38.9 | |
| Untreated UAN @ 100 kg N/ha | 0.5 | 1.3 | 1.8 | | 57.6 | |
| UAN mixed with ARM U™ (1.5 L/1000 L rate) @ 100 kg N/ha | 0.4 | 1.3 | 1.4 | 22.0 | 62.6 | 8.7 |
| UAN + Commercial Product (1.5 L/1000 L rate) @ 100 kg N/ha | 0.2 | 0.8 | 1.0 | 47.0 | 58.4 | 1.4 |

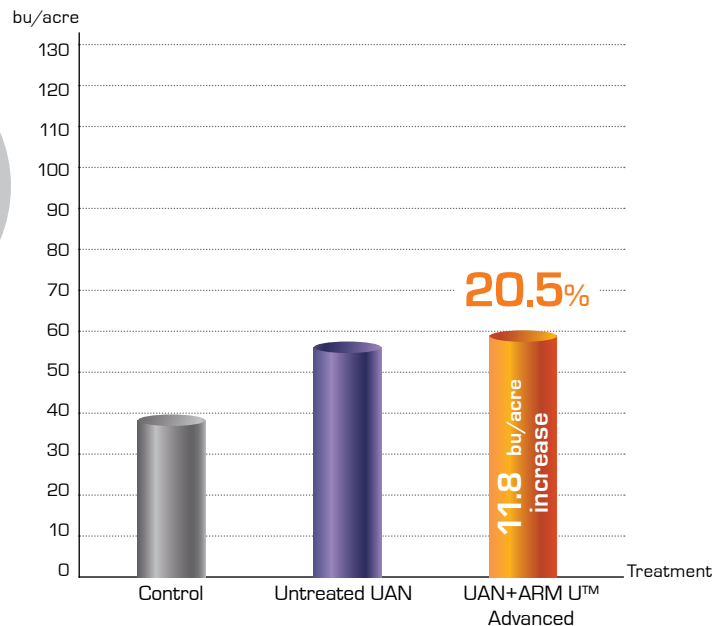




CANOLA • CARMAN MANITOBA Fall applied UAN + ARM U™ ADVANCED

Cumulative ammonia volatilization loss

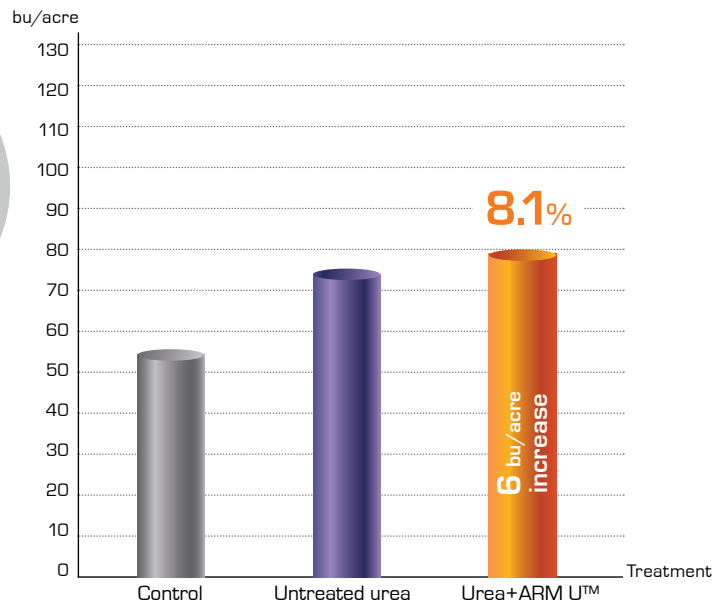
| Cumulative ammonia volatilization loss (kg N/ha) | Day 0-7 | Day 14-21 | Total | % reduction | Yield (bu/acre) | % change |
|--|---------|-----------|-------|-------------|-----------------|----------|
| Control (without urea and UAN) | 0.2 | 0 | 0.2 | | 38.9 | |
| Untreated urea @ 100 kg N/ha | 0.5 | 1.3 | 1.8 | | 57.6 | |
| UAN mixed with ARM U™ Advanced (1.5 L/1000 L rate) @ 100 kg N/ha | 0.4 | 1.1 | 1.1 | 56.0 | 69.4 | 20.5 |



WHEAT • PORTAGE MANITOBA Fall applied UREA + ARM U™

Cumulative ammonia volatilization loss

| Cumulative ammonia volatilization loss (kg N/ha) | Day 0-7 | Day 14-21 | Total | % reduction | Yield (bu/acre) | % change |
|--|---------|-----------|-------|-------------|-----------------|----------|
| Control (without urea and UAN) | 0.4 | 0.1 | 0.5 | | 53.4 | |
| Untreated urea @ 100 kg N/ha | 8.0 | 4.1 | 12.1 | | 73.9 | |
| Urea coated with ARM U™ (2 L/1000 kg rate) @ 100 kg N/ha | 1.0 | 2.2 | 3.2 | 74.0 | 79.9 | 8.1 |
| Urea + Commercial Product (2 L/1000 kg rate) @ 100 kg N/ha | 1.0 | 4.3 | 5.3 | 56.0 | 65.7 | -11.1 |

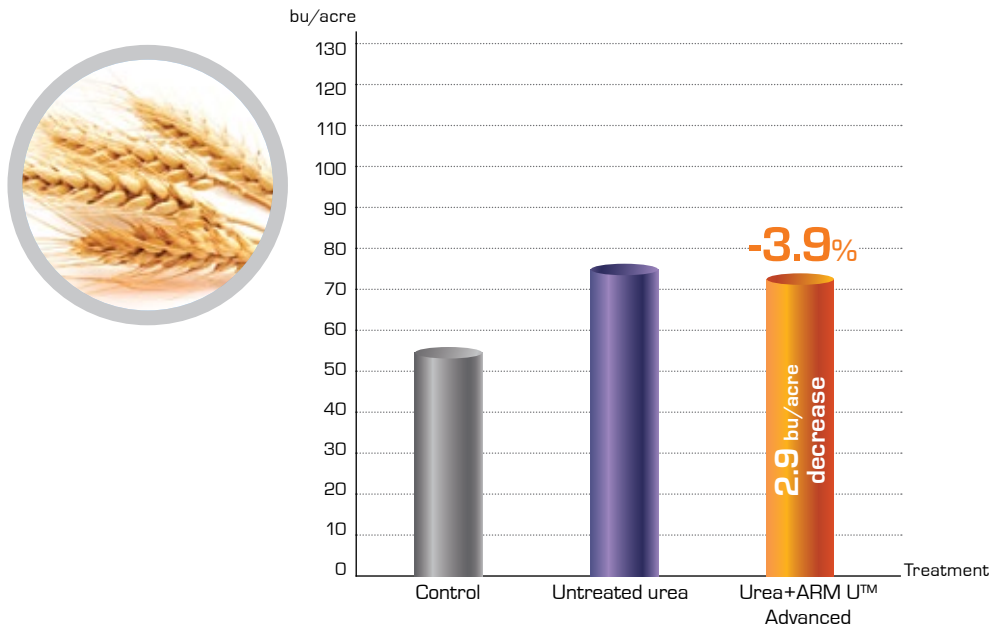




WHEAT • PORTAGE MANITOBA Fall applied UREA + ARM U™ ADVANCED

Cumulative ammonia volatilization loss

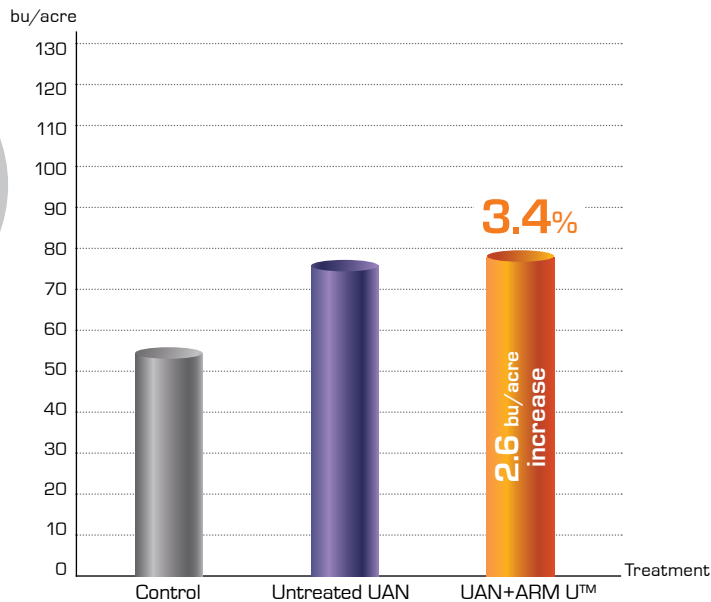
| Cumulative ammonia volatilization loss (kg N/ha) | Day 0-7 | Day 14-21 | Total | % reduction | Yield (bu/acre) | % change |
|---|---------|-----------|-------|-------------|-----------------|----------|
| Control (without urea and UAN) | 0.4 | 0.1 | 0.5 | | 53.4 | |
| Untreated urea @ 100 kg N/ha | 8.0 | 4.1 | 12.1 | | 73.9 | |
| Urea coated with ARM U™ Advanced (1.5 L/1000 kg rate) @ 100 kg N/ha | 1.1 | 2.1 | 3.2 | 73.0 | 71.0 | -3.9 |



WHEAT • PORTAGE MANITOBA Fall applied UAN + ARM U™

Cumulative ammonia volatilization loss

| Cumulative ammonia volatilization loss (kg N/ha) | Day 0-7 | Day 14-21 | Total | % reduction | Yield (bu/acre) | % change |
|--|---------|-----------|-------|-------------|-----------------|----------|
| Control (without urea and UAN) | 0.4 | 0.1 | 0.5 | | 53.4 | |
| Untreated UAN @ 100 kg N/ha | 7.3 | 3.0 | 10.3 | | 76.9 | |
| UAN mixed with ARM U™ (1.5 L/1000 L rate) @ 100 kg N/ha | 2.2 | 3.3 | 5.5 | 46.0 | 79.5 | 3.4 |
| UAN + Commercial Product (1.5 L/1000 L rate) @ 100 kg N/ha | 1.8 | 3.5 | 5.3 | 49.0 | 84.3 | 9.6 |

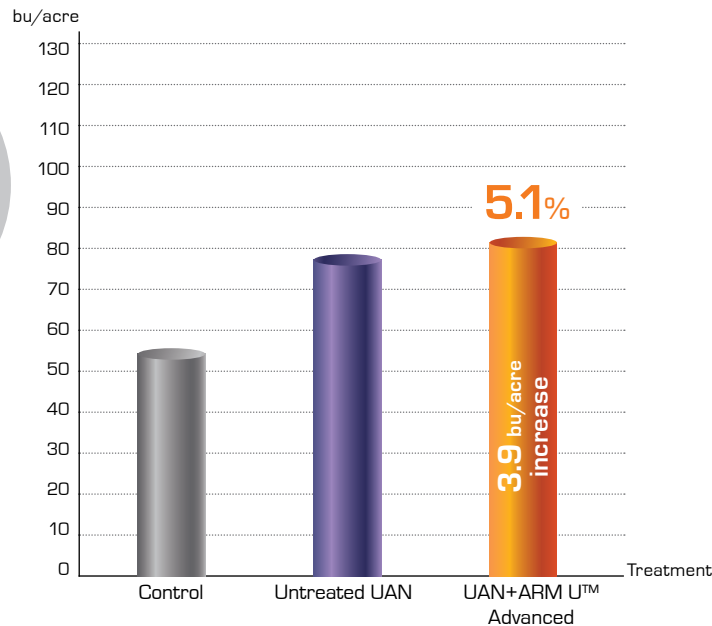




WHEAT • PORTAGE MANITOBA Fall applied UAN + ARM U™ ADVANCED

Cumulative ammonia volatilization loss

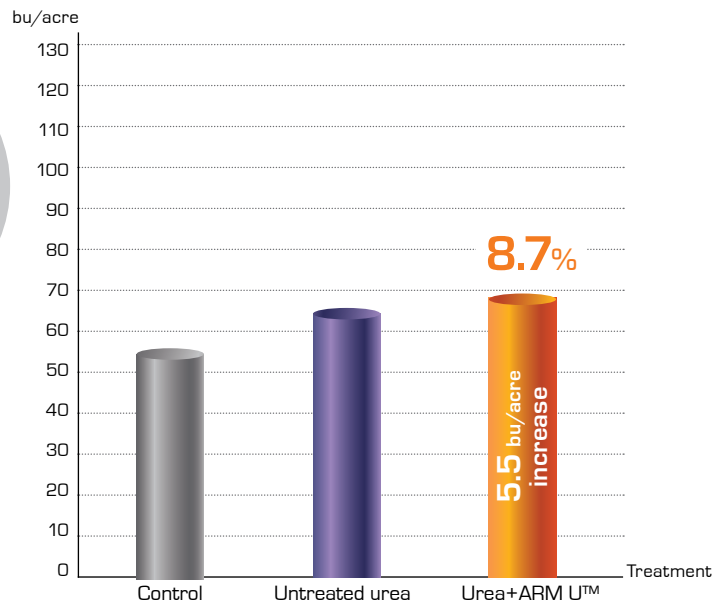
| Cumulative ammonia volatilization loss (kg N/ha) | Day 0-7 | Day 14-21 | Total | % reduction | Yield (bu/acre) | % change |
|--|---------|-----------|-------|-------------|-----------------|----------|
| Control (without urea and UAN) | 0.4 | 0.1 | 0.5 | | 53.4 | |
| Untreated urea @ 100 kg N/ha | 7.3 | 3.0 | 10.3 | | 76.9 | |
| UAN mixed with ARM U™ Advanced (1.5 L/1000 L rate) @ 100 kg N/ha | 1.9 | 3.2 | 5.1 | 51.0 | 80.8 | 5.1 |



CANOLA • PORTAGE MANITOBA Fall applied UREA + ARM U™

Cumulative ammonia volatilization loss

| Cumulative ammonia volatilization loss (kg N/ha) | Day 0-7 | Day 14-21 | Total | % reduction | Yield (bu/acre) | % change |
|--|---------|-----------|-------|-------------|-----------------|----------|
| Control (without urea and UAN) | 0.3 | 0.5 | 0.8 | | 50.4 | |
| Untreated urea @ 100 kg N/ha | 6.8 | 10.5 | 17.8 | | 63.0 | |
| Urea coated with ARM U™ (2 L/1000 kg rate) @ 100 kg N/ha | 1.0 | 2.0 | 3.0 | 83.0 | 68.5 | 8.7 |
| Urea + Commercial Product (2 L/1000 kg rate) @ 100 kg N/ha | 1.3 | 1.7 | 3.0 | 83.0 | 66.4 | 5.4 |

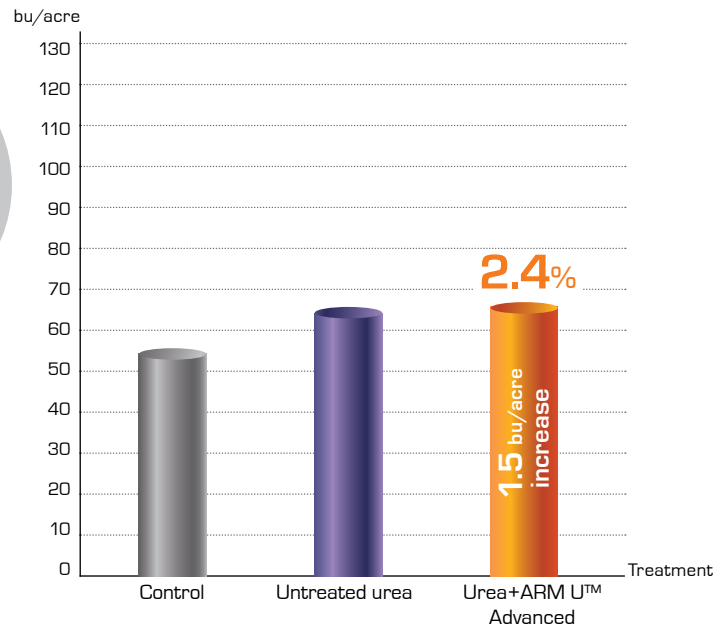




CANOLA • PORTAGE MANITOBA Fall applied UREA + ARM U™ ADVANCED

Cumulative ammonia volatilization loss

| Cumulative ammonia volatilization loss (kg N/ha) | Day 0-7 | Day 14-21 | Total | % reduction | Yield (bu/acre) | % change |
|---|---------|-----------|-------|-------------|-----------------|----------|
| Control (without urea and UAN) | 0.3 | 0.5 | 0.8 | | 50.4 | |
| Untreated urea @ 100 kg N/ha | 6.8 | 10.5 | 17.3 | | 63.0 | |
| Urea coated with ARM U™ Advanced (1.5 L/1000 kg rate) @ 100 kg N/ha | 1.6 | 3.2 | 4.8 | 72.0 | 64.5 | 2.4 |

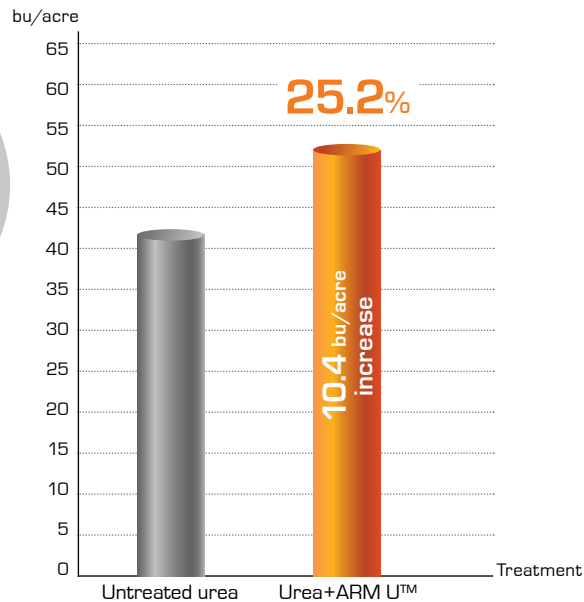




WHEAT • CARMAN MANITOBA Spring applied UREA + ARM U™

Cumulative ammonia volatilization losses [% of applied N] and Yield

| Treatment | Day 0-7 | Day 14-28 | Total | % reduction | Yield (bu/acre) | % change |
|---|---------|-----------|-------|-------------|-----------------|----------|
| Untreated urea @ 100 kg N/ha | 17.5 | 1.4 | 18.9 | | 41.3 | |
| Urea coated with ARM U™ (2 L/1000 kg rate) @ 100 kg N/ha | 0.4 | 5.4 | 5.8 | 69.0 | 51.7 | 25.2 |

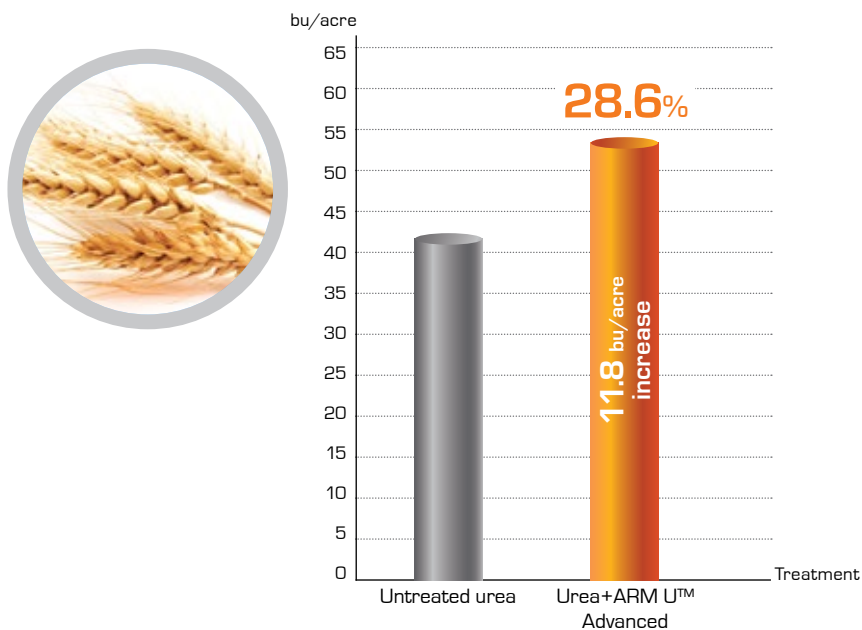




WHEAT • CARMAN MANITOBA Spring applied UREA + ARM U™ ADVANCED

Cumulative ammonia volatilization losses [% of applied N] and Yield

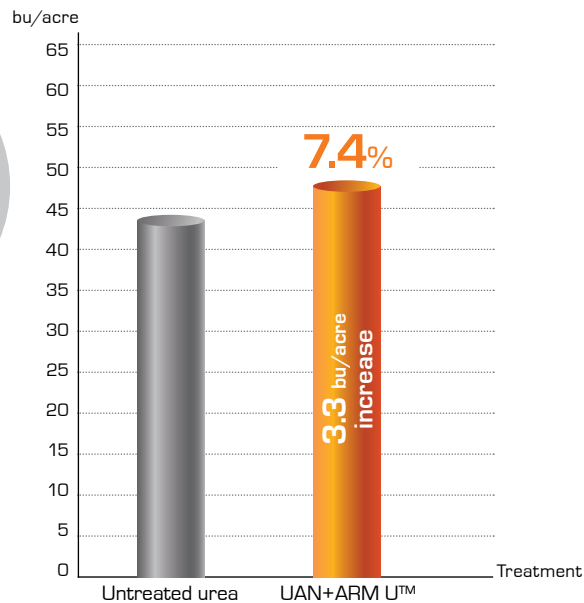
| Treatment | Day 0-7 | Day 14-28 | Total | % reduction | Yield (bu/acre) | % change |
|---|---------|-----------|-------|-------------|-----------------|----------|
| Untreated urea @ 100 kg N/ha | 17.5 | 1.4 | 18.9 | | 41.3 | |
| Urea coated with ARM U™ Advanced (1.5 L/1000 kg rate) @ 100 kg N/ha | 5.8 | 2.7 | 8.5 | 55.0 | 53.1 | 28.6 |



WHEAT • CARMAN MANITOBA Spring applied UAN + ARM U™

Cumulative ammonia volatilization losses [% of applied N] and Yield

| Treatment | Day 0-7 | Day 14-28 | Total | % reduction | Yield (bu/acre) | % change |
|--|---------|-----------|-------|-------------|-----------------|----------|
| Untreated UAN @ 75 kg N/ha | 2.0 | 1.1 | 3.1 | | 44.3 | |
| UAN + ARM U™ (1.5 L/1000 L rate) @ 75 kg N/ha | 0.4 | 0.9 | 1.3 | 58.0 | 47.6 | 7.4 |

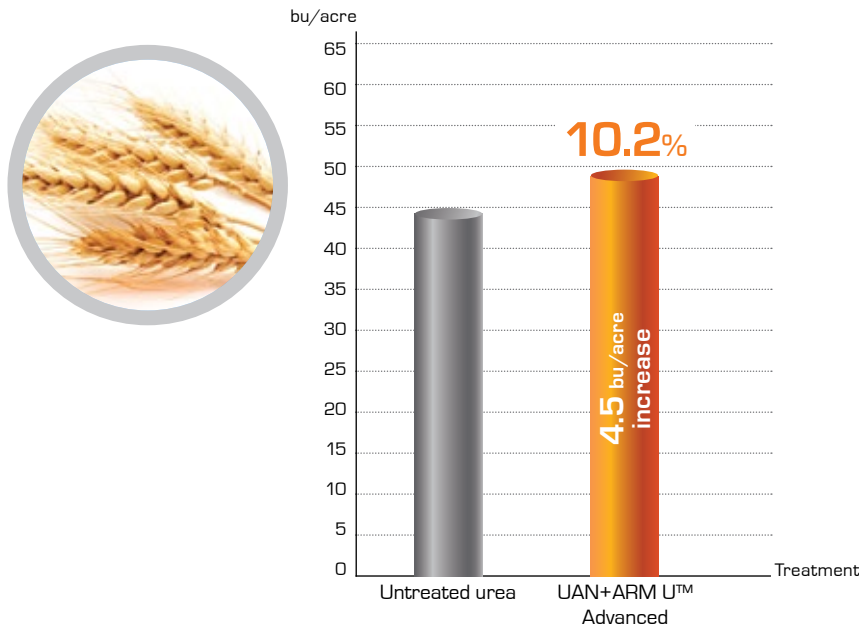




WHEAT • CARMAN MANITOBA Spring applied UAN + ARM U™ ADVANCED

Cumulative ammonia volatilization losses [% of applied N] and Yield

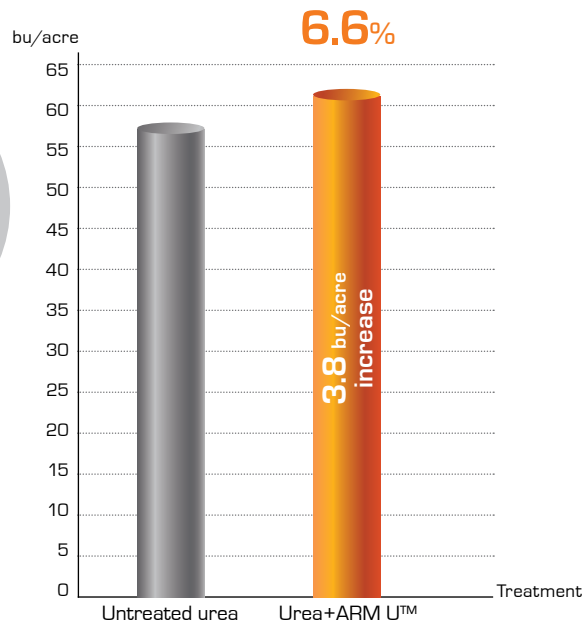
| Treatment | Day 0-7 | Day 14-28 | Total | % reduction | Yield (bu/acre) | % change |
|---|---------|-----------|-------|-------------|-----------------|----------|
| Untreated UAN @ 75 kg N/ha | 2.0 | 1.1 | 3.1 | | 44.3 | |
| UAN + ARM U™ Advanced (1.5 L/1000 L rate) @ 75 kg N/ha | 0.9 | 1.0 | 1.9 | 38.0 | 48.8 | 10.2 |



CANOLA • CARMAN MANITOBA Spring applied UREA + ARM U™

Cumulative ammonia volatilization losses [% of applied N] and Yield

| Treatment | Day 0-7 | Day 14-28 | Total | % reduction | Yield (bu/acre) | % change |
|---|---------|-----------|-------|-------------|-----------------|----------|
| Untreated urea @ 100 kg N/ha | 21.9 | 1.0 | 23.3 | | 57.2 | |
| Urea + ARM U™ (2 L/1000 kg rate) @ 100 kg N/ha | 1.5 | 4.9 | 6.4 | 73.0 | 61.0 | 6.6 |

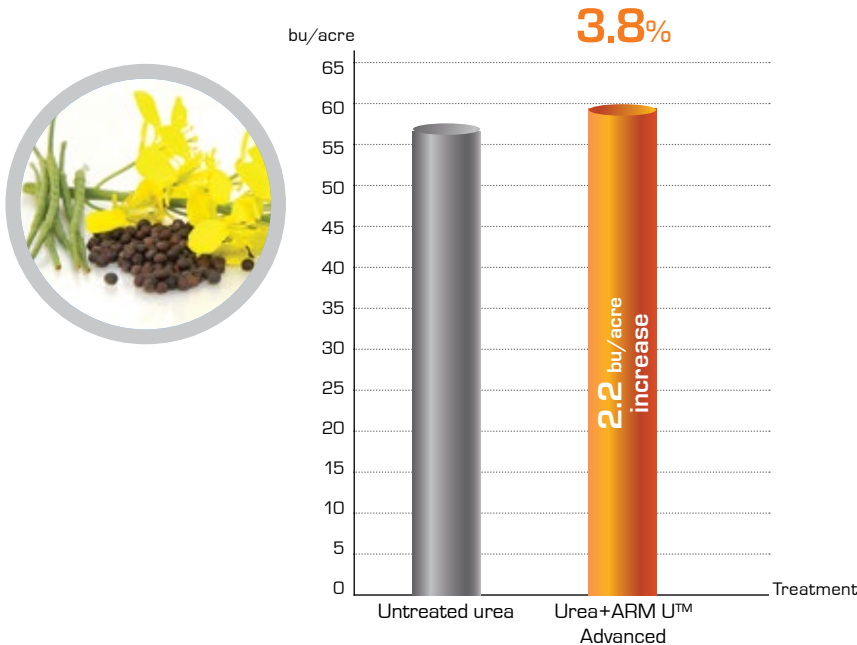




CANOLA • CARMAN MANITOBA Spring applied UREA + ARM U™ ADVANCED

Cumulative ammonia volatilization losses [% of applied N] and Yield

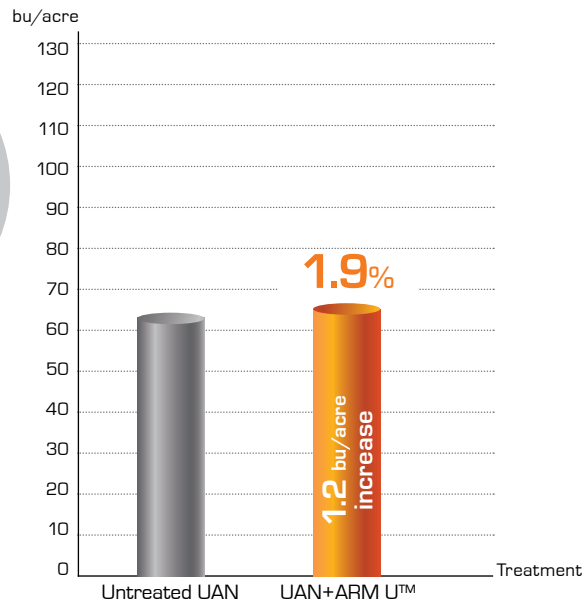
| Treatment | Day 0-7 | Day 14-28 | Total | % reduction | Yield (bu/acre) | % change |
|--|---------|-----------|-------|-------------|-----------------|----------|
| Untreated urea @ 100 kg N/ha | 21.9 | 1.0 | 23.3 | | 57.2 | |
| Urea + ARM U™ Advanced (1.5 L/1000 L rate) @ 75 kg N/ha | 5.3 | 1.9 | 7.2 | 46.0 | 59.4 | 3.8 |



CANOLA • CARMAN MANITOBA Spring applied UAN + ARM U™

Cumulative ammonia volatilization losses [% of applied N] and Yield

| Treatment | Day 0-7 | Day 14-28 | Total | % reduction | Yield (bu/acre) | % change |
|--|---------|-----------|-------|-------------|-----------------|----------|
| Untreated UAN @ 75 kg N/ha | 2.1 | 0.9 | 3.0 | | 63.1 | |
| UAN + ARM U™ (1.5 L/1000 L rate) @ 75 kg N/ha | 0.5 | 4.6 | 5.1 | -70.0 | 64.3 | 1.9 |

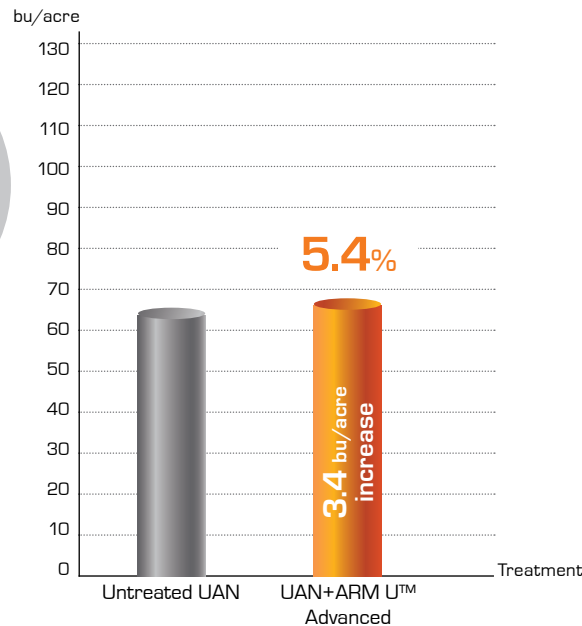




CANOLA • CARMAN MANITOBA Spring applied UAN + ARM U™ ADVANCED

Cumulative ammonia volatilization losses [% of applied N] and Yield

| Treatment | Day 0-7 | Day 14-28 | Total | % reduction | Yield (bu/acre) | % change |
|---|---------|-----------|-------|-------------|-----------------|----------|
| Untreated UAN @ 75 kg N/ha | 2.1 | 0.9 | 3.0 | | 63.1 | |
| UAN + ARM U™ Advanced (1.5 L/1000 L rate) @ 75 kg N/ha | 0.8 | 3.5 | 4.3 | -43.3 | 66.5 | 5.4 |

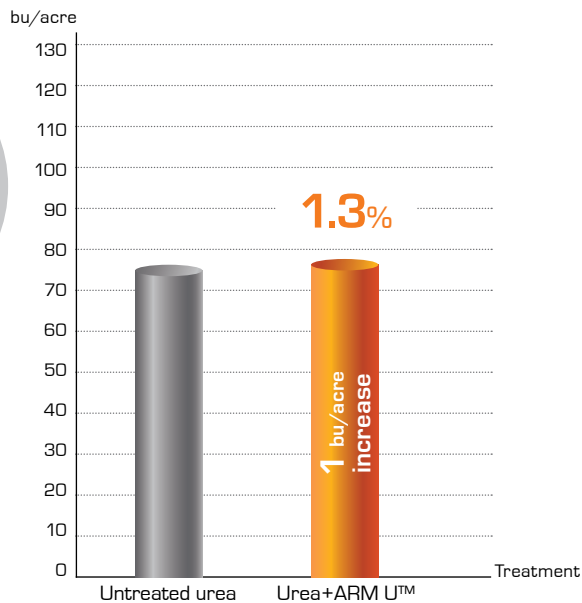




WHEAT • PORTAGE MANITOBA Spring applied UREA + ARM U™

Cumulative ammonia volatilization losses [% of applied N] and Yield

| Treatment | Day 0-7 | Day 14-28 | Total | % reduction | Yield (bu/acre) | % change |
|---|---------|-----------|-------|-------------|-----------------|----------|
| Untreated urea @ 100 kg N/ha | 10.2 | 10.2 | 20.4 | | 74.7 | |
| Urea coated with ARM U™ (2 L/1000 kg rate) @ 100 kg N/ha | 0.9 | 6.7 | 7.6 | 63.0 | 75.7 | 1.3 |

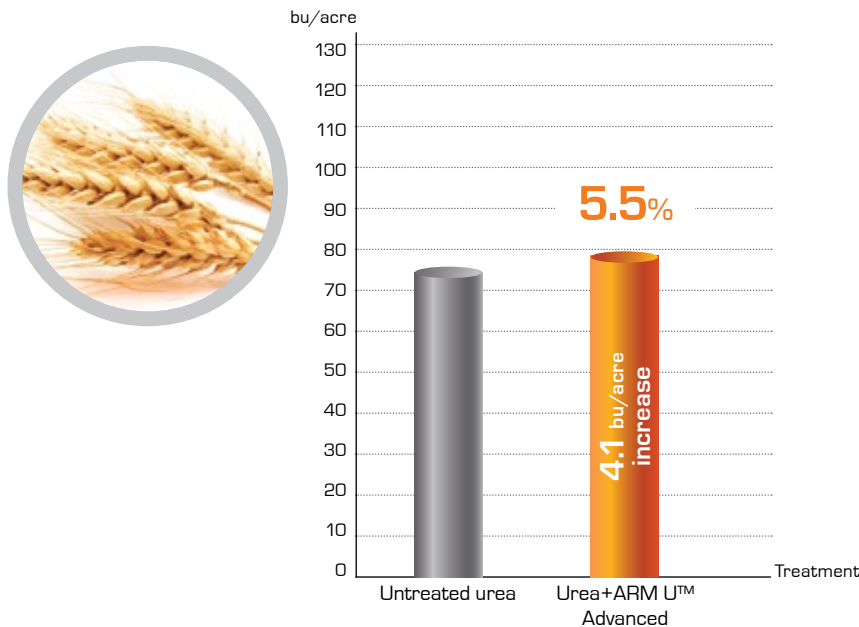




WHEAT • PORTAGE MANITOBA Spring applied UREA + ARM U™ ADVANCED

Cumulative ammonia volatilization losses [% of applied N] and Yield

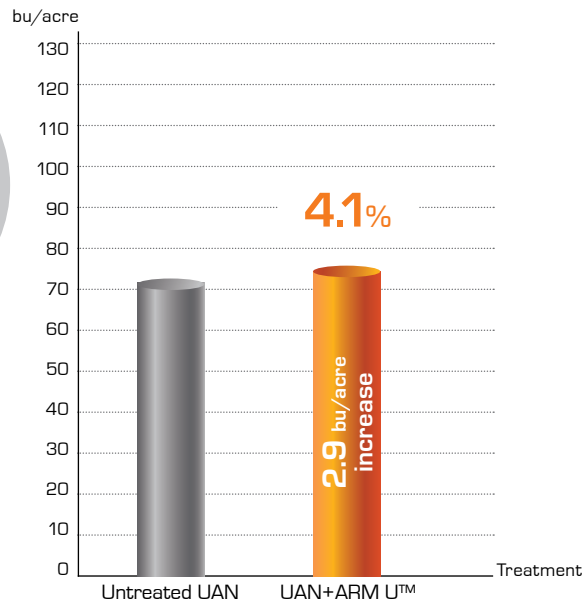
| Treatment | Day 0-7 | Day 14-28 | Total | % reduction | Yield (bu/acre) | % change |
|--|---------|-----------|-------|-------------|-----------------|----------|
| Untreated urea @ 100 kg N/ha | 10.2 | 10.2 | 20.4 | | 74.7 | |
| Urea coated with ARM U™ Advanced (1.5 L/1000 kg rate) @ 75 kg N/ha | 2.3 | 10.3 | 12.6 | 56.0 | 78.8 | 5.5 |



WHEAT • PORTAGE MANITOBA Spring applied UAN + ARM U™

Cumulative ammonia volatilization losses [% of applied N] and Yield

| Treatment | Day 0-7 | Day 14-28 | Total | % reduction | Yield (bu/acre) | % change |
|--|---------|-----------|-------|-------------|-----------------|----------|
| Untreated UAN @ 75 kg N/ha | 5.4 | 8.5 | 13.9 | | 70.2 | |
| UAN + ARM U™ (1.5 L/1000 L rate) @ 75 kg N/ha | 2.3 | 9.0 | 11.3 | 19.0 | 73.1 | 4.1 |

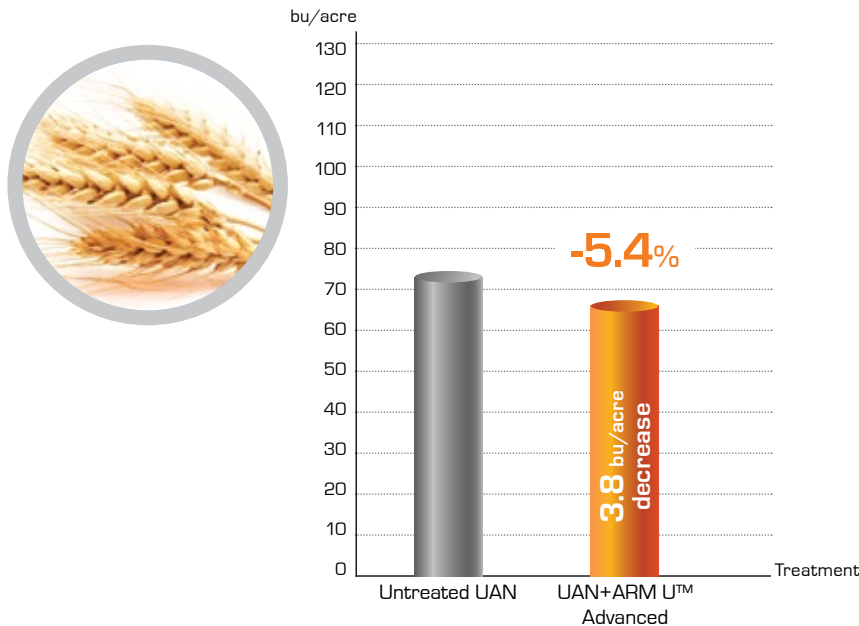




WHEAT • PORTAGE MANITOBA Spring applied UAN + ARM U™ ADVANCED

Cumulative ammonia volatilization losses [% of applied N] and Yield

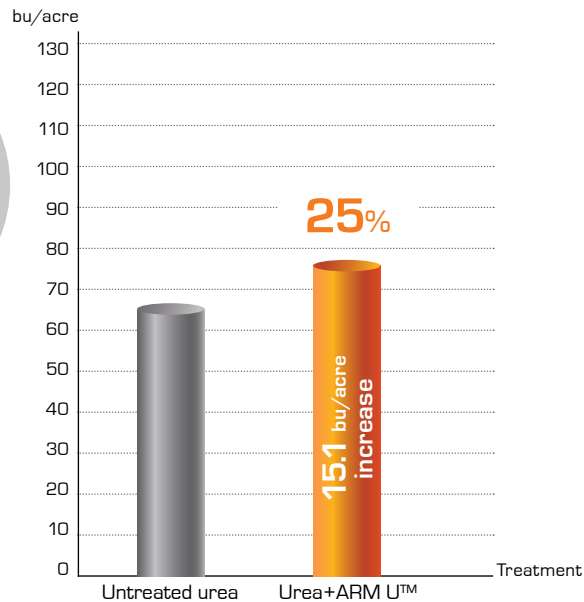
| Treatment | Day 0-7 | Day 14-28 | Total | % reduction | Yield (bu/acre) | % change |
|---|---------|-----------|-------|-------------|-----------------|----------|
| Untreated UAN @ 75 kg N/ha | 5.4 | 8.5 | 13.9 | | 70.2 | |
| UAN + ARM U™ Advanced (1.5 L/1000 L rate) @ 75 kg N/ha | 2.8 | 13.3 | 16.1 | -16.0 | 66.4 | -5.4 |



CANOLA • PORTAGE MANITOBA Spring applied UREA + ARM U™

Cumulative ammonia volatilization losses [% of applied N] and Yield

| Treatment | Day 0-7 | Day 14-28 | Total | % reduction | Yield (bu/acre) | % change |
|---|---------|-----------|-------|-------------|-----------------|----------|
| Untreated urea @ 100 kg N/ha | 5.2 | 21.9 | 27.1 | | 60.4 | |
| Urea + ARM U™ (2 L/1000 kg rate) @ 100 kg N/ha | 1.0 | 13.8 | 14.8 | 45.0 | 75.5 | 25.0 |

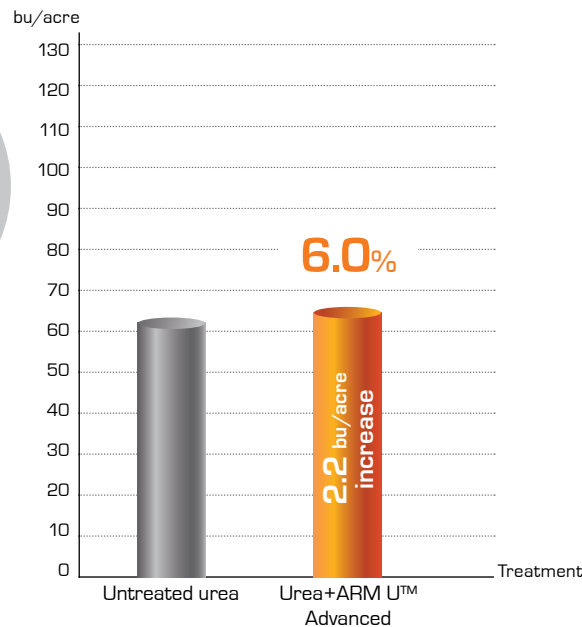




CANOLA • PORTAGE MANITOBA Spring applied UREA + ARM U™ ADVANCED

Cumulative ammonia volatilization losses [% of applied N] and Yield

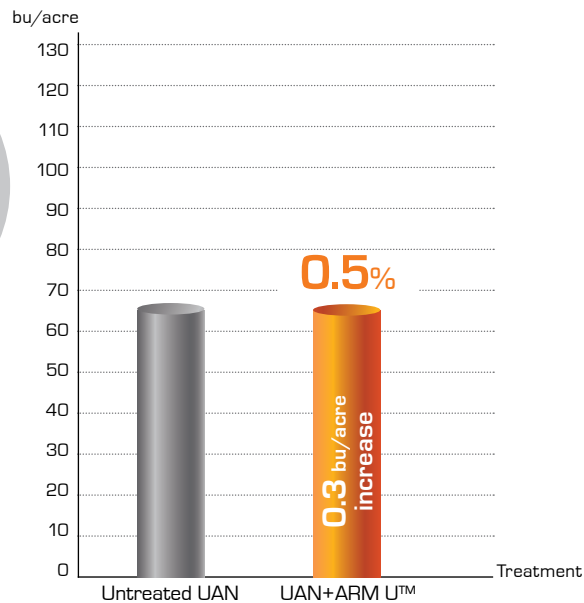
| Treatment | Day 0-7 | Day 14-28 | Total | % reduction | Yield (bu/acre) | % change |
|--|---------|-----------|-------|-------------|-----------------|----------|
| Untreated urea @ 100 kg N/ha | 5.2 | 21.9 | 27.1 | | 60.4 | |
| Urea + ARM U™ Advanced (1.5 L/1000 L rate) @ 75 kg N/ha | 1.3 | 17.1 | 18.4 | 37.0 | 64.0 | 6.0 |



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Cumulative ammonia volatilization losses [% of applied N] and Yield

| Treatment | Day 0-7 | Day 14-28 | Total | % reduction | Yield (bu/acre) | % change |
|--|---------|-----------|-------|-------------|-----------------|----------|
| Untreated UAN @ 75 kg N/ha | 3.0 | 10.8 | 13.8 | | 65.9 | |
| UAN + ARM U™ (1.5 L/1000 L rate) @ 75 kg N/ha | 1.3 | 10.3 | 11.6 | 16.0 | 66.2 | 0.5 |

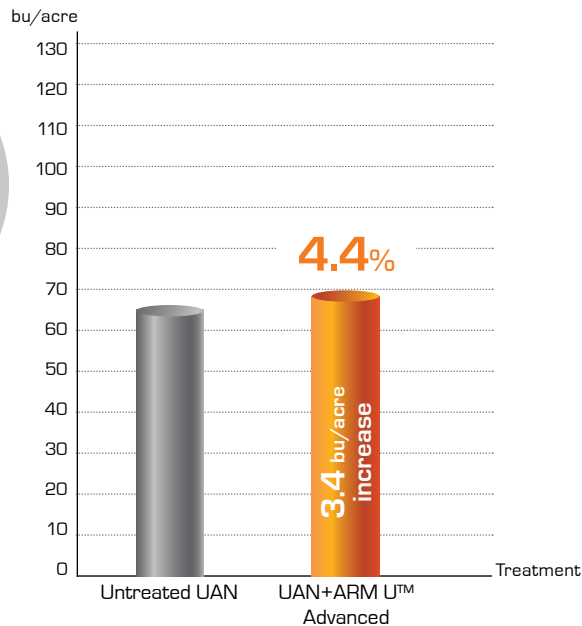




CANOLA • PORTAGE MANITOBA Spring applied UAN + ARM U™ ADVANCED

Cumulative ammonia volatilization losses (% of applied N) and Yield

| Treatment | Day 0-7 | Day 14-28 | Total | % reduction | Yield (bu/acre) | % change |
|--|---------|-----------|-------|-------------|-----------------|----------|
| Untreated UAN @ 75 kg N/ha | 3.0 | 10.8 | 13.8 | | 65.9 | |
| UAN + ARM U™ Advanced (1.5 L/1000 L rate) @ 75 kg N/ha | 2.4 | 9.9 | 12.3 | 11.0 | 68.8 | 4.4 |





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