Timac AGRO
Canada

# CORN SILAGE

## TIMAC AGRO REPORT

Timac AGRO Canada

County: Middlesex
ATC: Leonardo Amancio Lopes

Location: Parkhill

The objective of this trial is to maximize production and profitability per acre with Excelis Maxx, our N stabilizer, minimizing losses, enhancing nutrient availability and stimulation of root development. Our Biostimulation Program seeks to enhance nutrient uptake, intensify chlorophyll production and improve a plant's ability to tolerate abiotic stresses.

## 1 PROTOCOLS

### Control
**6 acres**

| Before sowing | Sowing | 2-4 Leaves | 4-6 Leaves | 6-8 Leaves | 10-12Leaves | Flowering ♂ | Flowering ♀ | Maturation |
|---|---|---|---|---|---|---|---|---|
| 32 gls/ac - UAN 28% | | | | | | | | |

### Timac Agro
**Biostimulant: 6 acres**
**Excelis Maxx: 33 acres**

| Before sowing | Sowing | 2-4 Leaves | 4-6 Leaves | 6-8 Leaves | 10-12Leaves | Flowering ♂ | Flowering ♀ | Maturation |
|---|---|---|---|---|---|---|---|---|
| 0,75 L Excelis Maxx / T 1,5 L Fertiactyl /ac | | | | 1,5 L Fertileader/ac | | | | |

# Corn Silage

## TIMAC AGRO REPORT

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## 2 Follow-Up

Follow-up is a vital part of the process. This allows us to evaluate the physiological response of the crop during the various growth stages after the treatment of each protocol. **The crop responded very well, as seen in the photos below**. It is a strong indication of what to expect in terms of production.

Average of 1 visit every 20 days.
(From Fertilizer Application to Harvest)


05-21-2020


06-26-2020


08-21-2020

09-15-2020




## 3 Silage Analysis

A sample of each area was collected at the harvest day.

# Cumberland Valley Analytical Services

*" Laboratory services for agriculture ... from the field to the feed bunk "*

**Farm:** VAN
**Desc:** 28%

Lab ID: **29179 301**
Sampled: **09/15/2020**
Arrived: **09/16/2020**
Completed: **09/17/2020**
Reported: **09/17/2020**

***28%***

| SAMPLE INFORMATION | | | |
|---|---|---|---|
| Lab ID: | 29179 301 | Version: | 1.0 |
| Crop Year: | | Series: | |
| Feed Type: | CORN SILAGE | Cutting #: | |
| Package: | BASIC NIR | | |

| NIR ANALYSIS RESULTS | |
|---|---|
| Moisture | 67.5 |
| Dry Matter | 32.5 |

| PROTEINS | % SP | % CP | % DM |
|---|---|---|---|
| Crude Protein | | | 8.7 |
| Adjusted Protein | | | |
| Soluble Protein | | 27.0 | 2.4 |
| Ammonia (CPE) | 8.1 | 2.2 | 0.19 |
| ADF Protein (ADICP) | | 10.0 | 0.87 |
| NDF Protein (NDICP) | | 15.5 | 1.35 |
| NDR Protein (NDRCP) | | | |
| Rumen Degr. Protein | | 63.5 | 5.5 |
| Amino Acid Protein, Total | | | |

| FIBER | %NDFom | NDFom %DM | % NDF | % DM |
|---|---|---|---|---|
| ADF | | | 59.4 | 20.0 |
| aNDF | | 33.4 | | 33.7 |
| NDR (NDF w/o sulfite) | | | | |
| Crude Fiber | | | | |
| Lignin | | | 7.55 | 2.54 |
| NDF Digestibility (12 hr) | | | 35.1 | 11.8 |
| NDF Digestibility (24 hr) | | | | |
| NDF Digestibility (30 hr) | 65.1 | 21.7 | 64.3 | 21.6 |
| NDF Digestibility (72 hr) | | | | |
| NDF Digestibility (120 hr) | 77.9 | 26.0 | 77.0 | 25.9 |
| NDF Digestibility (240 hr) | 81.2 | 27.1 | 80.3 | 27.0 |
| uNDF (12 hr) | | | | |
| uNDF (30 hr) | 35.0 | 11.7 | 35.7 | 12.0 |
| uNDF (120 hr) | 22.1 | 7.4 | 23.0 | 7.7 |
| uNDF (240 hr) | 18.8 | 6.3 | 19.7 | 6.6 |

| CARBOHYDRATES | % Starch | % NFC | % DM |
|---|---|---|---|
| Silage Acids | | 3.6 | 1.9 |
| Ethanol Soluble CHO (ESC-Sugar) | | 3.1 | 1.7 |
| Water Soluble CHO (WSC-Sugar) | | | 8.0 |
| Starch | | 74.7 | 40.3 |
| Soluble Starch | | | |
| Soluble Fiber | | 20.2 | 10.9 |
| Starch Dig. (7 hr, 4 mm) | 63.6 | | |
| Crude Fat | | | 2.61 |
| Fatty Acids, Total | | | 2.22 |
| C16:0 | | | 0.44 |
| C18:0 | | | 0.07 |
| C18:1 | | | 0.65 |
| C18:2 | | | 1.06 |
| C18:3 | | | 0.07 |
| Unsaturated Fatty Acids (RUFAL) | | | 1.78 |
| Fatty Acids (%Fat) | | | 85.1 |

**Values in bold were analyzed by wet chemistry methods.**

| MINERALS | |
|---|---|
| Ash (%DM) | 2.37 |
| Calcium (%DM) | 0.19 |
| Phosphorus (%DM) | 0.20 |
| Magnesium (%DM) | 0.13 |
| Potassium (%DM) | 0.69 |
| Sulfur (%DM) | 0.10 |
| Sodium (%DM) | |
| Chloride (%DM) | |
| Iron (PPM) | |
| Manganese (PPM) | |
| Zinc (PPM) | |
| Copper (PPM) | |
| Molybdenum (PPM) | |

| QUALITATIVE | |
|---|---|
| pH | 4.20 |
| Total VFA (%DM) | 1.92 |
| Lactic Acid (%DM) | 0.30 |
| Lactic as % of Total VFA | 16 |
| Acetic Acid (%DM) | 1.62 |
| Butyric Acid (%DM) | |
| 1, 2 Propanediol (%DM) | 0.12 |
| Nitrate Ion (%DM) | |

| | |
|---|---|
| Soil Contamination Probability | |
| Nitrate Probability | Probable low nitrate level |
| NIR Statistical Confidence | Good prediction potential |

| ENERGY & INDEX CALCULATIONS | |
|---|---|
| TDN (%DM) | 75.5 |
| Net Energy Lactation (Mcal/lb) | 0.78 |
| Net Energy Maintenance (Mcal/lb) | 0.89 |
| Net Energy Gain (Mcal/lb) | 0.59 |
| ME (Mcal/lb) | 1.32 |
| AA Protein as % of Total Protein | |
| NDF Dig. Rate (Kd, %HR, Van Amburgh, Lignin*2.4) | 4.66 |
| NDF Dig. Rate (Kd, %HR, uNDF) | 4.7 |
| Starch Dig. Rate (Kd, %HR, Mertens) | 15.2 |
| Relative Feed Value (RFV) | |
| Relative Forage Quality (RFQ) | |
| Milk per Ton (lbs/ton) | 3809 |
| Dig. Organic Matter Index (lbs/ton) | |
| Non Fiber Carbohydrates (%DM) | 54.0 |
| Non Structural Carbohydrates (%DM) | 42.0 |
| DCAD (meq/100gdm) | |
| RFC - Fill Index | 5.12 |
| Summative Index % (Mass Balance) | 101.1 |

Additional sample information, submitted documents and lab pictures linked to QR code

2020 Certified

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4999 Zane A. Miller Drive, Waynesboro, PA 17268
www.foragelab.com | mail@foragelab.com | 301-790-1980 | 800-CVAS-LAB




## 3 Silage Analysis

A sample of each area was collected at the harvest day.

**CUMBERLAND VALLEY ANALYTICAL SERVICES**

*" Laboratory services for agriculture ... from the field to the feed bunk "*

CVAS

**Farm:** VAN
**Desc:** 28% + E.M + BIOSTIM

Lab ID: 29179 303
Sampled: 09/15/2020
Arrived: 09/16/2020
Completed: 09/17/2020
Reported: 09/17/2020

***28% + E.M + BIOSTIM***

| SAMPLE INFORMATION | | | |
|---|---|---|---|
| Lab ID: | 29179 303 | Version: | 1.0 |
| Crop Year: | | Series: | |
| Feed Type: | CORN SILAGE | Cutting#: | |
| Package: | BASIC NIR | | |

| NIR ANALYSIS RESULTS | |
|---|---|
| Moisture | 66.2 |
| Dry Matter | 33.8 |

| PROTEINS | % SP | % CP | % DM |
|---|---|---|---|
| Crude Protein | | | 8.8 |
| Adjusted Protein | | | |
| Soluble Protein | | 27.6 | 2.4 |
| Ammonia (CPE) | 8.3 | 2.3 | 0.20 |
| ADF Protein (ADICP) | | 9.8 | 0.86 |
| NDF Protein (NDICP) | | 15.2 | 1.33 |
| NDR Protein (NDRCP) | | | |
| Rumen Degr. Protein | | 63.8 | 5.6 |
| Amino Acid Protein, Total | | | |

| FIBER | %NDFom | NDFom %DM | % NDF | % DM |
|---|---|---|---|---|
| ADF | | | 60.3 | 18.7 |
| aNDF | | 30.6 | | 30.9 |
| NDR (NDF w/o sulfite) | | | | |
| Crude Fiber | | | | |
| Lignin | | | 7.66 | 2.37 |
| NDF Digestibility (12 hr) | | | 34.0 | 10.5 |
| NDF Digestibility (24 hr) | | | | |
| NDF Digestibility (30 hr) | 64.7 | 19.8 | 64.2 | 19.9 |
| NDF Digestibility (72 hr) | | | | |
| NDF Digestibility (120 hr) | 77.8 | 23.8 | 76.9 | 23.8 |
| NDF Digestibility (240 hr) | 81.1 | 24.8 | 80.2 | 24.8 |
| uNDF (12 hr) | | | | |
| uNDF (30 hr) | 35.3 | 10.8 | 35.8 | 11.1 |
| uNDF (120 hr) | 22.2 | 6.8 | 23.1 | 7.1 |
| uNDF (240 hr) | 18.9 | 5.8 | 19.8 | 6.1 |

| CARBOHYDRATES | % Starch | % NFC | % DM |
|---|---|---|---|
| Silage Acids | | 3.4 | 1.9 |
| Ethanol Soluble CHO (ESC-Sugar) | | 2.6 | 1.5 |
| Water Soluble CHO (WSC-Sugar) | | | 6.8 |
| Starch | | 77.4 | 43.7 |
| Soluble Starch | | | |
| Soluble Fiber | | 19.1 | 10.8 |
| Starch Dig. (7 hr, 4 mm) | 62.9 | | |
| Crude Fat | | | 2.77 |
| Fatty Acids, Total | | | 2.44 |
| C16:0 | | | 0.47 |
| C18:0 | | | 0.08 |
| C18:1 | | | 0.73 |
| C18:2 | | | 1.23 |
| C18:3 | | | 0.05 |
| Unsaturated Fatty Acids (RUFAL) | | | 2.01 |
| Fatty Acids (%Fat) | | | 88.1 |

**Values in bold were analyzed by wet chemistry methods.**

| MINERALS | |
|---|---|
| Ash (%DM) | 2.34 |
| Calcium (%DM) | 0.18 |
| Phosphorus (%DM) | 0.21 |
| Magnesium (%DM) | 0.12 |
| Potassium (%DM) | 0.71 |
| Sulfur (%DM) | 0.10 |
| Sodium (%DM) | |
| Chloride (%DM) | |
| Iron (PPM) | |
| Manganese (PPM) | |
| Zinc (PPM) | |
| Copper (PPM) | |
| Molybdenum (PPM) | |

| QUALITATIVE | |
|---|---|
| pH | 4.20 |
| Total VFA (%DM) | 1.91 |
| Lactic Acid (%DM) | 0.46 |
| Lactic as % of Total VFA | 24 |
| Acetic Acid (%DM) | 1.45 |
| Butyric Acid (%DM) | |
| 1, 2 Propanediol (%DM) | 0.48 |
| Nitrate Ion (%DM) | |
| Soil Contamination Probability | |
| Nitrate Probability | Probable low nitrate level |
| NIR Statistical Confidence | Good prediction potential |

| ENERGY & INDEX CALCULATIONS | |
|---|---|
| TDN (%DM) | 76.8 |
| Net Energy Lactation (Mcal/lb) | 0.80 |
| Net Energy Maintenance (Mcal/lb) | 0.91 |
| Net Energy Gain (Mcal/lb) | 0.61 |
| ME (Mcal/lb) | 1.35 |
| AA Protein as % of Total Protein | |
| NDF Dig. Rate (Kd, %HR, Van Amburgh, Lignin*2.4) | 4.68 |
| NDF Dig. Rate (Kd, %HR, uNDF) | 4.7 |
| Starch Dig. Rate (Kd, %HR, Mertens) | 15.0 |
| Relative Feed Value (RFV) | |
| Relative Forage Quality (RFQ) | |
| Milk per Ton (lbs/ton) | 3815 |
| Dig. Organic Matter Index (lbs/ton) | |
| Non Fiber Carbohydrates (%DM) | 56.5 |
| Non Structural Carbohydrates (%DM) | 45.2 |
| DCAD (meq/100gdm) | |
| RFC - Fill Index | 5.78 |
| Summative Index % (Mass Balance) | 101.6 |

Additional sample information, submitted documents and lab pictures linked to QR code

2020 Certified NIRS NFTA

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## 3 Silage Analysis

A sample of each area was collected at the harvest day.

# Cumberland Valley Analytical Services

*" Laboratory services for agriculture ... from the field to the feed bunk "*

**Farm:** VAN
**Desc:** 28% + E.M

Lab ID: 29179 302
Sampled: 09/15/2020
Arrived: 09/16/2020
Completed: 09/17/2020
Reported: 09/17/2020

***28% + E.M***

**SAMPLE INFORMATION**

| | | | |
|---|---|---|---|
| Lab ID: | 29179 302 | Version: | 1.0 |
| Crop Year: | | Series: | |
| Feed Type: | CORN SILAGE | Cutting#: | |
| Package: | BASIC NIR | | |

**NIR ANALYSIS RESULTS**

| | |
|---|---|
| Moisture | 66.5 |
| Dry Matter | 33.5 |

| PROTEINS | % SP | % CP | % DM |
|---|---|---|---|
| Crude Protein | | | 8.5 |
| Adjusted Protein | | | |
| Soluble Protein | | 25.9 | 2.2 |
| Ammonia (CPE) | 7.2 | 1.9 | 0.16 |
| ADF Protein (ADICP) | | 10.0 | 0.85 |
| NDF Protein (NDICP) | | 15.3 | 1.30 |
| NDR Protein (NDRCP) | | | |
| Rumen Degr. Protein | | 63.0 | 5.4 |
| Amino Acid Protein, Total | | | |

| FIBER | %NDFom | NDFom %DM | % NDF | % DM |
|---|---|---|---|---|
| ADF | | | 57.9 | 20.4 |
| aNDF | | 34.9 | | 35.2 |
| NDR (NDF w/o sulfite) | | | | |
| Crude Fiber | | | | |
| Lignin | | | 7.41 | 2.61 |
| NDF Digestibility (12 hr) | | | 33.9 | 11.9 |
| NDF Digestibility (24 hr) | | | | |
| NDF Digestibility (30 hr) | 63.7 | 22.2 | 63.2 | 22.2 |
| NDF Digestibility (72 hr) | | | | |
| NDF Digestibility (120 hr) | 76.3 | 26.6 | 75.7 | 26.6 |
| NDF Digestibility (240 hr) | 79.8 | 27.8 | 78.9 | 27.8 |
| uNDF (12 hr) | | | | |
| uNDF (30 hr) | 36.3 | 12.7 | 36.8 | 13.0 |
| uNDF (120 hr) | 23.7 | 8.3 | 24.3 | 8.6 |
| uNDF (240 hr) | 20.2 | 7.1 | 21.1 | 7.4 |

| CARBOHYDRATES | % Starch | % NFC | % DM |
|---|---|---|---|
| Silage Acids | | 3.1 | 1.7 |
| Ethanol Soluble CHO (ESC-Sugar) | | 2.8 | 1.5 |
| Water Soluble CHO (WSC-Sugar) | | | 8.5 |
| Starch | | 74.5 | 39.6 |
| Soluble Starch | | | |
| Soluble Fiber | | 21.5 | 11.4 |
| Starch Dig. (7 hr, 4 mm) | 63.5 | | |
| Crude Fat | | | 2.53 |
| Fatty Acids, Total | | | 2.08 |
| C16:0 | | | 0.43 |
| C18:0 | | | 0.07 |
| C18:1 | | | 0.63 |
| C18:2 | | | 1.06 |
| C18:3 | | | 0.06 |
| Unsaturated Fatty Acids (RUFAL) | | | 1.75 |
| Fatty Acids (%Fat) | | | 82.2 |

**Values in bold were analyzed by wet chemistry methods.**

| MINERALS | |
|---|---|
| Ash (%DM) | 1.81 |
| Calcium (%DM) | 0.17 |
| Phosphorus (%DM) | 0.20 |
| Magnesium (%DM) | 0.13 |
| Potassium (%DM) | 0.60 |
| Sulfur (%DM) | 0.10 |
| Sodium (%DM) | |
| Chloride (%DM) | |
| Iron (PPM) | |
| Manganese (PPM) | |
| Zinc (PPM) | |
| Copper (PPM) | |
| Molybdenum (PPM) | |

| QUALITATIVE | |
|---|---|
| pH | 4.19 |
| Total VFA (%DM) | 1.66 |
| Lactic Acid (%DM) | 0.29 |
| Lactic as % of Total VFA | 17 |
| Acetic Acid (%DM) | 1.37 |
| Butyric Acid (%DM) | |
| 1, 2 Propanediol (%DM) | 0.04 |
| Nitrate Ion (%DM) | |

| | |
|---|---|
| Soil Contamination Probability | |
| Nitrate Probability | Probable low nitrate level |
| NIR Statistical Confidence | Good prediction potential |

| ENERGY & INDEX CALCULATIONS | |
|---|---|
| TDN (%DM) | 75.4 |
| Net Energy Lactation (Mcal/lb) | 0.78 |
| Net Energy Maintenance (Mcal/lb) | 0.89 |
| Net Energy Gain (Mcal/lb) | 0.59 |
| ME (Mcal/lb) | 1.32 |
| AA Protein as % of Total Protein | |
| NDF Dig. Rate (Kd, %HR, Van Amburgh, Lignin*2.4) | 4.47 |
| NDF Dig. Rate (Kd, %HR, uNDF) | 4.6 |
| Starch Dig. Rate (Kd, %HR, Mertens) | 15.2 |
| Relative Feed Value (RFV) | |
| Relative Forage Quality (RFQ) | |
| Milk per Ton (lbs/ton) | 3731 |
| Dig. Organic Matter Index (lbs/ton) | |
| Non Fiber Carbohydrates (%DM) | 53.2 |
| Non Structural Carbohydrates (%DM) | 41.1 |
| DCAD (meq/100gdm) | |
| RFC - Fill Index | 4.75 |
| Summative Index % (Mass Balance) | 101.3 |

Additional sample information, submitted documents and lab pictures linked to QR code

2020 Certified

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# Corn Silage



Timac AGRO Canada

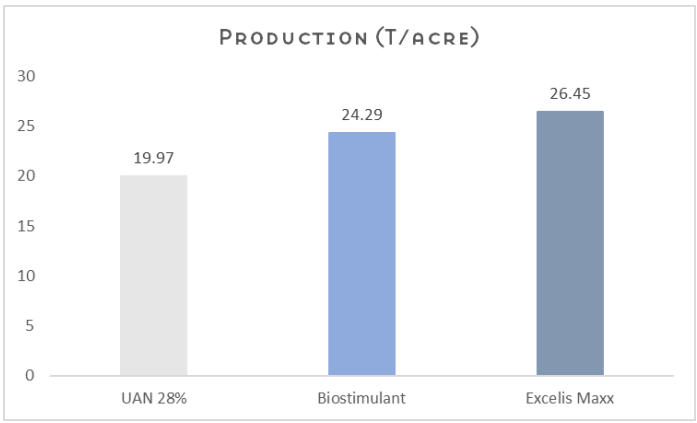
## 4 Results

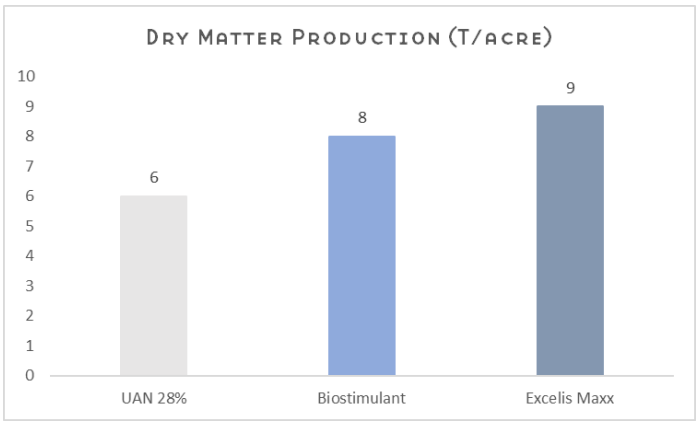
Plant Population/ac: 32,388.66 plants

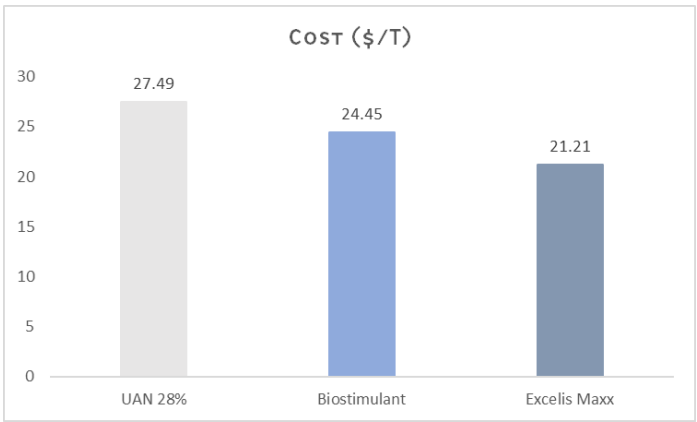
| | UAN 28% | Biostimulant | % | Excelis Maxx | % |
|---|---|---|---|---|---|
| Production (T/acre) | 19.97 | 24.29 | 22% | 26.45 | 32% |
| Dry Matter (%) | 32.5% | 33.8% | | 33.5% | |
| **Dry Matter Production (T/acre)** | **6** | **8** | **26%** | **9** | **37%** |
| Cost of Production ($/acre) | $ 549.00 | $ 549.00 | | $ 549.00 | |
| Product Application Cost ($/acre) | $ - | $ 45.00 | | $ 12.12 | |
| Total cost ($/acre) | $ 549.00 | $ 594.00 | 8% | $ 561.12 | 2% |
| **Cost ($/T)** | **$ 27.49** | **$ 24.45** | **-11%** | **$ 21.21** | **-23%** |

Source: Omafra

Production (ton/acre) was estimated by:
- Collect 30 standard plants per treated area.
- Weight each sample and estimate for the whole area.




With Timac Agro fertilization program, we have **increased production** by 22% with Biostimulation program and 32% with Excelis Maxx, **reducing the cost** by 11% with Biostimulation program and 23% with Excelis Maxx, compared to UAN 28%.

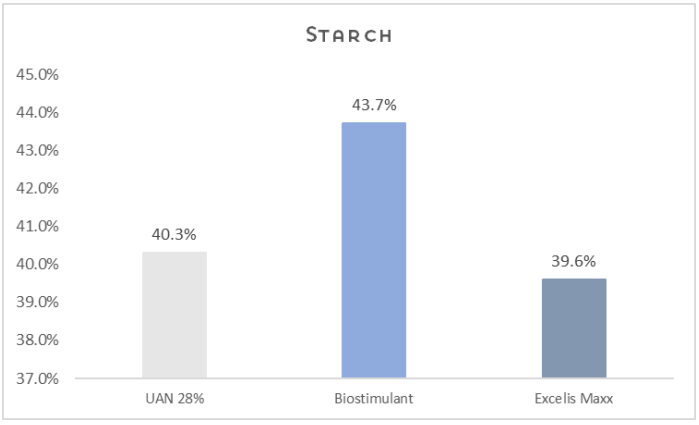
# Corn Silage

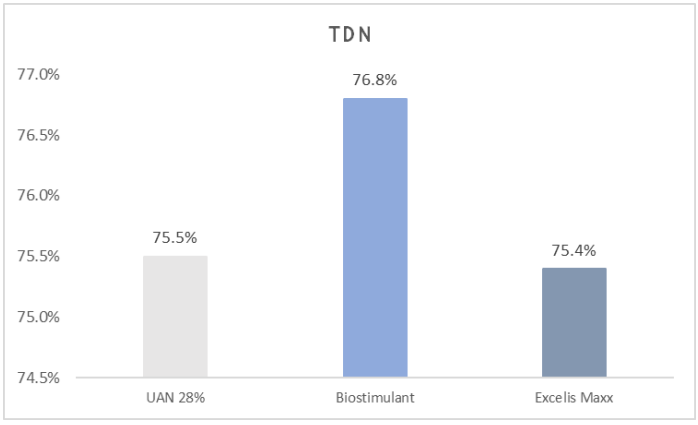


Timac AGRO Canada

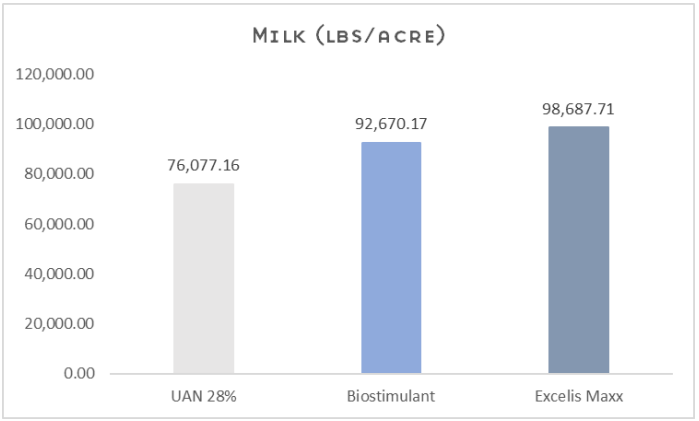
## 4 Results

| | UAN 28% | Biostimulant | % | Excelis Maxx | % |
|---|---|---|---|---|---|
| (Dry Matter basis) | | | | | |
| CP | 8.7% | 8.8% | 1.1% | 8.5% | -2.3% |
| ADF | 20.0% | 18.7% | -6.5% | 20.4% | 2.0% |
| Lignin | 2.5% | 2.4% | -6.7% | 2.6% | 2.8% |
| aNDF | 33.7% | 30.9% | -8.3% | 35.2% | 4.5% |
| NDF digestibility (30 h) | 21.6% | 19.9% | -7.9% | 22.2% | 2.8% |
| Starch | 40.3% | 43.7% | 8.4% | 39.6% | -1.7% |
| Ash | 2.4% | 2.3% | -1.3% | 1.8% | -23.6% |
| Nitrate | ok | ok | | ok | |
| TDN | 75.5% | 76.8% | 1.7% | 75.4% | -0.1% |
| Milk (lbs/T) | 3,809.00 | 3,815.00 | 0.2% | 3,731.00 | -2% |
| **Milk (lbs/acre)** | **76,077.16** | **92,670.17** | **21.8%** | **98,687.71** | **30%** |




The forementioned indicators have the greatest impact on digestibility and production. In general, these numbers are on the average in terms of quality, please pay special attention to the levels of **Starch** and **TDN**, where we can identify the **most significant difference in the biostimulant treatment**.

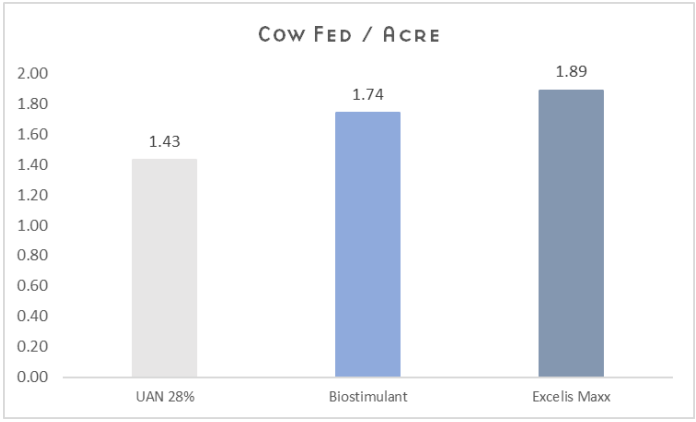



Timac Agro fertilization program increase the efficiency of milk production/acre.



## 4 RESULTS

| | UAN 28% | Biostimulant | % | Excelis Maxx | % |
|---|---|---|---|---|---|
| Corn silage intake (T/cow/year) | 14 | 14 | | 14 | |
| **Cows fed/acre** | **1.43** | **1.74** | **21.6%** | **1.89** | **32%** |




With Timac Agro fertilization program, there is room to intensify production.

Our mission at Timac Agro is at the forefront of everything we do. We strive to **help Canadian farmers improve their production, in pursuit of a sustainable and more profitable agriculture**.

We appreciate the opportunity to be part of this trial!

Leonardo Amancio Lopes
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## 5 NOTES FOR NEXT YEAR