ARCTIC S 11-0-0
WITH 75% SULPHUR
Sulphur Made Easy
NorthernNutrients.com
What is Arctic S

Created by Shell Thiogro Technologies

Micronized Elemental Sulphur evenly dispersed in melted urea

Micronized particle size allows for quick breakdown & conversion from elemental S to plant available S03
ARCTIC S HANDLING
### TECHNICAL FEATURES

**Analysis:**
- 11% Nitrogen
- 75% Elemental Sulphur

**Arctic S Salt index of 17.8**
- Ammonium sulphate: 68.3
- Ammonium thiosulphate: 90.4

### APPLICATION FEATURES

- Blends well with most conventional dry fertilizer
- SGN: 300
- Bulk Density: 62.5 lbs/ft³
- Angle of Repose: 32 Low
- Salt Index: 17.8
SAFETY FEATURES

- Non Hazardous Fertilizer as per OSHA
- Strong prills create a fraction of the dust compared to Sulphur bentonite
  *IFDC test results available on request
- Self extinguishing material- Class 3 compared to Sulphur bentonite which is Class 5 which mitigates fire risk
Benefits

- Low salt index for safer seed placement & improved phos uptake
- Provides a season long source of Sulphur *SNOWBALL EFFECT helping early season availability
- Save time & money with less product to handle.
BENEFITS CONTINUED

Seed row, sideband, MRB and broadcast application

Less prone to caking than Ammonium Sulphate

Less leaching in wet seasons resulting in more S available during pod fill
TECHNICAL FEATURES

PARTICLE SIZE IS KEY TO THE TRANSITION TO SULPHATE

*CONVERSION RATES SUBJECT TO ENVIRONMENTAL & SOIL CONDITIONS

<table>
<thead>
<tr>
<th>Particle Size (microns)</th>
<th>% S Oxidized 2 Weeks</th>
<th>% S Oxidized 4 Weeks</th>
</tr>
</thead>
<tbody>
<tr>
<td>&gt; 2,000</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>840 – 2,000</td>
<td>2</td>
<td>5</td>
</tr>
<tr>
<td>420 – 840</td>
<td>5</td>
<td>14</td>
</tr>
<tr>
<td>180 – 420</td>
<td>15</td>
<td>36</td>
</tr>
<tr>
<td>125 – 180</td>
<td>36</td>
<td>68</td>
</tr>
<tr>
<td>90 – 125</td>
<td>61</td>
<td>81</td>
</tr>
<tr>
<td>60</td>
<td>80</td>
<td>82</td>
</tr>
</tbody>
</table>

| Micron Size Average     | Super S 30-40um      | Sulphur 90 200-300um | Human Hair 80um       |

Degryse et al. 2016

Canola.okstate.edu
CIRRUS TRIALS 2018 – SPECIAL-S OXIDATION (Probe Test)

By applying elemental Sulphur in Micronized form, growers can access the in-season availability of a Sulphate product while reducing the risk of losses through leaching.

Delivering Sulphur when your crops need it most ensures you see a return on your fertilizer investment!

Special-S Oxidation Compared with Crop Need
Measured Using PRS Probes, Crop Uptake Source IPNI

Oxidation test conducted in controlled environment to determine maximum oxidation potential of Special-S. Variable climatic conditions in first 40 days would likely show Special-S availability closer to uptake curves.

May 2019
EXCELLENT FOR BLENDS
When & how to use Arctic S?

- Replacing fields with previous application history of elemental
- Replacing ammonium sulphate fields with adequate fertilization history
- Spring Blended or broadcast with Urea, phosphate, potash as your sole source of sulphur
- Blended with S15, 40 Rock, or Polar 42 for two forms of sulphur
- Blended with Ammonium sulphate

- Strategies to implement from retailers over the last 4 years include:
  - Cold turkey switches from AMS in spring blends
  - First year all sulphur in pulses in cereals with Arctic S and most of canola blends from Arctic S
  - Fall spreading annually with Super U or other Nitrogen for all crops
  - In season top dress alone, with Urea or with Urea and AMS
When to consider a supplemental form of S with Arctic S?

- Field with zero residual Sulphur, such as a converted hayfield or a conventional field that has been severely under fertilized with Sulphur historically
- Expected conditions that would not allow for the dissolving of a phosphate granule could leave undissolved prills of all fertilizers including Arctic S
TISSUE RESULTS ICMS TRIALS 2018 SASKATOON

Bar chart showing Tissue Test %S:
- Super S Side band: 1.25
- Super S Seed Row: 1.23
- Ammonium Sulphate Side band: 1.17
YIELD TRIALS 2020 SASKATOON (PIKE LAKE)
YIELD TRIALS 2018 SWIFT CURRENT

Final Soil $\text{SO}_4$
Swift Current, SK

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Soil $\text{SO}_4$ (kg/ha)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control</td>
<td>15</td>
</tr>
<tr>
<td>AMS</td>
<td>16</td>
</tr>
<tr>
<td>S Bentonite</td>
<td>15</td>
</tr>
<tr>
<td>S Bentonite (SB)</td>
<td>16</td>
</tr>
<tr>
<td>Special S</td>
<td>5</td>
</tr>
<tr>
<td>Special S (SB)</td>
<td>25</td>
</tr>
</tbody>
</table>
Canola Yield Trials 2019 Australia
CORN YIELD TRIALS 2017 IOWA, USA

4. ‘Super S’ Increases Crop Yields
Continuous Sulphur supply increases crop yield

5. High Levels Of Residual Soil Sulphate After Harvest
Super S – Economical and sustainable

Residual soil Sulphate levels post harvest combined with comparable yield results suggest sufficient oxidation for Super-S within the growing season, while offering residual benefits for future crops.
BREAKDOWN
10 MINUTES
AFTER
APPLICATION
IN BONE DRY
CONDITIONS
ASSINIBOIA,
SK
“WE ARE NOW ON OUR THIRD SEASON OF USING ARCTIC S. THE LOW SALT INDEX AND HIGH S CONTENT ARE A PERFECT FIT FOR OUR GROWERS” MATT OWENS, EMERGE AG

“WE LIKED HANDLING LESS PRODUCT & OUR CANOLA IS PROBABLY THE BEST WE HAVE EVER SEEN ON THE FARM” BRANDON SUNDQUIST, WATROUS, SK

“WE HAD A CUSTOMER WHOSE AMS BLENDS WERE CAUSING TROUBLES IN HIS DRILL THIS SPRING. AFTER SWITCHING HIS BLEND OVER TO ARCTIC S, ALL THE PROBLEMS WENT AWAY” SASKATCHEWAN RETAILER
WHERE TO BUY?
THANK YOU

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