

	<b>ACCREDITATION DOCUMENT</b>	<b>F-06/02</b> <b>Issue Date: 18/08/2020</b> <b>Rev. No: 09</b> <b>LAB 154</b>
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## **Accreditation No: LAB 154**

**Awarded to**

**Soil & Water Testing Lab, For Research  
Government Agricultural Farm, Old Shujabad Road,  
Multan, Pakistan.**

The scope of accreditation is in accordance with the standard specifications outlined in the following page(s) of this document. The accredited scope shall be visible and legible in areas such as customer service, sample-receiving section etc and shall not mislead its users.

The accreditation was first time granted on **02-07-2018** by Pakistan National Accreditation Council.

The laboratory complies with the requirements of **ISO/IEC 17025:2017**.

The accreditation requires regular surveillance, and is valid until **01-07-2024**.

The decision of accreditation made by Pakistan National Accreditation Council implies that the organization has been found to fulfill the requirements for accreditation within the scope.

The organization however, itself is responsible for the results of performed measurements/tests.

**PAKISTAN NATIONAL ACCREDITATION COUNCIL**

**12-10-2021**

**Date**

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**Director General**



**Testing Laboratory.**

Accreditation Scope of **Soil & Water Testing Lab, For Research  
Government Agricultural Farm, Old Shujabad Road,  
Multan, Pakistan.**

Permanent laboratory premises

Materials/Products tested	Testing field (e.g. environmental testing or mechanical testing)	Types of test/ Properties measured	Reference to standardized method (e.g. ISO 14577-1:2003)/ Internal method reference
1- Nitrogen fertilizers Liquid	Chemical testing of fertilizer	1. Ammonical – N 2. Nitrate – N 3. Ureic – N 4. Total - N	<p><b>1. Testing method:</b></p> <p>i. Tandon HLS (Ed.) 2009. Methods of Analysis of Soils, Plants, Waters, Fertilizer and Organic Manures Fertilizer Development and Consultation Organization, New Delhi. Pp 161-162</p> <p>ii. Official Methods of Analysis of AOAC International, 18<sup>th</sup> Edition, 2005, Current through Revision, 4, 2011. Method No. 2.4.10 (AOAC Official Method 892.01), Fertilizers Chapter 2 Page 16.</p> <p><b>2. Instrument required</b></p> <p>i. Nitrogen Distillation Unit</p> <p>ii. Digital Burette.</p> <p>i. Magnetic Stirrer</p> <p>iv. Digestion Block</p>
2- Nitrogen fertilizers Solid	Chemical testing of fertilizer	5. Ammonical – N 6. Nitrate – N 7. Ureic – N 8. Total - N	<p><b>1. Testing method:</b></p> <p>i. Tandon HLS (Ed.) 2009. Methods of Analysis of Soils, Plants, Waters, Fertilizer and Organic Manures Fertilizer Development and Consultation Organization, New Delhi. Pp 161-162</p> <p>ii. Official Methods of Analysis of AOAC International, 18<sup>th</sup> Edition, 2005, Current through Revision, 4, 2011. Method No. 2.4.10 (AOAC Official Method 892.01), Fertilizers Chapter 2 Page 16.</p> <p><b>2. Instrument required</b></p> <p>i. Nitrogen Distillation Unit</p> <p>ii. Digital Burette.</p> <p>ii. Magnetic Stirrer</p> <p>iv. Digestion Block</p>

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3- Nitrogen fertilizers Liquid mix	Chemical testing of fertilizer	9. Ammonical – N 10. Nitrate – N 11. Ureic – N 12. Total - N	<p><b>1. Testing method:</b></p> <p>i. Tandon HLS (Ed.) 2009. Methods of Analysis of Soils, Plants, Waters, Fertilizer and Organic Manures Fertilizer Development and Consultation Organization, New Delhi. Pp 161-162</p> <p>ii. Official Methods of Analysis of AOAC International, 18<sup>th</sup> Edition, 2005, Current through Revision, 4, 2011. Method No. 2.4.10 (AOAC Official Method 892.01), Fertilizers Chapter 2 Page 16.</p> <p><b>2. Instrument required</b></p> <p>i. Nitrogen Distillation Unit  ii. Digital Burette.  iii. Magnetic Stirrer  iv. Digestion Block</p>
4- Nitrogen fertilizers Solid mix	Chemical testing of fertilizer	13. Ammonical – N 14. Nitrate – N 15. Ureic – N 16. Total - N	<p><b>1. Testing method:</b></p> <p>i. Tandon HLS (Ed.) 2009. Methods of Analysis of Soils, Plants, Waters, Fertilizer and Organic Manures Fertilizer Development and Consultation Organization, New Delhi. Pp 161-162</p> <p>ii. Official Methods of Analysis of AOAC International, 18<sup>th</sup> Edition, 2005, Current through Revision, 4, 2011. Method No. 2.4.10 (AOAC Official Method 892.01), Fertilizers Chapter 2 Page 16.</p> <p><b>2. Instrument required</b></p> <p>i. Nitrogen Distillation Unit  ii. Digital Burette.  iv. Magnetic Stirrer  iv. Digestion Block</p>
5- Boron (Liquid Form)	Chemical testing of fertilizer	Acid Soluble Water Soluble	<p><b>1. Testing method:</b></p> <p>Official Methods of Analysis of AOAC International, 18<sup>th</sup> Edition, 2005, Current Through Revision, 4, 2011. Method No. 2.6.04 (AOAC Official Method 982.01), Fertilizers Chapter 2, Subchapter 6, Page 28</p> <p><b>2. Instrument required</b></p> <p>i. Spectrophotometer  ii. Hot plate</p>
6- Mixed Boron Fertilizer (Liquid Form)	Chemical testing of fertilizer	Acid Soluble Water Soluble	<p><b>3. Testing method:</b></p> <p>Official Methods of Analysis of AOAC International, 18<sup>th</sup> Edition, 2005, Current Through Revision, 4, 2011. Method No. 2.6.04 (AOAC Official Method 982.01), Fertilizers Chapter 2, Subchapter 6, Page 28</p>

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			<p><b>4. Instrument required</b></p> <p>iii. Spectrophotometer</p> <p>5. Hot plate</p>
7- Mixed Boron Fertilizer (Solid Form)	Chemical testing of fertilizer	Acid Soluble Water Soluble	<p><b>6. Testing method:</b></p> <p>Official Methods of Analysis of AOAC International, 18<sup>th</sup> Edition, 2005, Current Through Revision, 4, 2011. Method No. 2.6.04 (AOAC Official Method 982.01), Fertilizers Chapter 2, Subchapter 6, Page 28</p> <p><b>7. Instrument required</b></p> <p>iv. Spectrophotometer</p> <p>8. Hot plate</p>
8- Zinc (Liquid form)	Chemical testing of fertilizer	Acid Soluble Water Soluble	<p><b>9. Testing method:</b></p> <p>Official Methods of Analysis of AOAC International, 18<sup>th</sup> Edition, 2005, Current Through Revision, 4, 2011. Method No. 2.6.01 (AOAC Official Method 965.09), Fertilizers Chapter 2, Subchapter 6, Page 29-30</p> <p><b>10. Instrument required</b></p> <p>i. Atomic Absorption Spectrophotometer</p> <p><b>11. ii.</b> Hot plate</p>
9- Zinc (Solid form)	Chemical testing of fertilizer	Acid Soluble Water Soluble	<p><b>1. Testing method:</b></p> <p>Official Methods of Analysis of AOAC International, 18<sup>th</sup> Edition, 2005, Current Through Revision, 4, 2011. Method No. 2.6.01 (AOAC Official Method 965.09), Fertilizers Chapter 2, Subchapter 6, Page 29-30</p> <p><b>2. Instrument required</b></p> <p>i. Atomic Absorption Spectrophotometer</p> <p>ii. Hot plate</p>
10- Waste Compost	Chemical testing of fertilizer	Organic Matter	<p><b>1. Testing method:</b></p> <p>Official Methods of Analysis of AOAC International, 20<sup>th</sup> Edition, 2016. Method No. 967.05 (AOAC Official Method 967.05), Fertilizers Chapter 2, Page 54</p> <p><b>2. Instrument required</b></p> <p>i. Muffle furnace</p> <p>ii. Oven</p>

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11- Waste Compost	Chemical testing of fertilizer	CEC	<p><b>3. Testing method:</b>  Official Methods of Analysis of AOAC International, 20<sup>th</sup> Edition, 2016. Method No. 973.09 Fertilizers Chapter 2, Subchapter 7 Page 56</p> <p><b>4. Instrument required</b>  <b>iii. Muffle furnace</b>  <b>iv. Oven</b>  <b>5.</b></p>
12- Waste Compost	Chemical testing of fertilizer	C:N	<p><b>6. Testing method:</b>  Official Methods of Analysis of AOAC International, 20<sup>th</sup> Edition, 2016. Method No. 973.09 Fertilizers Chapter 2, Subchapter 7 Page 56.</p>
13-Humic acid Liquid	Chemical testing of fertilizer	Gravimetric Method	<p><b>Testing method</b>  1. Gravimetric method of humic acid analysis  2. F.J. Stevenson, J. Environ. Quality, 1972, 1,333  A.K.Fataftah, PhD Thesis, Northeastern University, Boston, 1997.  T.L. Senn and A.R. Kingman, A review of Humus and Humic Acid Research,  <a href="http://www.humates.com/methodology.html">www.humates.com/methodology.html</a>.</p> <p><b>1. Instrument required</b>  i. Oven</p>
14-Humic acid solid	Chemical testing of fertilizer	Gravimetric Method	<p><b>-do-</b></p>
15-Amino acid Solid	Chemical testing of fertilizer	Total amino-acid (protein base)	<p><b>1. Method of analysis</b>  i. FAO nutritional studies no 24(1970).  ii. Pellet, L P and Young (1980).  iii. Theymoli Balasubramanian, Sadasivam (1987).  iv. <a href="http://www.eplantsceinece.com">www.eplantsceinece.com</a></p> <p><b>.Instrument required</b>  <b>i.</b> Nitrogen Distillation Unit  <b>ii.</b> Digital Burette.  <b>iii.</b> Magnetic Stirrer  <b>iv.</b> Digestion Block.</p>

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16-Amino acid liquid	Chemical testing of fertilizer	Total amino-acid (protein base)	<p><b>2. Method of analysis</b></p> <p>v. FAO nutritional studies no 24(1970).</p> <p>vi. Pellet, L P and Young (1980).</p> <p>vii. Theymoli Balasubramanian, Sadasivam (1987).</p> <p>viii. www.eplantsceinece.com</p> <p><b>.Instrument required</b></p> <p><b>i.</b> Nitrogen Distillation Unit</p> <p><b>ii.</b> Digital Burette.</p> <p><b>iii.</b> Magnetic Stirrer</p> <p><b>iv.</b> Digestion Block</p>
17-Chelated Zinc liquid	Chemical testing of fertilizer	Chelated zinc	<p><b>1. Testing method:</b></p> <p>Vogel's Text Book Of Quantitative Chemical Analysis, 6<sup>th</sup> Edition, J Mendham, R C Denney, J D Barnes, M J K Thomas</p> <p><b>2. Instrument required</b></p> <p><b>i.</b> Atomic Absorption Spectrophotometer</p> <p><b>ii.</b> Hot plate</p>
18-Chelated Zinc Solid	Chemical testing of fertilizer	Chelated Zinc	-do-
19-Chelated Zinc, Copper, Iron Manganese in mixed fertilizer solid	Chemical testing of fertilizer	Chelated Zinc, Copper, Iron and Manganese	-do-
20-Chelated Zinc, Copper, Iron Manganese in mixed fertilizer Liquid	Chemical testing of fertilizer	Chelated Zinc, Copper, Iron and Manganese	-do-
21- Potassium in Fertilizer Solid	Chemical Testing of fertilizer	Water Soluble	<p>Testing Method:</p> <p>Testing Method for Fertilizer (2016). Incorporated Administrative Agency. Food &amp; Agricultural materias inspection Centre.Japan. Section :4.3.3.a.</p> <p>Standard operating manual of instrument</p> <p>Instrument Used:</p> <p>Flame Photometer</p>

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22- Potassium in Fertilizer liquide	Chemical Testing of fertilizer	Water Soluble	Testing Method: Testing Method for Fertilizer (2016). Incorporated Administrative Agency. Food & Agricultural materials inspection Centre.Japan. Section :4.3.3.a. Standard operating manual of instrument Instrument Used: Flame Photometer
23- Potassium in Fertilizer mix ( Solid )	Chemical Testing of fertilizer	Water Soluble	Testing Method: Testing Method for Fertilizer (2016). Incorporated Administrative Agency. Food & Agricultural materials inspection Centre.Japan. Section :4.3.3.a. Standard operating manual of instrument Instrument Used: Flame Photometer
24- Potassium in Fertilizer mix ( liquide )	Chemical Testing of fertilizer	Water Soluble	Testing Method: Testing Method for Fertilizer (2016). Incorporated Administrative Agency. Food & Agricultural materials inspection Centre.Japan. Section :4.3.3.a. Standard operating manual of instrument Instrument Used: Flame Photometer
25- Phosphorus in fertilizer solid	Chemical Testing of fertilizer	Citrate Soluble/ Titrimetric method	Testing Method: Pakistan Standard for Single Super Phosphate (2 <sup>nd</sup> edition)PS:67-1996. PSQCA. Karachi
26. Total Phosphorus from Bio-Organic Phosphate	Chemical Testing of fertilizer	Acid Soluble/ Titrimetric method	Testing Method: Pakistan Standard for BOP. PS:5295/2017 (2 <sup>nd</sup> Revision), PSQCA. Karachi.
27- Mixed Zinc Fertilizer (Liquid form)	Chemical testing of fertilizer	Acid Soluble Water Soluble	<b>3. Testing method:</b> Official Methods of Analysis of AOAC International, 18 <sup>th</sup> Edition, 2005, Current Through Revision, 4, 2011. Method No. 2.6.01 (AOAC Official Method 965.09), Fertilizers Chapter 2, Subchapter 6, Page 29-30  <b>4. Instrument required</b> i. Atomic Absorption Spectrophotometer ii. Hot plate

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28- Mixed Zinc Fertilizer (Solid form)	Chemical testing of fertilizer	Acid Soluble Water Soluble	<p><b>5. Testing method:</b>  Official Methods of Analysis of AOAC International, 18<sup>th</sup> Edition, 2005, Current Through Revision, 4, 2011. Method No. 2.6.01 (AOAC Official Method 965.09), Fertilizers Chapter 2, Subchapter 6, Page 29-30</p> <p><b>6. Instrument required</b>  i. Atomic Absorption Spectrophotometer  ii. Hot plate</p>
29- Iron fertilizer Solid	Chemical testing of fertilizer	Acid Soluble Water Soluble	<p><b>7. Testing method:</b>  Official Methods of Analysis of AOAC International, 18<sup>th</sup> Edition, 2005, Current Through Revision, 4, 2011. Method No. 2.6.01 (AOAC Official Method 965.09), Fertilizers Chapter 2, Subchapter 6, Page 29-30</p> <p><b>8. Instrument required</b>  i. Atomic Absorption Spectrophotometer  ii. Hot plate</p>
30- Iron fertilizer Liquid	Chemical testing of fertilizer	Acid Soluble Water Soluble	<p><b>1. Testing method:</b>  Official Methods of Analysis of AOAC International, 18<sup>th</sup> Edition, 2005, Current Through Revision, 4, 2011. Method No. 2.6.01 (AOAC Official Method 965.09), Fertilizers Chapter 2, Subchapter 6, Page 29-30</p> <p><b>2. Instrument required</b>  i. Atomic Absorption Spectrophotometer  ii. Hot plate</p>
31- Iron fertilizer Solid Mixed	Chemical testing of fertilizer	Acid Soluble Water Soluble	<p><b>1. Testing method:</b>  Official Methods of Analysis of AOAC International, 18<sup>th</sup> Edition, 2005, Current Through Revision, 4, 2011. Method No. 2.6.01 (AOAC Official Method 965.09), Fertilizers Chapter 2, Subchapter 6, Page 29-30</p> <p><b>2. Instrument required</b>  i. Atomic Absorption Spectrophotometer  ii. Hot plate</p>
32- Iron fertilizer Liquid Mixed	Chemical testing of fertilizer	Acid Soluble Water Soluble	<p><b>1. Testing method:</b>  Official Methods of Analysis of AOAC International, 18<sup>th</sup> Edition, 2005, Current Through Revision, 4, 2011. Method No. 2.6.01 (AOAC</p>

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			Official Method 965.09), Fertilizers Chapter 2, Subchapter 6, Page 29-30  <b>2. Instrument required</b> i. Atomic Absorption Spectrophotometer ii. Hot plate
33- Copper fertilizer Solid	Chemical testing of fertilizer	Acid Soluble Water Soluble	<b>1. Testing method:</b> Official Methods of Analysis of AOAC International, 18 <sup>th</sup> Edition, 2005, Current Through Revision, 4, 2011. Method No. 2.6.01 (AOAC Official Method 965.09), Fertilizers Chapter 2, Subchapter 6, Page 29-30  <b>2. Instrument required</b> i. Atomic Absorption Spectrophotometer ii. Hot plate
34- Copper fertilizer Liquid	Chemical testing of fertilizer	Acid Soluble Water Soluble	<b>1. Testing method:</b> Official Methods of Analysis of AOAC International, 18 <sup>th</sup> Edition, 2005, Current Through Revision, 4, 2011. Method No. 2.6.01 (AOAC Official Method 965.09), Fertilizers Chapter 2, Subchapter 6, Page 29-30  <b>2. Instrument required</b> i. Atomic Absorption Spectrophotometer ii. Hot plate
35- Copper Solid Mixed	Chemical testing of fertilizer	Acid Soluble Water Soluble	<b>1. Testing method:</b> Official Methods of Analysis of AOAC International, 18 <sup>th</sup> Edition, 2005, Current Through Revision, 4, 2011. Method No. 2.6.01 (AOAC Official Method 965.09), Fertilizers Chapter 2, Subchapter 6, Page 29-30  <b>2. Instrument required</b> i. Atomic Absorption Spectrophotometer ii. Hot plate
36- Copper Liquid Mixed	Chemical testing of fertilizer	Acid Soluble Water Soluble	<b>1. Testing method:</b> Official Methods of Analysis of AOAC International, 18 <sup>th</sup> Edition, 2005, Current Through Revision, 4, 2011. Method No. 2.6.01 (AOAC Official Method 965.09), Fertilizers Chapter 2, Subchapter 6, Page 29-30  <b>2. Instrument required</b> i. Atomic Absorption Spectrophotometer ii. Hot plate

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			Spectrophotometer ii. Hot plate
37- Manganese fertilizer Solid	Chemical testing of fertilizer	Acid Soluble Water Soluble	<p><b>1. Testing method:</b>  Official Methods of Analysis of AOAC International, 18<sup>th</sup> Edition, 2005, Current Through Revision, 4, 2011. Method No. 2.6.01 (AOAC Official Method 965.09), Fertilizers Chapter 2, Subchapter 6, Page 29-30</p> <p><b>2. Instrument required</b>  i. Atomic Absorption Spectrophotometer  ii. Hot plate</p>
38- Manganese fertilizer Liquid	Chemical testing of fertilizer	Acid Soluble Water Soluble	<p><b>1. Testing method:</b>  Official Methods of Analysis of AOAC International, 18<sup>th</sup> Edition, 2005, Current Through Revision, 4, 2011. Method No. 2.6.01 (AOAC Official Method 965.09), Fertilizers Chapter 2, Subchapter 6, Page 29-30</p> <p><b>2. Instrument required</b>  i. Atomic Absorption Spectrophotometer  ii. Hot plate</p>
39- Manganese Solid Mixed	Chemical testing of fertilizer	Acid Soluble Water Soluble	<p><b>1. Testing method:</b>  Official Methods of Analysis of AOAC International, 18<sup>th</sup> Edition, 2005, Current Through Revision, 4, 2011. Method No. 2.6.01 (AOAC Official Method 965.09), Fertilizers Chapter 2, Subchapter 6, Page 29-30</p> <p><b>2. Instrument required</b>  i. Atomic Absorption Spectrophotometer  ii. Hot plate</p>
40- Manganese Liquid	Chemical testing of fertilizer	Acid Soluble Water Soluble	<p><b>1. Testing method:</b>  Official Methods of Analysis of AOAC International, 18<sup>th</sup> Edition, 2005, Current Through Revision, 4, 2011. Method No. 2.6.01 (AOAC Official Method 965.09), Fertilizers Chapter 2, Subchapter 6, Page 29-30</p> <p><b>2. Instrument required</b>  i. Atomic Absorption Spectrophotometer  ii. Hot plate</p>

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41- Sulphur in Sulphate of Potash fertilizer	Chemical testing of fertilizer	Water Soluble Sulphur	<ol style="list-style-type: none"> <li>1.Diagnosis &amp; Improvement of Salineand Alkaline soils, USDA, Handbook No 60 pp 146.</li> <li>2. AOAC-2,6.28, 17<sup>th</sup> edition, Method No.928.02 Determination of Sulphur in Fertilizer.</li> <li>3. Pakistan Standard Specification for Potassium Sulphate fertilizer grade, 2<sup>nd</sup> Revision, PSQCA.Karachi, PS:1501-2011 (R) ICS:65.080.</li> </ol> <p style="text-align: center;"><b>3.</b></p>
42- Chloride in Sulphate of Potash fertilizer	Chemical Testing of fertilizer	Water Soluble	<ol style="list-style-type: none"> <li>1.Diagnosis &amp; Improvement of Salineand Alkaline soils, USDA, Handbook No 60 pp 146.</li> <li>2. AOAC-2,6.09, 17<sup>th</sup> edition, Method No.928.02 Determination of Chloride in Fertilizer.</li> <li>3. Pakistan Standard Specification for Potassium Sulphate fertilizer grade, 2<sup>nd</sup> Revision, PSQCA.Karachi, PS:1501-2011 (R) ICS:65.080.</li> </ol> <p style="text-align: center;"><b>4.</b></p>

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