

Non-NABL Parameters offered by Central Laboratory Facility, ICAR-CRRI

Sl. No.	Parameters	Method
1.	Amino acid profiling (17 amino acids as mentioned above)	Acid hydrolysis method
2.	Histidine	Acid hydrolysis method
3.	Serine	Acid hydrolysis method
4.	Arginine	Acid hydrolysis method
5.	Glycine	Acid hydrolysis method
6.	Aspartic acid	Acid hydrolysis method
7.	Glutamic acid	Acid hydrolysis method
8.	Threonine	Acid hydrolysis method
9.	Alanine	Acid hydrolysis method
10.	Proline	Acid hydrolysis method
11.	Cysteine	Acid hydrolysis method
12.	Lysine	Acid hydrolysis method
13.	Tyrosine	Acid hydrolysis method
14.	Methionine	Acid hydrolysis method
15.	Valine	Acid hydrolysis method

16.	Isoleucine	Acid hydrolysis method
17.	Leucine	Acid hydrolysis method
18.	Phenyl alanine	Acid hydrolysis method
19.	Identification of volatiles using scan mode	Lab developed SPME method
20.	Volatile estimation (2-AP)	Lab developed SPME method
21.	Identification of volatiles in liquid sample using scan mode	Lab developed SPME method
22.	Quantification of pesticides by GC-MS/MS With sample preparation	QUECHERS Method
23.	Quantification of pesticides by GC-MS/MS Without sample preparation	QUECHERS Method
24.	Quantification of pesticides by LC-MS/MS With sample preparation	QUECHERS Method
25.	Quantification of pesticides by LC-MS/MS Without sample preparation	QUECHERS Method
26.	Quantification of pesticides using both GCMS and LC- MS/MS with sample preparation	QUECHERS Method
27.	Acephate	QUECHERS Method
28.	Allyl isothiocyanate	QUECHERS Method
29.	Anilophos	QUECHERS Method
30.	Attrazine	QUECHERS Method
31.	Azoxistrobin	QUECHERS Method
32.	Bensulfuron methyl	QUECHERS Method
33.	Bifenthrin	QUECHERS Method
34.	Bispyribac sodium salt	QUECHERS Method

35.	Bromodiolone	QUECHERS Method
36.	Buprofeizin	QUECHERS Method
37.	Butachlor esa sodium salt	QUECHERS Method
38.	Caproprmid	QUECHERS Method
39.	Carbendazim	QUECHERS Method
40.	Carbofuran	QUECHERS Method
41.	Carbosulfan	QUECHERS Method
42.	Chlorantraniliprole	QUECHERS Method
43.	Chlorimuron ethyl	QUECHERS Method
44.	Chlorpyrifos	QUECHERS Method
45.	Cinmethylin	QUECHERS Method
46.	Clomazone	QUECHERS Method
47.	Flonicamid	QUECHERS Method
48.	Flouropyram	QUECHERS Method
49.	Flufenacet	QUECHERS Method
50.	Flusilazole	QUECHERS Method
51.	Hexaconazole	QUECHERS Method
52.	Imidacloprid	QUECHERS Method
53.	Indoxacarb	QUECHERS Method
54.	Iprodione	QUECHERS Method
55.	Isoprothiolane	QUECHERS Method

56.	Kresoxim methyl	QUECHERS Method
57.	Lamda cyhalothrin	QUECHERS Method
58.	Malathion	QUECHERS Method

59.	Metconazole	QUECHERS Method
60.	Methamidophos	QUECHERS Method
61.	Metsulfuran methyl	QUECHERS Method
62.	Oxadiargyl	QUECHERS Method
63.	Oxadiazone	QUECHERS Method
64.	Oxyflurofuran	QUECHERS Method
65.	Pencycuran	QUECHERS Method
66.	Pendimethalin	QUECHERS Method
67.	Phenthoate	QUECHERS Method
68.	Phosalone	QUECHERS Method
69.	Picoxystrobin	QUECHERS Method
70.	Pirimiphos methyl	QUECHERS Method
71.	Pretilachlor	QUECHERS Method
72.	Profenofos	QUECHERS Method
73.	Propiconazole	QUECHERS Method
74.	Prothioconazole	QUECHERS Method
75.	Pymetrozine	QUECHERS Method
76.	Pyraclostrobin	QUECHERS Method
77.	Pyrazo sulfuron methyl	QUECHERS Method
78.	Quinalphos	QUECHERS Method
79.	Tebuconazole	QUECHERS Method
80.	Tricyclazole	QUECHERS Method
81.	Trifloxystrobin	QUECHERS Method
82.	Triflumezopyrim	QUECHERS Method

83.	Alpha -BHC	QUECHERS Method
84.	Beta -BHC	QUECHERS Method
85.	Lindane	QUECHERS Method
86.	Delta-BHC	QUECHERS Method
87.	Heptachlor	QUECHERS Method
88.	Acephate	QUECHERS Method
89.	Allyl isothiocyanate	QUECHERS Method
90.	Anilophos	QUECHERS Method
91.	Attrazine	QUECHERS Method
92.	Azoxystrobin	QUECHERS Method
93.	Bensulfuron methyl	QUECHERS Method
94.	Bifenthrin	QUECHERS Method
95.	Bispyribac sodium salt	QUECHERS Method
96.	Bromdiolone	QUECHERS Method
97.	Buprofeizin	QUECHERS Method
98.	Butachlor esa sodium salt	QUECHERS Method
99.	Caproprmid	QUECHERS Method
100.	Carbendazim	QUECHERS Method
101.	Carbofuran	QUECHERS Method
102.	Carbosulfan	QUECHERS Method
103.	Chlorantraniliprole	QUECHERS Method
104.	Chlorimuron ethyl	QUECHERS Method
105.	Chlorpyrifos	QUECHERS Method
106.	Cinmethylin	QUECHERS Method

107.	Clomazone	QUECHERS Method
108.	Flonicamid	QUECHERS Method
109.	Flouropyram	QUECHERS Method
110.	Flufenacet	QUECHERS Method
111.	Flusilazole	QUECHERS Method
112.	Hexaconazole	QUECHERS Method
113.	Imidacloprid	QUECHERS Method
114.	Indoxacarb	QUECHERS Method
115.	Iprodione	QUECHERS Method
116.	Isoprothiolane	QUECHERS Method
117.	Kresoxim methyl	QUECHERS Method
118.	Lamda cyhalothrin	QUECHERS Method
119.	Malathion	QUECHERS Method
120.	Metconazole	QUECHERS Method
121.	Methamidophos	QUECHERS Method
122.	Metsulfuran methyl	QUECHERS Method
123.	Oxadiargyl	QUECHERS Method
124.	Oxadiazone	QUECHERS Method
125.	Oxyflurofuran	QUECHERS Method
126.	Pencycuron	QUECHERS Method
127.	Pendimethalin	QUECHERS Method
128.	Phenthoate	QUECHERS Method
129.	Phosalone	QUECHERS Method
130.	Picoxystrobin	QUECHERS Method

131.	Pirimiphos methyl	QUECHERS Method
132.	Pretilachlor	QUECHERS Method
133.	Profenofos	QUECHERS Method
134.	Propiconazole	QUECHERS Method
135.	Prothioconazole	QUECHERS Method
136.	Pymetrozine	QUECHERS Method
137.	Pyraclostrobin	QUECHERS Method
138.	Pyrazo sulfuron methyl	QUECHERS Method
139.	Quinalphos	QUECHERS Method
140.	Tebuconazole	QUECHERS Method
141.	Tricyclazole	QUECHERS Method
142.	Trifloxystrobin	QUECHERS Method
143.	Triflumezopyrim	QUECHERS Method
144.	Fatty acid profiling	Method described by Metcalfe et al. 1966
145.	Methyl butyrate	Method described by Metcalfe et al. 1966
146.	Methyl hexanoate	Method described by Metcalfe et al. 1966
147.	Methyl octanoate	Method described by Metcalfe et al. 1966
148.	Methyl decanoate	Method described by Metcalfe et al. 1966
149.	Methyl undecanoate	Method described by Metcalfe et al. 1966

150.	Methyl laurate	Method described by Metcalfe et al. 1966
151.	Methyl tridecanoate	Method described by Metcalfe et al. 1966
152.	Methyl myristate	Method described by Metcalfe et al. 1966
153.	Methyl myristoleate	Method described by Metcalfe et al. 1966
154.	Methyl pentadecanoate	Method described by Metcalfe et al. 1966
155.	Methyl <i>cis</i> -10- pentadecenoate	Method described by Metcalfe et al. 1966
156.	Methyl palmitate	Method described by Metcalfe et al. 1966
157.	Methyl palmitoleate	Method described by Metcalfe et al. 1966
158.	Methyl heptadecanoate	Method described by Metcalfe et al. 1966
159.	<i>cis</i> -10-Heptadecanoicacid methy lester	Method described by Metcalfe et al. 1966
160.	Methyl stearate	Method described by Metcalfe et al. 1966
161.	<i>trans</i> -9-Elaidic acid methyl ester	Method described by Metcalfe et al. 1966

162.	<i>cis</i> -9-Oleicacid methyl ester	Method described by Metcalfe et al. 1966
163.	Methyl linolelaidate	Method described by Metcalfe et al. 1966
164.	Methyl linoleate	Method described by Metcalfe et al. 1966
165.	Methyl arachidate	Method described by Metcalfe et al. 1966
166.	Methyl γ -linolenate	Method described by Metcalfe et al. 1966
167.	Methyl <i>cis</i> -11-eicosenoate	Method described by Metcalfe et al. 1966
168.	Methyl linolenate	Method described by Metcalfe et al. 1966
169.	Methyl heneicosanoate	Method described by Metcalfe et al. 1966
170.	<i>cis</i> -11,14-Eicosadienoicacid methyl ester	Method described by Metcalfe et al. 1966
171.	Methyl behenate	Method described by Metcalfe et al. 1966
172.	<i>cis</i> -8,11,14-Eicosatrienoicacid methyl ester	Method described by Metcalfe et al. 1966
173.	Methyl erucate	Method described by Metcalfe et al. 1966

174.	<i>cis</i> -11,14,17-Eicosatrienoicacid methyl ester	Method described by Metcalfe et al. 1966
175.	<i>cis</i> -5,8,11,14-Eicosatetraenoicacid methyl ester	Method described by Metcalfe et al. 1966
176.	Methyl tricosanoate	Method described by Metcalfe et al. 1966
177.	<i>cis</i> -13,16-Docosadienoicacid methyl ester	Method described by Metcalfe et al. 1966
178.	Methyl lignocerate	Method described by Metcalfe et al. 1966
179.	<i>cis</i> -5,8,11,14,17-Eicosapentaenoicacid methyl ester	Method described by Metcalfe et al. 1966
180.	Methyl nervonate	Method described by Metcalfe et al. 1966
181.	<i>cis</i> -4,7,10,13,16,19-Docosahexaenoic acid methyl ester	Method described by Metcalfe et al. 1966
182.	Solvent evaporation from mixture	Instrument manual
183.	Solvent evaporation from mixture	Instrument manual
184.	Moisture%, Protein% Amylose%	Calibration based NIR method, C.V.K. Kandala et al. 2008, ISO 12099
185.	Moisture %	Calibration based NIR method, C.V.K. Kandala et al. 2008, ISO 12099

186.	Protein %	Calibration based NIR method, ISO 12099
187.	Amylose %	Calibration based NIR method, ISO 12099
188.	4 Estimation of Color Index by using Hunter Lab Colorimeter L A b Whiteness Index, ΔL Δa Δb ΔE	Hunter Lab Colorimeter Method CIE 15;2004, ISO 7724/1, ASTM E1164, DIN 5033, Teil 7 and JIS Z 8722
189.	Rapid visco- analyzer (RVA) parameters (Peak viscosity, Pasting properties of rice and rice-based products using RVA, Break down viscosity, Set back viscosity (in RVU), Peak temperature (°C).)	Goode DL, Wiltshko EA, Ulmer HM, Arendt EK (2005) Application of the Rapid Visco Analyser as a rheological tool for the characterization of mash viscosity as affected by the level of barley adjunct. J Inst Brew 111(2):165–174
190.	FN value (in Centipoise): starch properties	Alpha-Amylase Activity Test — AACCCI Method No. 56-81.03, ICC No. 107/1, ISO 3093, ASBC
191.	Estimation of Textural property of rice and Rice based value added products (PTA, Hardness, Fracturability, Extensibility, Adhesiveness)	AACC (1991) Bourne 1978
192.	Estimation of Textural property (PTA)	AACC (1991) Bourne 1978

193.	Estimation of Textural property (Hardness)	AACC (1991) Bourne 1978
194.	Estimation of Textural property (Fracturability)	AACC (1991) Bourne 1978
195.	Estimation of Textural property (Extensibility)	AACC (1991) Bourne 1978
196.	Estimation of Textural property (Adhesiveness)	AACC (1991) Bourne 1978
197.	Total reducing sugar in the sample expressed in mg/g or percentage	Reducing sugar estimation by Nelson-Somogyi Method Breuil C. and Saddler J.N. (1985)
198.	Total sugar content in the sample expressed in mg/g or percentage	Total Sugar estimation by Anthrone Reagent method
199.	Starch content in the sample will be provided in mg/g or percentage	Starch estimation by Perchloric Acid method Rose et al., (1991)
200.	Amylose in rice sample expressed in mg/g or as percentage.	Amylose in rice sample and rice- based products using iodine solution (Juliano 2003)
201.	Hulling%,	Razavi, S. M. A and Farahmandfar, R (2008)
202.	Milling%	Manual method Farahmandfar, R (2008)
203.	Head Rice recovery%	Lab Developed method

204.	Length and breadth of grain in millimetre, Grain type determination as per American standards Chalky grain%.	Scanning based automated method
205.	Alkali spreading value of the grain based on visual comparison with standard chart.	KOH Method Mariotti et al., (2010)
206.	Gel consistency (in mm) of the rice sample as per method described by Juliano B.O, 1980.	Juliano B.O. method.
207.	Thousand grain weight of the sample is reported (in mg) by manual method.	Thousand grain weight
208.	Water uptake of rice sample expressed in ml/100g.	Lab Developed method
209.	Initial volume before cooking and final volume after cooking are expressed in milliliters and volume expansion ratio is calculated.	Lab Developed method
210.	Kernel length after cooking is expressed in mm.	Manual method using graph paper
211.	Initial Kernel length before cooking and final kernel length after cooking are expressed in mm and Kernel elongation ratio is calculated.	Lab Developed method
212.	Total crude protein in the rice sample in mg/g or percentage.	Kjeldahl Method
213.	Zinc content in grain/ straw/ rice-based product expressed in ppm per sample of brown rice or milled rice.	Zinc estimation in Rice sample (grain or straw) using AAS (Atomic Absorption Spectrophotometer)

214.	Non-destructive estimation of Iron (Fe) in paddy, brown or milled rice grains, paddy straw and rice-based products expressed in mg/g.	Rice grain Iron (Fe) and Zinc (Zn) concentrations estimation through pre-calibrated methods in ED- XRF
215.	Non-destructive estimation of Zinc (Zn) concentrations in paddy, brown or milled rice grains, paddy straw and rice-based products expressed in mg/g.	Rice grain Iron (Fe) and Zinc (Zn) concentrations estimation through pre-calibrated methods in ED- XRF
216.	Total anthocyanin content expressed as mg per 100g.	Methanol-HCL method
217.	Gamma-oryzanol in sample expressed as mg per 100g.	HPLC grade isopropanol method. Chen and Bergman (2005) content
218.	Total phenolic content in the sample expressed as mg catechol equivalent per 100g.	Folin & Ciocalteus Method Zilic et al. (2011)
219.	Total flavonoid content in the sample expressed as mg Catechine equivalent per 100g.	Eberhardt et al. (2000)
220.	Total oil or fat content in the sample will be provided in mg/g or percentage	Total Fat/Oil estimation by Soxhlet apparatus
221.	Electrophysiological response using EAG	Instrument manual
222.	Electrophysiological response using GC-EAD	Lab developed method
223.	Observation of plant or Insect sample	Lab developed method
224.	Observation of plant tissues, microbial cultures, protoplast imaging	Lab developed method

225.	Observation of plant cells and tissues, insect pests & microorganisms	Lab developed method
226.	PS-II efficiency of Chlorophyll a, Maximum Fluorescence & Minimal Fluorescence	Lab developed method
227.	Estimation of NDF, ADL ADF (Neutral detergent fiber)	Lab developed method
228.	HPLC for organic acids estimation using PDA Oxalic acid	Lab developed method
229.	Tartaric acid	Lab developed method
230.	Quinic acid	Lab developed method
231.	Ascorbic acid	Lab developed method
232.	Lactic acid	Lab developed method
233.	Maleic acid	Lab developed method
234.	Succinic acid	Lab developed method
235.	Isocitric acid	Lab developed method
236.	Adipic acid	Lab developed method
237.	Citric acid	Lab developed method
238.	Malonic acid	Lab developed method
239.	Maleic acid	Lab developed method
240.	Phytic acid	Lab developed method
241.	Shikimic acid	Lab developed method
242.	Adipic acid	Lab developed method
243.	Propionic acid	Lab developed method
244.	Quantification of CH ₄ concentration by GC	Lab developed method
245.	Quantification of N ₂ O concentration by GC	Lab developed method
246.	Quantification of CO ₂ concentration by GC	Lab developed method

247.	Glycemic Index estimation	Lab developed method invitro & invivo methods
248.	Phytic acid assay in rice grain	Lab developed Phytase & alkaline phosphatase method
249.	Estimation of Total Carbon in soil, straw & water sample	Lab developed method
250.	Estimation Total Nitrogen in soil, straw & water sample	Lab developed method
251.	Observation of VAM spores, soil nematode, soil tiny macroflora/ insects etc.	Lab developed method
252.	Quantification of micronutrients and trace elements in soil, plant and water samples by using AAS Cu	DTPA extract/ Direct Filtered Sample method
253.	Pb	DTPA extract/ Direct Filtered Sample method
254.	Zn	DTPA extract/ Direct Filtered Sample method
255.	Mn	DTPA extract/ Direct Filtered Sample method
256.	Ni	DTPA extract/ Direct Filtered Sample method
257.	Co	DTPA extract/ Direct Filtered Sample method
258.	Cd	DTPA extract/ Direct Filtered Sample method
259.	Cr	DTPA extract/ Direct Filtered Sample method
260.	Fe	DTPA extract/ Direct Filtered Sample method

261.	As	DTPA extract/ Direct Filtered Sample method
262.	Acid digestion for sample i.e. soil, plant, sewage & slag	Lab developed method
263.	For Soil sample analysis of Na by using Flame photometer	Lab developed method
264.	For Soil sample analysis of K by using Flame photometer	Lab developed method
265.	For Soil sample analysis of Ca by using Flame photometer	Lab developed method
266.	Quantification of intensity of light emitted by atoms or ions of the elements of interest at specific wavelengths and can be used for the determination of various elements in soil, plant and water samples following elements.	DTPA extract/ Direct Filtered Sample method
267.	Cu	DTPA extract/ Direct Filtered Sample method
268.	Pb	DTPA extract/ Direct Filtered Sample method
269.	Zn	DTPA extract/ Direct Filtered Sample method
270.	Mn	DTPA extract/ Direct Filtered Sample method
271.	Ni	DTPA extract/ Direct Filtered Sample method
272.	Co	DTPA extract/ Direct Filtered Sample method

273.	Cd	DTPA extract/ Direct Filtered Sample method
274.	Cr	DTPA extract/ Direct Filtered Sample method
275.	Fe	DTPA extract/ Direct Filtered Sample method
276.	As	DTPA extract/ Direct Filtered Sample method
277.	Genotyping and single nucleotide polymorphism detection based on the principle of (MALDI-TOF) mass spectrometry.	Principle of (MALDI-TOF) mass spectrometry.
278.	Microbial community analysis with ecoplates by using Biolog Microstation	Lab developed method
279.	Quantification of nucleic acid by using Nanodrop Spectrophotometer	Nano drop Spectrophotometry method
280.	Quantification of Protein by using Nanodrop Spectrophotometer	Nano drop Spectrophotometry method
281.	Visualization of nucleic acids (in Agarose gel, Polyacrylamide gel)	Lab developed method
282.	Cellular organelle isolation/Subcellular fractionation	Lab developed method
283.	Vacuum Concentration of DNA, RNA, Nucleotides, proteins and other liquid or wet sample	Lab developed method
284.	Ultrapure water (per lit)	Instrument manual
285.	Measurement of Surface Area of leaves (Minimum 50 samples)	Lab developed method
286.	Gas exchange parameter by using portable photosynthesis system (photosynthetic rate, Stomatal conductance,	Lab developed method

	Transpiration)	
287.	Gas exchange parameter by using portable photosynthesis system (photosynthetic rate)	Lab developed method
288.	Gas exchange parameter by using portable photosynthesis system (Stomatal conductance)	Lab developed method
289.	Gas exchange parameter by using portable photosynthesis system (Transpiration)	Lab developed method
290.	Measurement of Soil Moisture Content by using Time Domain Reflectometry (minimum 100 samples)	Lab developed method
291.	Measurement of Root length, radius, volume by Root Analyzer (Minimum 50 samples)	Lab developed method
292.	Measurement of Canopy Temperature by using Infrared Camera (Minimum 100 samples)	Lab developed method
293.	Transmission Electron Microscope for plant and animal tissues	Lab developed method
294.	Quantification of DNA & transcript by using RTPCR	Lab developed method
295.	Ultramicrotome of resin embedded plant tissues, animal tissues & fungal mycelium	Lab developed method
296.	pH	Lab developed method
297.	EC	Lab developed method

New parameters (in addition of 297 parameters)

S.I. No.	Parameters	Sample type
1	Bacterial, fungal and actinomycetes counts	Soil
2	Dehydrogenase activities	Soil
3	FDA activities	Soil
4	Beta glucosidase activities	Soil
5	Acid phosphatase	Soil
6	Alkaline phosphatase	Soil
7	Microbial Biomass Carbon (MBC)	Soil
8	Readily Mineralizable Carbon (RMC)	Soil