

DATE: 26/08/2013

To: MINISTRY OF RURAL DEVELOPMENT & FOOD  
GENERAL DIRECTORATE OF PLANT PRODUCE  
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## **ANNEX III**

**Formulated product:**

**ENTOMELA 50SL**

**CONFIDENTIAL**

**5 - BATCHES ANALYSIS**

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Phytophyl – N.G. STAVRAKIS prepared a 5 BATCHES ANALYSIS report performed in an external laboratory Hellaschem to support the proposed specifications and methods used for chemical analysis.

**1. Specifications of ENTOMELA 50SL manufactured by Phytophyl-N.G.Stavrakis**

ENTOMELA 50SL has the following specifications:

**Active substance:**

- 1) **Urea : 170 g/kg** equals to Ureic nitrogen: 79.3 gr/kg
- 2) **Min Crude protein equivalent: 500 gr/kg** equals to  
Min Total nitrogen content: 80 gr/kg.

**Physicochemical characteristics-properties of the formulated product:**

- 1) Ammonium salts (as  $\text{NH}_4\text{Cl}$ ): max 5.30 % w/w
- 2) Chlorine salts (as  $\text{NaCl}$ ): max 2.0 % w/w
- 3) Amino-acids index: max 2.0 %
- 4) Dry matter: app. 74-82 %
- 5) Insoluble in water: max 0,7%
- 6) PH : 6.2-7.3 (Average normal value: 6.75)
- 7) Density: 1.31-1.39 (Average normal value: 1.35)
- 8) Appearance: Surupy liquid
- 9) Color: Deep reddish brown
- 10) Odor: Characteristic

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## **2. Methods of analysis**

The methods used are all based on AOAC or CIPAC or ISO methods according to the table:

| <b>Test parameter</b>                        | <b>Method of analysis</b>   | <b>Principle</b>                      |
|--|---|---------------------------------------|
| Total nitrogen<br>(Crude protein equivalent) | AOAC 2001.11  | Titrimetry (Kjeldahl)                 |
| Ureic nitrogen                               | Modified AOAC 959.03  | Titrimetry (Kjeldahl)                 |
| Ammoniacal Nitrogen                          | Modified EN 15475:2009<br>Similar method to 2.6.2 section 7.5 EC Reg. 2003/2003 | Titrimetric with cold distillation    |
| Chlorine salts expressed as NaCl             | ISO 1738/2004 or ISO 457/1983   | Titrimetry (Modified Mohr Method)     |
| Amino-acids index                            | Modified AOAC 965.31  | Volumetric (Modified Sorensen Method) |
| Dry matter                                   | Modified CIPAC MT.80 or ISO 2920:2004 at 105° C                                 | Gravimetric                           |
| Insoluble in water                           | Modified CIPAC MT.10.2  | Gravimetric                           |
| PH   | CIPAC 75.3  | Potentiometric                        |
| Density                                      | CIPAC 3.3.2   | Gravimetric                           |
| Appearance                                   | Surupy liquid   | Macroscopic examination               |
| Color  | Deep reddish-brown  | Macroscopic examination               |
| Odor   | Characteristic  | Sensory evaluation                    |

The full description of the above mentioned methods is given in our document "ENTOMELA 50SL - METHOD OF ANALYSIS"

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### 3. Analysis limits

Below are the specifications and the analysis limits for the product ENTOMELA 50SL.

| Active ingredients                             | gr/kg             | Limits according to FAO tolerances for active ingredient ( $\pm 10\%$ ) |             |
|--|-------------------|---|-------------|
|  |                   | Min   | Max         |
| (1)Ureic nitrogen                              | <b>79.3 gr/kg</b> | 71.4 gr/kg  | 87.20 gr/kg |
| (2) Min Total nitrogen content                 | <b>80.0 gr/kg</b> |   |             |
| Average Normal Value of Total Nitrogen content | 84.0 gr/kg        | 80.0 gr/kg*   | 92.4 gr/kg  |

\*Min value of nitrogen content must be according to (2)

| Physicochemical characteristics-properties                                   | Average Normal Value | Min  | Max          |
|--|----------------------|------|--------------|
| Ammoniacal Nitrogen (% w/w)<br>or expressed as<br>NH <sub>4</sub> Cl (% w/w) |                      |      | 1.38<br>5.30 |
| Chlorine salts expressed as NaCl (%w/w)                                      |                      |      | 2.00         |
| Total amino-acids % w/w  |                      |      | 2            |
| Dry matter % w/w   | 78                   | 74   | 82           |
| Insoluble in water max % w/w   |                      |      | 0.7          |
| PH   | 6.75                 | 6.2  | 7.3          |
| Density  | 1.35                 | 1.31 | 1.39         |

### 4. Results of analysis

Hellaschem analysed 5 different batches of the product.

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Below are the summary analysis results for these 5 batches.

| Test parameter  | Batch No 5013011 | Batch No 5013012 | Batch No 5013013 | Batch No 5013014 | Batch No 5013015 |
|---|------------------|------------------|------------------|------------------|------------------|
| Total nitrogen (% w/w)                                | 8.40             | 8.43             | 8.40             | 8.43             | 8.39             |
| Protein equivalent (% w/w)                            | 52.5             | 52.7             | 52.5             | 52.7             | 52.4             |
| Urea nitrogen (%w/w)                                  | 7.95             | 7.97             | 7.90             | 7.94             | 7.92             |
| Urea equivalent (%w/w)                                | 17.3             | 17.3             | 17.2             | 17.3             | 17.2             |
| Ammoniacal Nitrogen (w/w)                             | 0.41             | 0.42             | 0.46             | 0.44             | 0.43             |
| Equivalent ammonium salts as NH <sub>4</sub> Cl (w/w) | 1.6              | 1.6              | 1.8              | 1.7              | 1.6              |
| Chlorine salts as NaCl                                | 1.4              | 1.6              | 1.7              | 1.7              | 1.5              |
| Aminoacid index                                       | 0.8              | 0.9              | 0.8              | 1.0              | 1.1              |
| Dry matter  | 77.1             | 77.6             | 77.7             | 78.0             | 78.0             |
| Insoluble in water                                    | 0.20             | 0.19             | 0.23             | 0.22             | 0.18             |
| pH (25° C)  | 6.65             | 6.70             | 6.48             | 6.67             | 6.56             |
| Density 20° C (g/100ml)                               | 1.368            | 1.360            | 1.369            | 1.366            | 1.357            |

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|       |                    |                    |                    |                    |                    |
|-------|--------------------|--------------------|--------------------|--------------------|--------------------|
| Form  | Surupy liquid      | Surupy liquid      | Surupy liquid      | Surupy liquid      | Surupy liquid      |
| Color | Deep reddish brown | Deep reddish brown | Deep reddish brown | Deep reddish brown | Deep reddish brown |
| Odor  | Characteris tic    | Characteris tic    | Characteris tic    | Characteris tic    | Characteris tic    |

From the above mentioned analytical results we have the following upper and down limits for the 6 tested parameters

| Test parameter  | Results down limit | Results upper limit |
|---|--------------------|---------------------|
| Total nitrogen (% w/w)                                    | 8.39               | 8.43                |
| Protein equivalent (% w/w)                                | 52.4               | 52.7                |
| Urea nitrogen (%w/w)                                      | 7.90               | 7.95                |
| Urea equivalent (%w/w)                                    | 17.2               | 17.3                |
| Ammoniacal Nitrogen (w/w)                                 | 0.41               | 0.46                |
| Equivalent ammonium salts as $\text{NH}_4\text{Cl}$ (w/w) | 1.4                | 1.8                 |
| Chlorine salts as NaCl                                    | 1.4                | 1.7                 |
| Aminoacid index   | 0.8                | 1.1                 |

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|                         |                    |                    |
|-------------------------|--------------------|--------------------|
| Dry matter              | 77.1               | 78.0               |
| Insoluble in water      | 0.19               | 0.23               |
| pH (25° C)              | 6.48               | 6.70               |
| Density 20° C (g/100ml) | 1.357              | 1.369              |
| Form                    | Surupy liquid      | Surupy liquid      |
| Color                   | Deep reddish brown | Deep reddish brown |
| Odor                    | Characteristic     | Characteristic     |

All parameters for these 5 batches are inside the limits of technical specifications of the product see section 3.

The 5 full analysis reports by HELLASCHEM each batch, and the laboratory methods used are given on separate files (HELLASCHEM 5 BATCHES ANALYSIS - ENTOMELA 50SL)

If you need any more information do not hesitate to contact us.

Yours sincerely,  
Dr. Nick Stavrakis