

## PROJECT AGRICULTURE OPTIMIZATION ANALYSIS BY SPSS (1)

### § Frequencies(Without Outlier):

Statistics							
N	Valid	Nitrogen	Phosphorus	Potassium	Temperature	Humidity	pH
	Missing	2200	2200	2200	2200	2200	2200
		0	0	0	0	0	0
Mean		50.5518	46.3600	34.3436	25.4745	76.2315	6.4552
Std. Error of Mean		.78708	.45322	.35443	.08457	.31906	.01350
Median		37.0000	51.0000	32.0000	25.6100	80.4731	6.4441
Mode		22.00 <sup>a</sup>	56.36	48.14	25.61	71.48	6.47
Std. Deviation		36.91733	21.25790	16.62406	3.96666	14.96536	.63330
Variance		1362.890	451.898	276.359	15.734	223.962	.401
Skewness		.510	-.193	.758	-.041	-.666	.145
Std. Error of Skewness		.052	.052	.052	.052	.052	.052
Kurtosis		-1.058	-.877	.386	-.199	-.407	-.167
Std. Error of Kurtosis		.104	.104	.104	.104	.104	.104
Range		140.00	90.00	80.00	20.14	69.58	3.43
Minimum		.00	5.00	5.00	15.54	30.40	4.72
Maximum		140.00	95.00	85.00	35.68	99.98	8.15
Sum		111214.00	101992.01	75556.00	56043.92	167709.33	14201.51
							193248.53
							3

a. Multiple modes exist. The smallest value is shown.

### § Descriptives(Without Outlier):

Descriptive Statistics							
	N Statistic	Range Statistic	Minimum Statistic	Maximum Statistic	Sum Statistic	Mean	
Nitrogen	2200	140.00	.00	140.00	111214.00	50.5518	.78708
Phosphorus	2200	90.00	5.00	95.00	101992.01	46.3600	.45322
Potassium	2200	80.00	5.00	85.00	75556.00	34.3436	.35443
Temperature	2200	20.14	15.54	35.68	56043.92	25.4745	.08457
Humidity	2200	69.58	30.40	99.98	167709.33	76.2315	.31906
pH	2200	3.43	4.72	8.15	14201.51	6.4552	.01350
Rainfall	2200	146.43	20.21	166.64	193248.53	87.8402	.68703
Valid N (listwise)	2200						

Descriptive Statistics						
	Std. Deviation Statistic	Variance Statistic	Skewness		Kurtosis	
			Statistic	Std. Error	Statistic	Std. Error
Nitrogen	<b>36.91733</b>	<b>1362.890</b>	.510	.052	<b>-1.058</b>	.104
Phosphorus	<b>21.25790</b>	<b>451.898</b>	-.193	.052	<b>-.877</b>	.104
Potassium	<b>16.62406</b>	<b>276.359</b>	.758	.052	<b>.386</b>	.104
Temperature	<b>3.96666</b>	<b>15.734</b>	-.041	.052	<b>-.199</b>	.104
Humidity	<b>14.96536</b>	<b>223.962</b>	-.666	.052	<b>-.407</b>	.104
pH	<b>.63330</b>	<b>.401</b>	.145	.052	<b>-.167</b>	.104
Rainfall	<b>32.22439</b>	<b>1038.411</b>	.002	.052	<b>-.375</b>	.104
Valid N (listwise)						

### Missing Values and Correlations:

### Missing Values:

#### Statistics

#### Crop

N	Valid	2200
	Missing	0

Valid		Crop			
		Frequency	Percent	Valid Percent	Cumulative Percent
	apple	100	4.5	4.5	4.5
	banana	100	4.5	4.5	9.1
	black gram	100	4.5	4.5	13.6
	chickpea	100	4.5	4.5	18.2
	coconut	100	4.5	4.5	22.7
	coffee	100	4.5	4.5	27.3
	cotton	100	4.5	4.5	31.8
	grapes	100	4.5	4.5	36.4
	jute	100	4.5	4.5	40.9
	kidney beans	100	4.5	4.5	45.5
	lentil	100	4.5	4.5	50.0
	maize	100	4.5	4.5	54.5
	mango	100	4.5	4.5	59.1
	moth beans	100	4.5	4.5	63.6
	mungbean	100	4.5	4.5	68.2
	muskmelon	100	4.5	4.5	72.7
	orange	100	4.5	4.5	77.3
	papaya	100	4.5	4.5	81.8
	pigeon peas	100	4.5	4.5	86.4
	pomegranate	100	4.5	4.5	90.9
	rice	100	4.5	4.5	95.5
	watermelon	100	4.5	4.5	100.0
	Total	2200	100.0	100.0	

⌚ Correlations (2-tailed Significance Test):

Correlations								
		Nitrogen	Phosphorus	Potassium	Temperature	Humidity	pH	Rainfall
Nitrogen	Pearson Correlation	1	-.104**	.215**	.010	.114**	.119**	-.071**
	Sig. (2-tailed)		<.001	<.001	.651	<.001	<.001	<.001
	N	2200	2200	2200	2200	2200	2200	2200
Phosphorus	Pearson Correlation	-.104**	1	.080**	-.127**	-.301	-.019	.008
	Sig. (2-tailed)	<.001		<.001	<.001	.368	.368	.707
	N	2200	2200	2200	2200	2200	2200	2200
Potassium	Pearson Correlation	.215**	.080**	1	-.209**	-.323*	-.046*	-.037
	Sig. (2-tailed)	<.001	<.001		<.001	.032	.032	.081
	N	2200	2200	2200	2200	2200	2200	2200
Temperature	Pearson Correlation	.010	-.127**	-.209**	1	.112	.011	-.167**
	Sig. (2-tailed)	.651	<.001	<.001		.614	.614	<.001
	N	2200	2200	2200	2200	2200	2200	2200
Humidity	Pearson Correlation	.114**	-.301**	.323**	-.112**	1	.027	.008
	Sig. (2-tailed)	<.001	<.001	<.001	<.001		.203	.713
	N	2200	2200	2200	2200	2200	2200	2200
pH	Pearson Correlation	.119**	-.019	-.046*	.011	.027	1	-.164**
	Sig. (2-tailed)	<.001	.368	.032	.614	.203		<.001
	N	2200	2200	2200	2200	2200	2200	2200
Rainfall	Pearson Correlation	-.071**	.008	-.037	-.167**	.008	-.164**	1
	Sig. (2-tailed)	<.001	.707	.081	<.001	.713	<.001	
	N	2200	2200	2200	2200	2200	2200	2200

- a. Correlation is significant at the 0.01 level (2-tailed).
- b. Correlation is significant at the 0.05 level (2-tailed).

⌚ Correlations (1-tailed Significance Test):

Correlations								
		Nitrogen	Phosphorus	Potassium	Temperature	Humidity	pH	Rainfall
Nitrogen	Pearson Correlation	1	-.104	.215	.010	.114	.119	-.071
	Sig. (1-tailed)		<.001	<.001	.325	<.001	<.001	<.001
	N	2200	2200	2200	2200	2200	2200	2200
Phosphorus	Pearson Correlation	-.104	1	.080	-.127	-.301	-.019	.008
	Sig. (1-tailed)	<.001		<.001	<.001	<.001	.184	.353
	N	2200	2200	2200	2200	2200	2200	2200
Potassium	Pearson Correlation	.215	.080	1	-.209	.323	-.046	-.037
	Sig. (1-tailed)	<.001	<.001		<.001	<.001	.016	.040

N		2200	2200	2200	2200	2200	2200	2200
<b>Temperature</b>	<b>Pearson Correlation</b>	.010	-.127	-.209	1	-.112	.011	-.167
	<b>Sig. (1-tailed)</b>	.325	<.001	<.001		<.001	.307	<.001
N		2200	2200	2200	2200	2200	2200	2200
<b>Humidity</b>	<b>Pearson Correlation</b>	.114	-.301	.323	-.112	1	.027	.008
	<b>Sig. (1-tailed)</b>	<.001	<.001	<.001	<.001		<.101	.356
N		2200	2200	2200	2200	2200	2200	2200
<b>pH</b>	<b>Pearson Correlation</b>	.119	-.019	-.046	.011	.027	1	-.164
	<b>Sig. (1-tailed)</b>	<.001	.184	.016	.307	.101		<.001
N		2200	2200	2200	2200	2200	2200	2200
<b>Rainfall</b>	<b>Pearson Correlation</b>	-.071	.008	-.037	-.167	.008	-.164	1
	<b>Sig. (1-tailed)</b>	<.001	.353	.040	<.001	.356	<.001	
N		2200	2200	2200	2200	2200	2200	2200

## Explore:

### Case Processing Summary

	Valid		Cases Missing		Total	
	N	Percent	N	Percent	N	Percent
<b>Rainfall</b>	<b>2200</b>	<b>100.0%</b>	<b>0</b>	<b>0.0%</b>	<b>2200</b>	<b>100.0%</b>
<b>Nitrogen</b>	<b>2200</b>	<b>100.0%</b>	<b>0</b>	<b>0.0%</b>	<b>2200</b>	<b>100.0%</b>
<b>Phosphorus</b>	<b>2200</b>	<b>100.0%</b>	<b>0</b>	<b>0.0%</b>	<b>2200</b>	<b>100.0%</b>
<b>Potassium</b>	<b>2200</b>	<b>100.0%</b>	<b>0</b>	<b>0.0%</b>	<b>2200</b>	<b>100.0%</b>
<b>Temperature</b>	<b>2200</b>	<b>100.0%</b>	<b>0</b>	<b>0.0%</b>	<b>2200</b>	<b>100.0%</b>
<b>Humidity</b>	<b>2200</b>	<b>100.0%</b>	<b>0</b>	<b>0.0%</b>	<b>2200</b>	<b>100.0%</b>
<b>pH</b>	<b>2200</b>	<b>100.0%</b>	<b>0</b>	<b>0.0%</b>	<b>2200</b>	<b>100.0%</b>

### (With Outlier)

#### Descriptives

		Statistic	Std. Error
<b>Rainfall</b>	<b>Mean</b>	<b>87.8402</b>	<b>.68703</b>
	<b>95% Confidence Interval for Mean</b>	<b>Lower Bound</b>	<b>86.4930</b>
		<b>Upper Bound</b>	<b>89.1875</b>
	<b>5% Trimmed Mean</b>		<b>87.5004</b>
	<b>Median</b>		<b>94.8676</b>
	<b>Variance</b>		<b>1038.411</b>
	<b>Std. Deviation</b>		<b>32.22439</b>
	<b>Minimum</b>		<b>20.21</b>
	<b>Maximum</b>		<b>166.64</b>
	<b>Range</b>		<b>146.43</b>
	<b>Interquartile Range</b>		<b>40.94</b>
	<b>Skewness</b>		<b>.002</b>
	<b>Kurtosis</b>		<b>.104</b>

Nitrogen	<b>Mean</b>		<b>50.5518</b>	<b>.78708</b>
	<b>95% Confidence Interval for Mean</b>	<b>Lower Bound</b>	<b>49.0083</b>	
		<b>Upper Bound</b>	<b>52.0953</b>	
	<b>5% Trimmed Mean</b>		<b>49.2667</b>	
	<b>Median</b>		<b>37.0000</b>	
	<b>Variance</b>		<b>1362.890</b>	
	<b>Std. Deviation</b>		<b>36.91733</b>	
	<b>Minimum</b>		<b>.00</b>	
	<b>Maximum</b>		<b>140.00</b>	
	<b>Range</b>		<b>140.00</b>	
	<b>Interquartile Range</b>		<b>63.75</b>	
	<b>Skewness</b>		<b>.510</b>	<b>.052</b>
	<b>Kurtosis</b>		<b>-1.058</b>	<b>.104</b>
Phosphorus	<b>Mean</b>		<b>46.3600</b>	<b>.45322</b>
	<b>95% Confidence Interval for Mean</b>	<b>Lower Bound</b>	<b>45.4712</b>	
		<b>Upper Bound</b>	<b>47.2488</b>	
	<b>5% Trimmed Mean</b>		<b>46.4803</b>	
	<b>Median</b>		<b>51.0000</b>	
	<b>Variance</b>		<b>451.898</b>	
	<b>Std. Deviation</b>		<b>21.25790</b>	
	<b>Minimum</b>		<b>5.00</b>	
	<b>Maximum</b>		<b>95.00</b>	
	<b>Range</b>		<b>90.00</b>	
	<b>Interquartile Range</b>		<b>32.00</b>	
	<b>Skewness</b>		<b>-.193</b>	<b>.052</b>
	<b>Kurtosis</b>		<b>-.877</b>	<b>.104</b>
Potassium	<b>Mean</b>		<b>34.3436</b>	<b>.35443</b>
	<b>95% Confidence Interval for Mean</b>	<b>Lower Bound</b>	<b>33.6486</b>	
		<b>Upper Bound</b>	<b>35.0387</b>	
	<b>5% Trimmed Mean</b>		<b>33.2641</b>	
	<b>Median</b>		<b>32.0000</b>	
	<b>Variance</b>		<b>276.359</b>	
	<b>Std. Deviation</b>		<b>16.62406</b>	
	<b>Minimum</b>		<b>5.00</b>	
	<b>Maximum</b>		<b>85.00</b>	
	<b>Range</b>		<b>80.00</b>	
	<b>Interquartile Range</b>		<b>28.14</b>	
	<b>Skewness</b>		<b>.758</b>	<b>.052</b>
	<b>Kurtosis</b>		<b>.386</b>	<b>.104</b>
Temperature	<b>Mean</b>		<b>25.4745</b>	<b>.08457</b>
	<b>95% Confidence Interval for Mean</b>	<b>Lower Bound</b>	<b>25.3087</b>	
		<b>Upper Bound</b>	<b>25.6404</b>	
	<b>5% Trimmed Mean</b>		<b>25.4545</b>	
	<b>Median</b>		<b>25.6100</b>	
	<b>Variance</b>		<b>15.734</b>	
	<b>Std. Deviation</b>		<b>3.96666</b>	

	<b>Minimum</b>	<b>15.54</b>	
	<b>Maximum</b>	<b>35.68</b>	
	<b>Range</b>	<b>20.14</b>	
	<b>Interquartile Range</b>	<b>5.05</b>	
	<b>Skewness</b>	<b>-.041</b>	<b>.052</b>
	<b>Kurtosis</b>	<b>-.199</b>	<b>.104</b>
<b>Humidity</b>	<b>Mean</b>	<b>76.2315</b>	<b>.31906</b>
	<b>95% Confidence Interval for Mean</b>	<b>Lower Bound</b>	<b>75.6058</b>
		<b>Upper Bound</b>	<b>76.8572</b>
	<b>5% Trimmed Mean</b>		<b>77.0204</b>
	<b>Median</b>		<b>80.4731</b>
	<b>Variance</b>		<b>223.962</b>
	<b>Std. Deviation</b>		<b>14.96536</b>
	<b>Minimum</b>		<b>30.40</b>
	<b>Maximum</b>		<b>99.98</b>
	<b>Range</b>		<b>69.58</b>
	<b>Interquartile Range</b>		<b>24.10</b>
	<b>Skewness</b>		<b>-.666</b>
	<b>Kurtosis</b>		<b>-.407</b>
<b>pH</b>	<b>Mean</b>		<b>6.4552</b>
	<b>95% Confidence Interval for Mean</b>	<b>Lower Bound</b>	<b>6.4288</b>
		<b>Upper Bound</b>	<b>6.4817</b>
	<b>5% Trimmed Mean</b>		<b>6.4491</b>
	<b>Median</b>		<b>6.4441</b>
	<b>Variance</b>		<b>.401</b>
	<b>Std. Deviation</b>		<b>.63330</b>
	<b>Minimum</b>		<b>4.72</b>
	<b>Maximum</b>		<b>8.15</b>
	<b>Range</b>		<b>3.43</b>
	<b>Interquartile Range</b>		<b>.86</b>
	<b>Skewness</b>		<b>.145</b>
	<b>Kurtosis</b>		<b>-.167</b>
			<b>.104</b>

**(Without Outlier)**

<b>Descriptives</b>			
		<b>Statistic</b>	<b>Std. Error</b>
<b>Nitrogen</b>	<b>Mean</b>	<b>50.5518</b>	<b>.78708</b>
	<b>95% Confidence Interval for Mean</b>	<b>Lower Bound</b>	<b>49.0083</b>
		<b>Upper Bound</b>	<b>52.0953</b>
	<b>5% Trimmed Mean</b>		<b>49.2667</b>
	<b>Median</b>		<b>37.0000</b>
	<b>Variance</b>		<b>1362.890</b>
	<b>Std. Deviation</b>		<b>36.91733</b>

	<b>Minimum</b>	.00	
	<b>Maximum</b>	<b>140.00</b>	
	<b>Range</b>	<b>140.00</b>	
	<b>Interquartile Range</b>	<b>63.75</b>	
	<b>Skewness</b>	<b>.510</b>	<b>.052</b>
	<b>Kurtosis</b>	<b>-1.058</b>	<b>.104</b>
<b>Phosphorus</b>	<b>Mean</b>	<b>46.3600</b>	<b>.45322</b>
	<b>95% Confidence</b>	<b>Lower Bound</b>	<b>45.4712</b>
	<b>Interval for Mean</b>	<b>Upper Bound</b>	<b>47.2488</b>
	<b>5% Trimmed Mean</b>	<b>46.4803</b>	
	<b>Median</b>	<b>51.0000</b>	
	<b>Variance</b>	<b>451.898</b>	
	<b>Std. Deviation</b>	<b>21.25790</b>	
	<b>Minimum</b>	<b>5.00</b>	
	<b>Maximum</b>	<b>95.00</b>	
	<b>Range</b>	<b>90.00</b>	
	<b>Interquartile Range</b>	<b>32.00</b>	
	<b>Skewness</b>	<b>-.193</b>	<b>.052</b>
	<b>Kurtosis</b>	<b>-.877</b>	<b>.104</b>
<b>Potassium</b>	<b>Mean</b>	<b>34.3436</b>	<b>.35443</b>
	<b>95% Confidence</b>	<b>Lower Bound</b>	<b>33.6486</b>
	<b>Interval for Mean</b>	<b>Upper Bound</b>	<b>35.0387</b>
	<b>5% Trimmed Mean</b>	<b>33.2641</b>	
	<b>Median</b>	<b>32.0000</b>	
	<b>Variance</b>	<b>276.359</b>	
	<b>Std. Deviation</b>	<b>16.62406</b>	
	<b>Minimum</b>	<b>5.00</b>	
	<b>Maximum</b>	<b>85.00</b>	
	<b>Range</b>	<b>80.00</b>	
	<b>Interquartile Range</b>	<b>28.14</b>	
	<b>Skewness</b>	<b>.758</b>	<b>.052</b>
	<b>Kurtosis</b>	<b>.386</b>	<b>.104</b>
<b>Temperature</b>	<b>Mean</b>	<b>25.4745</b>	<b>.08457</b>
	<b>95% Confidence</b>	<b>Lower Bound</b>	<b>25.3087</b>
	<b>Interval for Mean</b>	<b>Upper Bound</b>	<b>25.6404</b>
	<b>5% Trimmed Mean</b>	<b>25.4545</b>	
	<b>Median</b>	<b>25.6100</b>	
	<b>Variance</b>	<b>15.734</b>	
	<b>Std. Deviation</b>	<b>3.96666</b>	

	<b>Minimum</b>	<b>15.54</b>	
	<b>Maximum</b>	<b>35.68</b>	
	<b>Range</b>	<b>20.14</b>	
	<b>Interquartile Range</b>	<b>5.05</b>	
	<b>Skewness</b>	<b>-.041</b>	<b>.052</b>
	<b>Kurtosis</b>	<b>-.199</b>	<b>.104</b>
<b>Humidity</b>	<b>Mean</b>	<b>76.2315</b>	<b>.31906</b>
	<b>95% Confidence</b>	<b>Lower Bound</b>	<b>75.6058</b>
	<b>Interval for Mean</b>	<b>Upper Bound</b>	<b>76.8572</b>
	<b>5% Trimmed Mean</b>	<b>77.0204</b>	
	<b>Median</b>	<b>80.4731</b>	
	<b>Variance</b>	<b>223.962</b>	
	<b>Std. Deviation</b>	<b>14.96536</b>	
	<b>Minimum</b>	<b>30.40</b>	
	<b>Maximum</b>	<b>99.98</b>	
	<b>Range</b>	<b>69.58</b>	
	<b>Interquartile Range</b>	<b>24.10</b>	
	<b>Skewness</b>	<b>-.666</b>	<b>.052</b>
	<b>Kurtosis</b>	<b>-.407</b>	<b>.104</b>
<b>pH</b>	<b>Mean</b>	<b>6.4552</b>	<b>.01350</b>
	<b>95% Confidence</b>	<b>Lower Bound</b>	<b>6.4288</b>
	<b>Interval for Mean</b>	<b>Upper Bound</b>	<b>6.4817</b>
	<b>5% Trimmed Mean</b>	<b>6.4491</b>	
	<b>Median</b>	<b>6.4441</b>	
	<b>Variance</b>	<b>.401</b>	
	<b>Std. Deviation</b>	<b>.63330</b>	
	<b>Minimum</b>	<b>4.72</b>	
	<b>Maximum</b>	<b>8.15</b>	
	<b>Range</b>	<b>3.43</b>	
	<b>Interquartile Range</b>	<b>.86</b>	
	<b>Skewness</b>	<b>.145</b>	<b>.052</b>
	<b>Kurtosis</b>	<b>-.167</b>	<b>.104</b>
<b>Rainfall</b>	<b>Mean</b>	<b>87.8402</b>	<b>.68703</b>
	<b>95% Confidence</b>	<b>Lower Bound</b>	<b>86.4930</b>
	<b>Interval for Mean</b>	<b>Upper Bound</b>	<b>89.1875</b>
	<b>5% Trimmed Mean</b>	<b>87.5004</b>	
	<b>Median</b>	<b>94.8676</b>	
	<b>Variance</b>	<b>1038.411</b>	
	<b>Std. Deviation</b>	<b>32.22439</b>	

<b>Minimum</b>	<b>20.21</b>	
<b>Maximum</b>	<b>166.64</b>	
<b>Range</b>	<b>146.43</b>	
<b>Interquartile Range</b>	<b>40.94</b>	
<b>Skewness</b>	<b>.002</b>	<b>.052</b>
<b>Kurtosis</b>	<b>-.375</b>	<b>.104</b>

**(Without Outlier)**

**Extreme Values**

			<b>Case Number</b>	<b>Value</b>
<b>Rainfall</b>	<b>Highest</b>	<b>1</b>	<b>2046</b>	<b>166.64</b>
		<b>2</b>	<b>1900</b>	<b>166.57</b>
		<b>3</b>	<b>2195</b>	<b>166.25</b>
		<b>4</b>	<b>2044</b>	<b>166.22</b>
		<b>5</b>	<b>2039</b>	<b>166.14</b>
	<b>Lowest</b>	<b>1</b>	<b>1445</b>	<b>20.21</b>
		<b>2</b>	<b>1425</b>	<b>20.36</b>
		<b>3</b>	<b>1464</b>	<b>20.39</b>
		<b>4</b>	<b>1447</b>	<b>20.49</b>
		<b>5</b>	<b>1455</b>	<b>20.66</b>
<b>Nitrogen</b>	<b>Highest</b>	<b>1</b>	<b>1913</b>	<b>140.00</b>
		<b>2</b>	<b>1951</b>	<b>140.00</b>
		<b>3</b>	<b>1979</b>	<b>140.00</b>
		<b>4</b>	<b>1929</b>	<b>139.00</b>
		<b>5</b>	<b>1902</b>	<b>136.00</b>
	<b>Lowest</b>	<b>1</b>	<b>1879</b>	<b>.00</b>
		<b>2</b>	<b>1875</b>	<b>.00</b>
		<b>3</b>	<b>1858</b>	<b>.00</b>
		<b>4</b>	<b>1816</b>	<b>.00</b>
		<b>5</b>	<b>1642</b>	<b>.00</b>
<b>Phosphorus</b>	<b>Highest</b>	<b>1</b>	<b>1002</b>	<b>95.00</b>
		<b>2</b>	<b>1015</b>	<b>95.00</b>
		<b>3</b>	<b>1017</b>	<b>95.00</b>
		<b>4</b>	<b>1049</b>	<b>95.00</b>
		<b>5</b>	<b>1001</b>	<b>94.00</b>
	<b>Lowest</b>	<b>1</b>	<b>1899</b>	<b>5.00</b>
		<b>2</b>	<b>1878</b>	<b>5.00</b>
		<b>3</b>	<b>1842</b>	<b>5.00</b>
		<b>4</b>	<b>1807</b>	<b>5.00</b>
		<b>5</b>	<b>1671</b>	<b>5.00</b>
<b>Potassium</b>	<b>Highest</b>	<b>1</b>	<b>203</b>	<b>85.00</b>
		<b>2</b>	<b>204</b>	<b>85.00</b>
		<b>3</b>	<b>214</b>	<b>85.00</b>

	<b>4</b>	<b>229</b>	<b>85.00</b>
	<b>5</b>	<b>232</b>	<b>85.00</b>
<b>Temperature</b>	<b>Lowest</b> <b>1</b>	<b>1696</b>	<b>5.00</b>
	<b>2</b>	<b>1680</b>	<b>5.00</b>
	<b>3</b>	<b>1674</b>	<b>5.00</b>
	<b>4</b>	<b>1651</b>	<b>5.00</b>
	<b>5</b>	<b>1639</b>	<b>5.00</b>
	<b>Highest</b> <b>1</b>	<b>1770</b>	<b>35.68</b>
<b>Humidity</b>	<b>2</b>	<b>1170</b>	<b>35.64</b>
	<b>3</b>	<b>1194</b>	<b>35.54</b>
	<b>4</b>	<b>1180</b>	<b>35.47</b>
	<b>5</b>	<b>411</b>	<b>35.46</b>
	<b>Lowest</b> <b>1</b>	<b>344</b>	<b>15.54</b>
	<b>2</b>	<b>1621</b>	<b>15.63</b>
	<b>3</b>	<b>327</b>	<b>15.77</b>
	<b>4</b>	<b>1601</b>	<b>15.78</b>
	<b>5</b>	<b>339</b>	<b>15.79</b>
	<b>Highest</b> <b>1</b>	<b>1890</b>	<b>99.98</b>
<b>pH</b>	<b>2</b>	<b>1865</b>	<b>99.97</b>
	<b>3</b>	<b>1893</b>	<b>99.85</b>
	<b>4</b>	<b>1892</b>	<b>99.72</b>
	<b>5</b>	<b>1815</b>	<b>99.66</b>
	<b>Lowest</b> <b>1</b>	<b>441</b>	<b>30.40</b>
	<b>2</b>	<b>440</b>	<b>30.99</b>
	<b>3</b>	<b>456</b>	<b>31.95</b>
	<b>4</b>	<b>438</b>	<b>32.25</b>
	<b>5</b>	<b>452</b>	<b>32.32</b>
	<b>Highest</b> <b>1</b>	<b>505</b>	<b>8.15</b>
	<b>2</b>	<b>218</b>	<b>8.14</b>
	<b>3</b>	<b>293</b>	<b>8.14</b>
	<b>4</b>	<b>225</b>	<b>8.10</b>
	<b>5</b>	<b>244</b>	<b>8.08</b>
	<b>Lowest</b> <b>1</b>	<b>449</b>	<b>4.72</b>
	<b>2</b>	<b>475</b>	<b>4.75</b>
	<b>3</b>	<b>1173</b>	<b>4.75</b>
	<b>4</b>	<b>431</b>	<b>4.75</b>
	<b>5</b>	<b>1158</b>	<b>4.75</b>

- a. Only a partial list of cases with the value **136.00** are shown in the table of upper extremes.
- b. Only a partial list of cases with the value **.00** are shown in the table of lower extremes.
- c. Only a partial list of cases with the value **94.00** are shown in the table of upper extremes.
- d. Only a partial list of cases with the value **5.00** are shown in the table of lower extremes.
- e. Only a partial list of cases with the value **85.00** are shown in the table of upper extremes.

**(With Outlier)**

Extreme Values				
		Case Number	Value	
<b>Nitrogen</b>	<b>Highest</b>	<b>1</b>	<b>1913</b>	<b>140.00</b>
		<b>2</b>	<b>1951</b>	<b>140.00</b>
		<b>3</b>	<b>1979</b>	<b>140.00</b>
		<b>4</b>	<b>1929</b>	<b>139.00</b>
		<b>5</b>	<b>1902</b>	<b>136.00</b>
	<b>Lowest</b>	<b>1</b>	<b>1879</b>	<b>.00</b>
		<b>2</b>	<b>1875</b>	<b>.00</b>
		<b>3</b>	<b>1858</b>	<b>.00</b>
		<b>4</b>	<b>1816</b>	<b>.00</b>
		<b>5</b>	<b>1642</b>	<b>.00</b>
<b>Phosphorus</b>	<b>Highest</b>	<b>1</b>	<b>1212</b>	<b>145.00</b>
		<b>2</b>	<b>1221</b>	<b>145.00</b>
		<b>3</b>	<b>1275</b>	<b>145.00</b>
		<b>4</b>	<b>1285</b>	<b>145.00</b>
		<b>5</b>	<b>1559</b>	<b>145.00</b>
	<b>Lowest</b>	<b>1</b>	<b>1899</b>	<b>5.00</b>
		<b>2</b>	<b>1878</b>	<b>5.00</b>
		<b>3</b>	<b>1842</b>	<b>5.00</b>
		<b>4</b>	<b>1807</b>	<b>5.00</b>
		<b>5</b>	<b>1671</b>	<b>5.00</b>
<b>Potassium</b>	<b>Highest</b>	<b>1</b>	<b>1203</b>	<b>205.00</b>
		<b>2</b>	<b>1212</b>	<b>205.00</b>
		<b>3</b>	<b>1218</b>	<b>205.00</b>
		<b>4</b>	<b>1226</b>	<b>205.00</b>
		<b>5</b>	<b>1264</b>	<b>205.00</b>
	<b>Lowest</b>	<b>1</b>	<b>1696</b>	<b>5.00</b>
		<b>2</b>	<b>1680</b>	<b>5.00</b>
		<b>3</b>	<b>1674</b>	<b>5.00</b>
		<b>4</b>	<b>1651</b>	<b>5.00</b>
		<b>5</b>	<b>1639</b>	<b>5.00</b>
<b>Temperature</b>	<b>Highest</b>	<b>1</b>	<b>1744</b>	<b>43.68</b>
		<b>2</b>	<b>1762</b>	<b>43.36</b>
		<b>3</b>	<b>1723</b>	<b>43.30</b>
		<b>4</b>	<b>1751</b>	<b>43.08</b>
		<b>5</b>	<b>1767</b>	<b>43.04</b>
	<b>Lowest</b>	<b>1</b>	<b>1215</b>	<b>8.83</b>
		<b>2</b>	<b>1212</b>	<b>9.47</b>

		<b>3</b>	<b>1294</b>	<b>9.54</b>
		<b>4</b>	<b>1292</b>	<b>9.72</b>
		<b>5</b>	<b>1296</b>	<b>9.85</b>
<b>Humidity</b>	<b>Highest</b>	<b>1</b>	<b>1890</b>	<b>99.98</b>
		<b>2</b>	<b>1865</b>	<b>99.97</b>
		<b>3</b>	<b>1893</b>	<b>99.85</b>
		<b>4</b>	<b>1892</b>	<b>99.72</b>
		<b>5</b>	<b>1815</b>	<b>99.66</b>
	<b>Lowest</b>	<b>1</b>	<b>231</b>	<b>14.26</b>
		<b>2</b>	<b>246</b>	<b>14.27</b>
		<b>3</b>	<b>271</b>	<b>14.28</b>
		<b>4</b>	<b>220</b>	<b>14.32</b>
		<b>5</b>	<b>297</b>	<b>14.34</b>
<b>pH</b>	<b>Highest</b>	<b>1</b>	<b>595</b>	<b>9.94</b>
		<b>2</b>	<b>519</b>	<b>9.93</b>
		<b>3</b>	<b>508</b>	<b>9.68</b>
		<b>4</b>	<b>547</b>	<b>9.46</b>
		<b>5</b>	<b>564</b>	<b>9.42</b>
	<b>Lowest</b>	<b>1</b>	<b>558</b>	<b>3.50</b>
		<b>2</b>	<b>530</b>	<b>3.51</b>
		<b>3</b>	<b>583</b>	<b>3.53</b>
		<b>4</b>	<b>600</b>	<b>3.53</b>
		<b>5</b>	<b>562</b>	<b>3.56</b>
<b>Rainfall</b>	<b>Highest</b>	<b>1</b>	<b>44</b>	<b>298.56</b>
		<b>2</b>	<b>39</b>	<b>298.40</b>
		<b>3</b>	<b>97</b>	<b>295.92</b>
		<b>4</b>	<b>73</b>	<b>295.61</b>
		<b>5</b>	<b>20</b>	<b>291.30</b>
	<b>Lowest</b>	<b>1</b>	<b>1445</b>	<b>20.21</b>
		<b>2</b>	<b>1425</b>	<b>20.36</b>
		<b>3</b>	<b>1464</b>	<b>20.39</b>
		<b>4</b>	<b>1447</b>	<b>20.49</b>
		<b>5</b>	<b>1455</b>	<b>20.66</b>

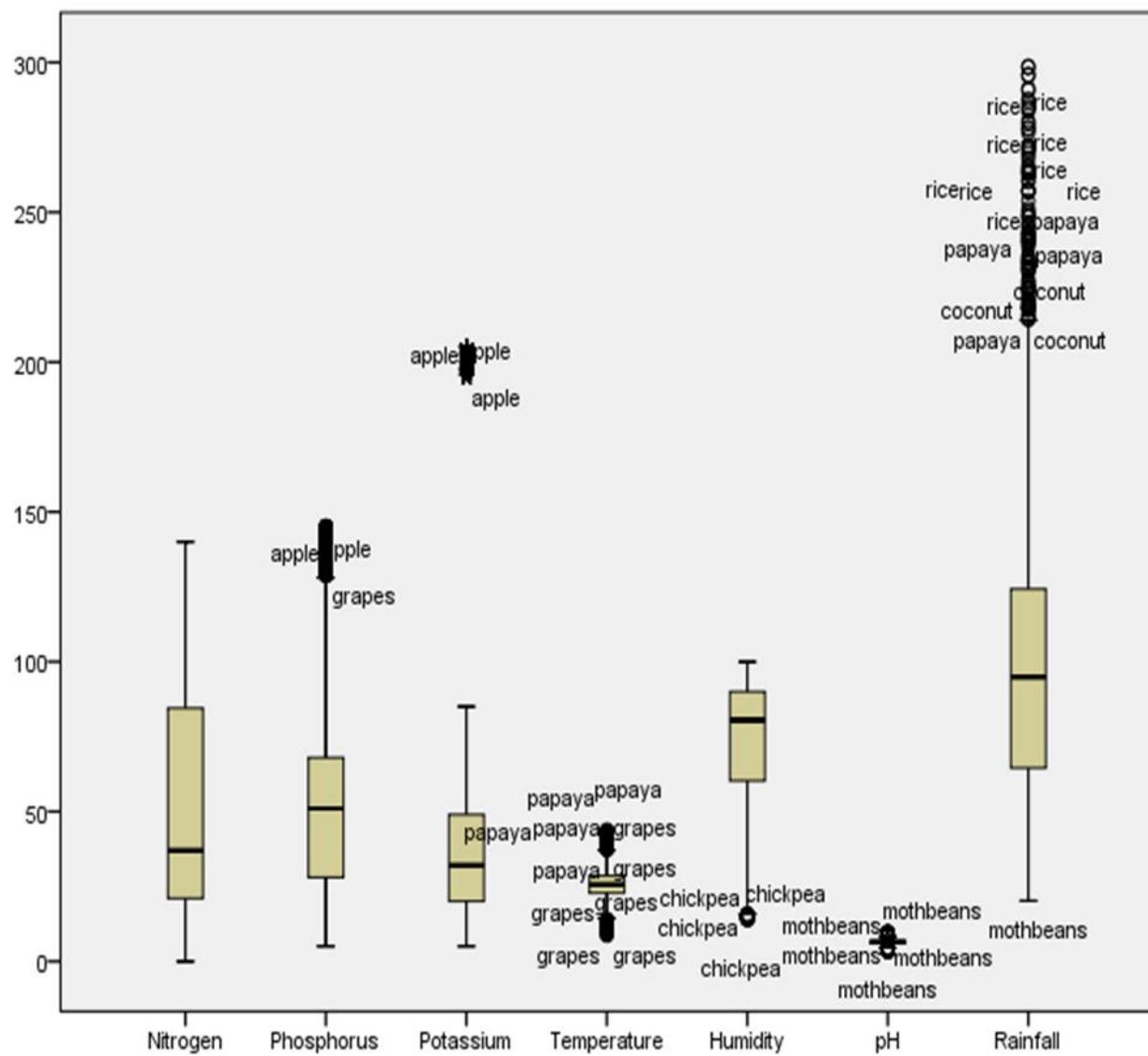
- a. Only a partial list of cases with the value **136.00** are shown in the table of upper extremes.
- b. Only a partial list of cases with the value **.00** are shown in the table of lower extremes.
- c. Only a partial list of cases with the value **145.00** are shown in the table of upper extremes.
- d. Only a partial list of cases with the value **5.00** are shown in the table of lower extremes.
- e. Only a partial list of cases with the value **205.00** are shown in the table of upper extremes.

🔗 Explore:

⌚ (With Outlier Box Plot):

Case Processing Summary

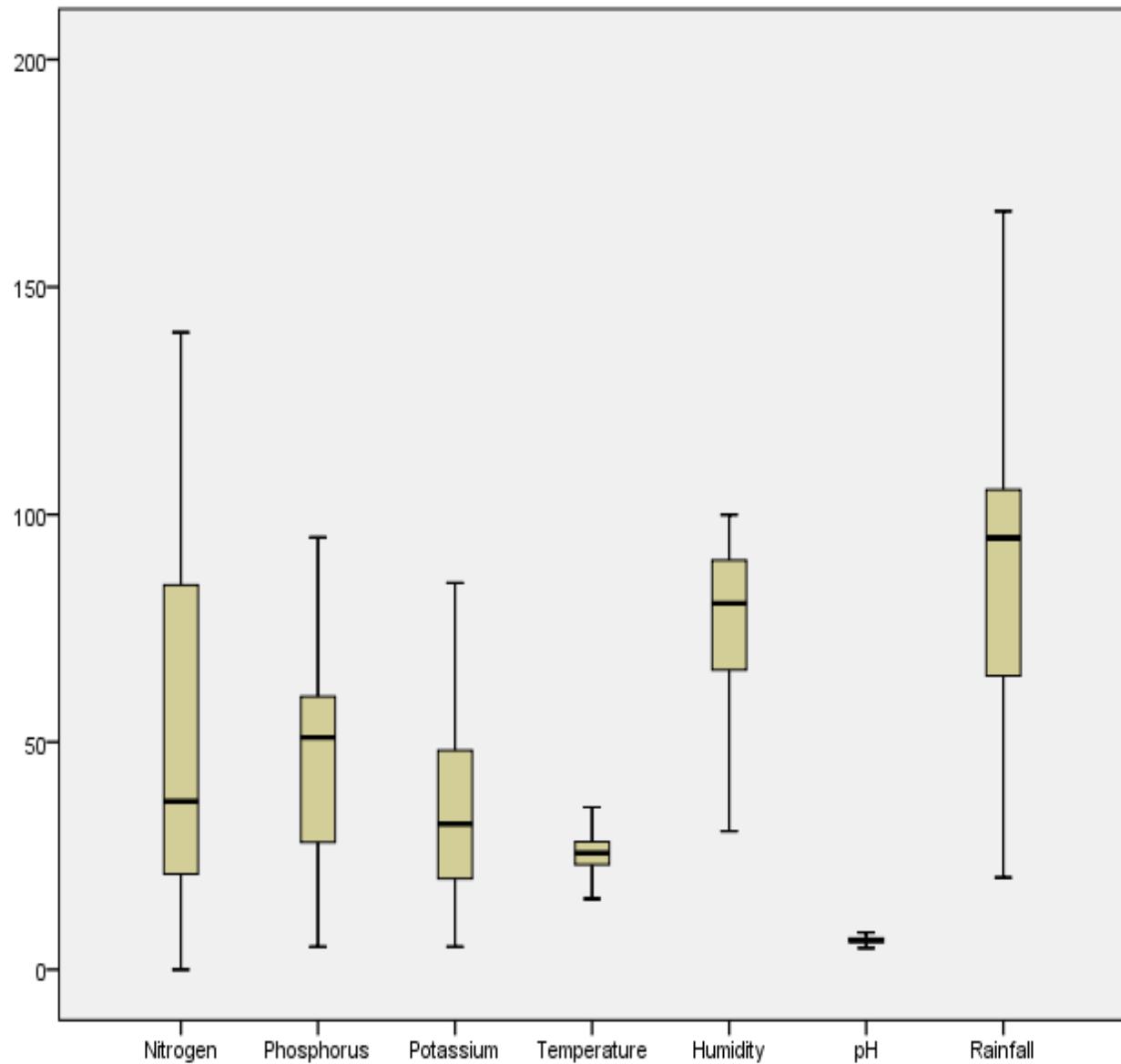
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
Rainfall	2200	100.0%	0	0.0%	2200	100.0%
Nitrogen	2200	100.0%	0	0.0%	2200	100.0%
Phosphorus	2200	100.0%	0	0.0%	2200	100.0%
Potassium	2200	100.0%	0	0.0%	2200	100.0%
Temperature	2200	100.0%	0	0.0%	2200	100.0%
Humidity	2200	100.0%	0	0.0%	2200	100.0%
pH	2200	100.0%	0	0.0%	2200	100.0%



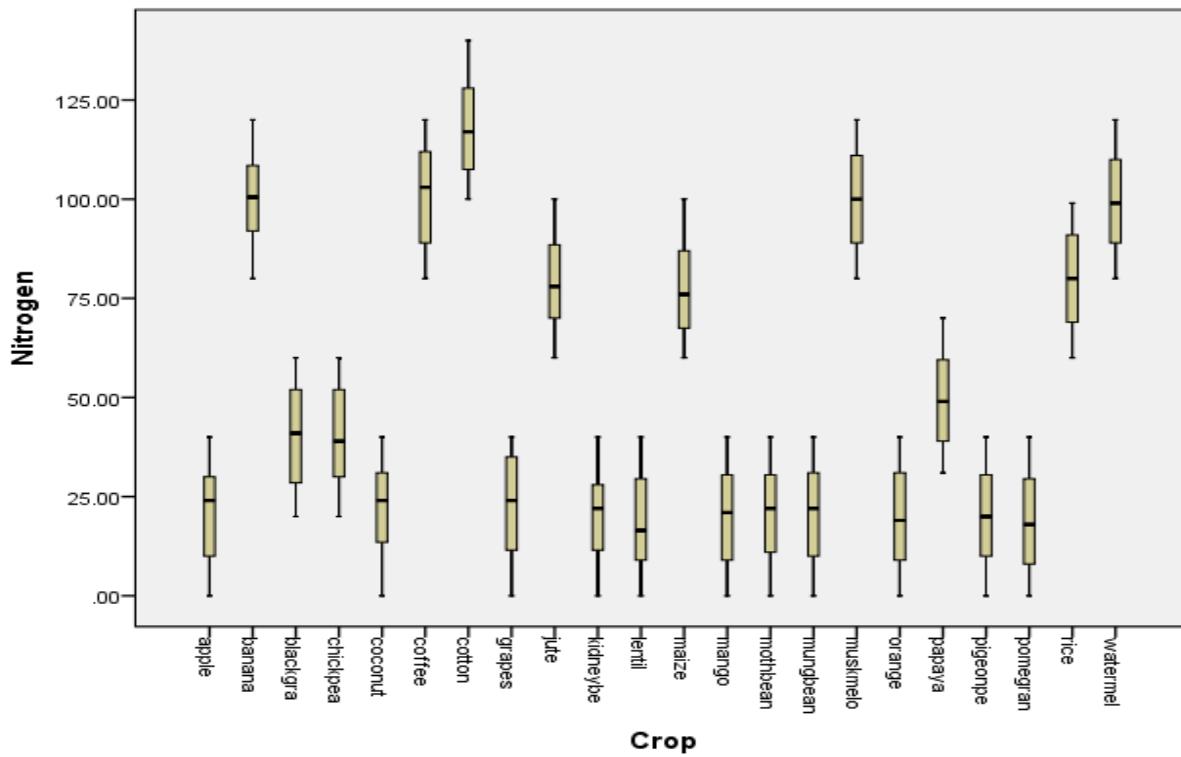
❖ (Without Outlier Box Plot):

### Case Processing Summary

	Valid		Cases Missing		Total	
	N	Percent	N	Percent	N	Percent
Rainfall	2200	100.0%	0	0.0%	2200	100.0%
Nitrogen	2200	100.0%	0	0.0%	2200	100.0%
Phosphorus	2200	100.0%	0	0.0%	2200	100.0%
Potassium	2200	100.0%	0	0.0%	2200	100.0%
Temperature	2200	100.0%	0	0.0%	2200	100.0%
Humidity	2200	100.0%	0	0.0%	2200	100.0%
pH	2200	100.0%	0	0.0%	2200	100.0%



❖ **Box Plot:**  
 ❖ **Nitrogen:**



**(With Outlier)**

**Nitrogen Stem-and-Leaf Plot**  
**Frequency Stem & Leaf**

121.00	0 .
000000000000011111111112222222222233333333444444444444	
143.00	0 .
55555555555566666666666677777777788888888889999999999999999	
127.00	1 .
0000000000011111111111222222222333333333444444444444	
110.00	1 . 5555555666666666777777778888888899999999999
164.00	2 .
00000000000000001111111111222222222222223333333333344	
44444444444	
177.00	2 .
555555555555566666666666667777777777778888888888888	
899999999999999999	
172.00	3 .
00000000000111111111111112222222222233333333334444	
4444444444444	
175.00	3 .
555555555555566666666666667777777777788888888889999	
9999999999999999	
79.00	4 . 000000000000000011222233344444
24.00	4 . 5577899999&

33.00	5 . 000012222233444
47.00	5 . 556666777778888899999
54.00	6 . 0000000000111111222333334
47.00	6 . 5556666777777888899999
44.00	7 . 000001111222333444444
46.00	7 . 5555666666777788889999
87.00	8 . 0000000111111122222222333333334444444
79.00	8 . 5555556666666777778888899999999999
78.00	9 . 00000000011111111122222333333344444
79.00	9 . 5555555555566677778888899999999999
69.00	10 . 0000000001111111222222333344444
65.00	10 . 55556666677777788888889999
61.00	11 . 00001111111122223333344444
62.00	11 . 55566666777777788888899999
24.00	12 . 00000001123
11.00	12 . 56679
15.00	13 . 1112334&
4.00	13 . 6&
3.00	14 . 0

Stem width: 10.00

Each leaf: 2 case(s)

& denotes fractional leaves.



**(Without Outlier)**

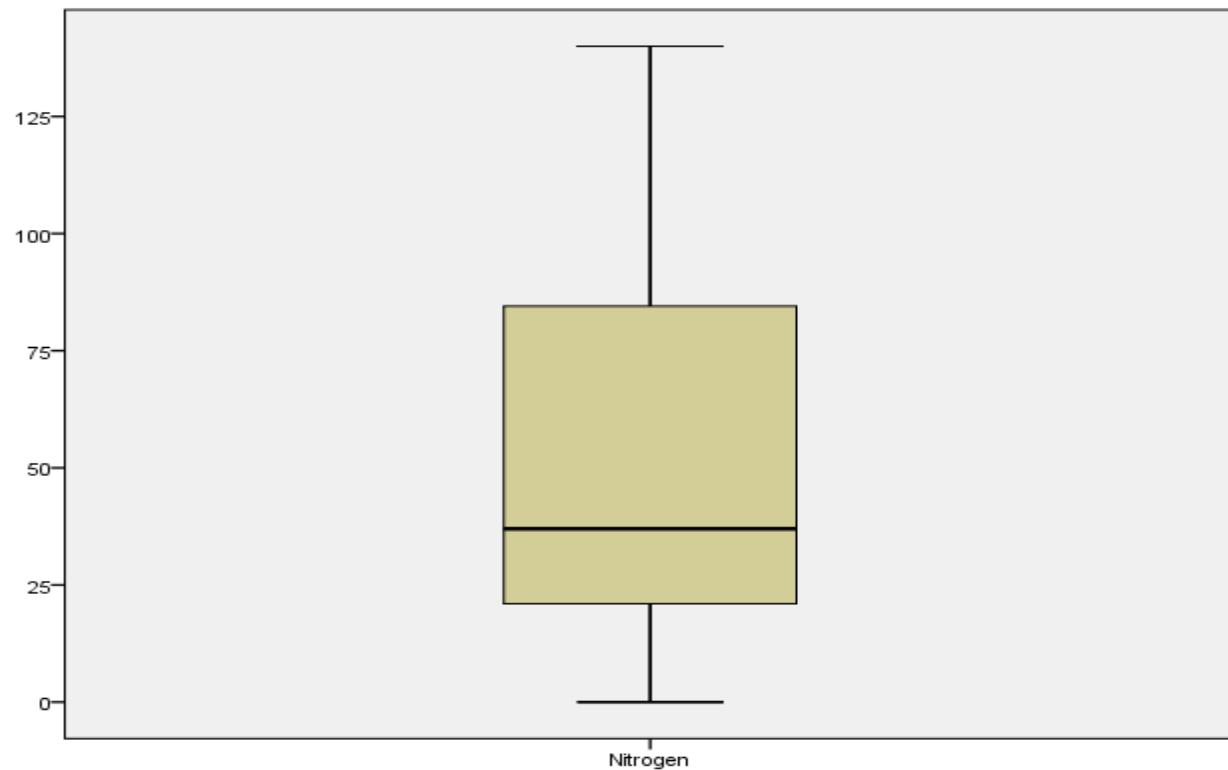
**Nitrogen Stem-and-Leaf Plot**  
**Frequency   Stem & Leaf**

121.00    0 .  
00000000000001111111112222222222233333333444444444444  
143.00    0 .  
5555555555556666666666667777777788888888899999999999999  
127.00    1 .  
00000000000111111111122222222333333333444444444444  
110.00    1 . 55555566666666777777778888888899999999999  
164.00    2 .  
00000000000000001111111111222222222222222333333333344  
444444444444  
177.00    2 .  
5555555555555666666666666677777777777888888888888888  
899999999999999999  
172.00    3 .  
00000000000011111111111111122222222222233333333334444  
44444444444444  
175.00    3 .  
55555555555556666666666666777777777778888888888889999  
999999999999999  
79.00    4 . 0000000000000000000011222233344444  
24.00    4 . 5577899999&  
33.00    5 . 0000122223344  
47.00    5 . 5566667777888889999  
54.00    6 . 00000000011111222333334  
47.00    6 . 55566667777788889999  
44.00    7 . 00000111122233344444  
46.00    7 . 5556666677778888999  
87.00    8 . 00000011111112222222333333334444444  
79.00    8 . 55555566666677777888889999999999  
78.00    9 . 000000001111111122222333333344444  
79.00    9 . 5555555555666777778888889999999999  
69.00    10 . 000000000111111122222333344444  
65.00    10 . 555566667777778888889999  
61.00    11 . 00000111111122223333344444  
62.00    11 . 5556666777777788888899999  
24.00    12 . 00000001123  
11.00    12 . 56679  
15.00    13 . 1112334&  
4.00    13 . 6&  
3.00    14 . 0

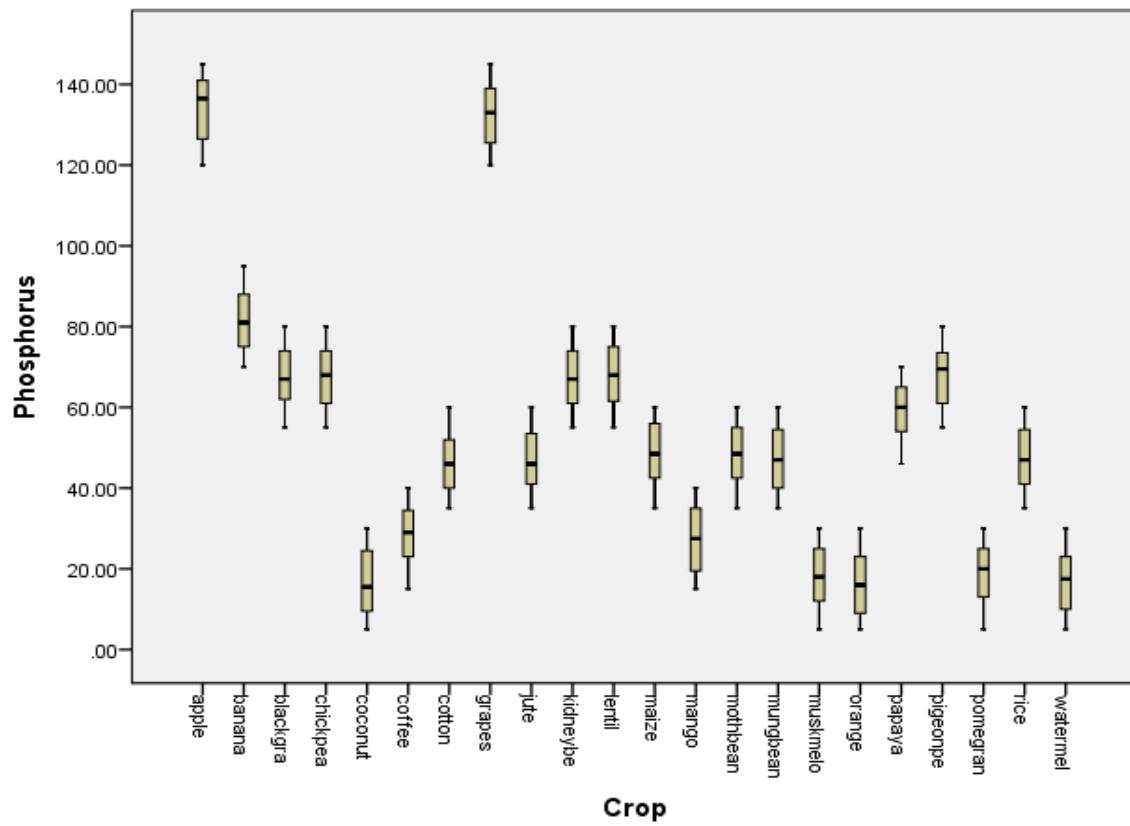
**Stem width: 10.00**

**Each leaf: 2 case(s)**

**& denotes fractional leaves.**



### ❖ Phosphorus:



**(With Outlier)**

**Phosphorus Stem-and-Leaf Plot**

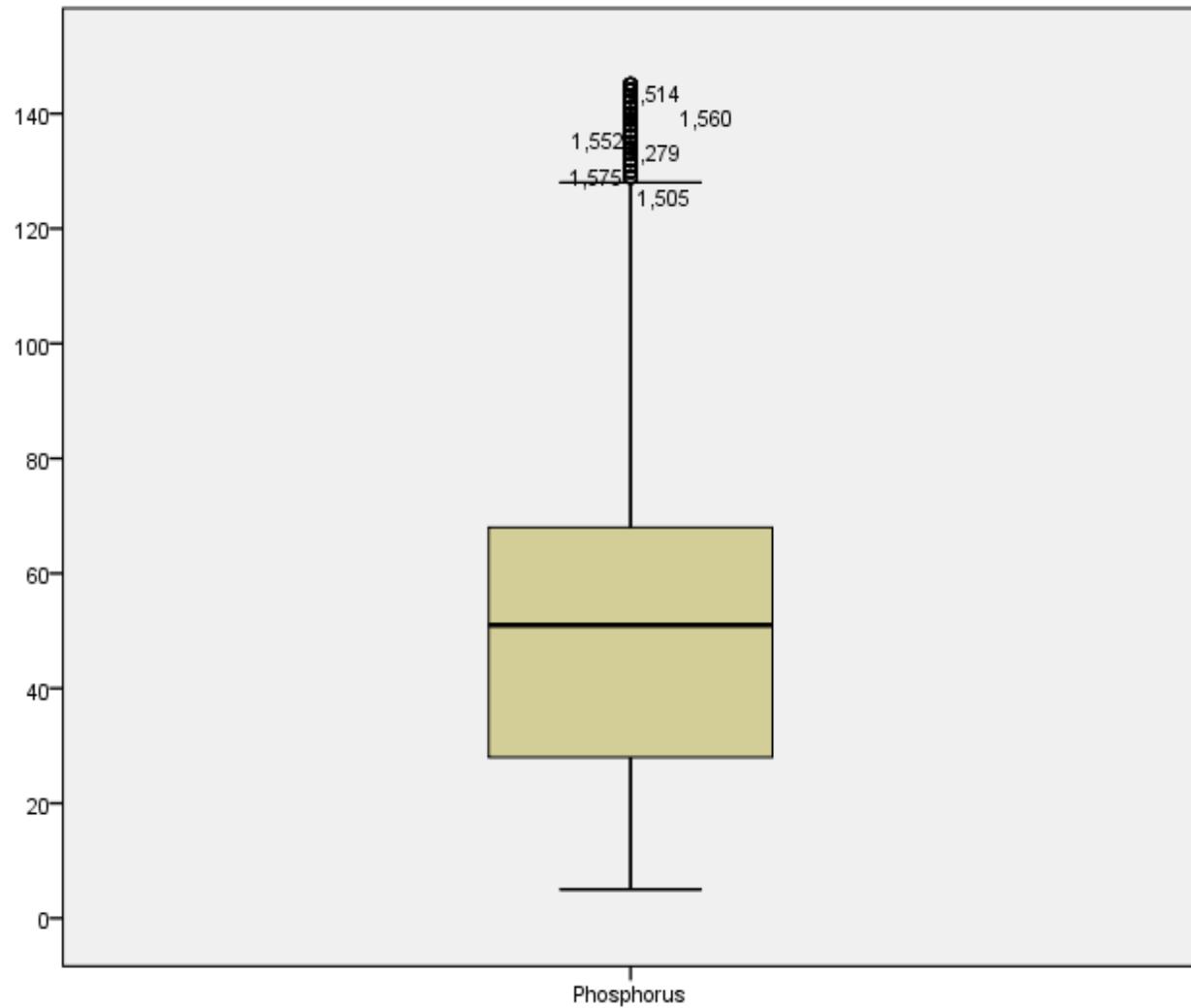
**Frequency   Stem & Leaf**

.00	0 .
108.00	0 . 555555566666666677777778888888999999
86.00	1 . 000001111112222233333444444
124.00	1 . 55555556666667777778888888888999999
138.00	2 . 000000011111111111222222333333334444444
132.00	2 . 5555555555566666677777788888899999999
61.00	3 . 0000000000111233344
159.00	3 . 5555555555566666666667777778888888899999999
128.00	4 . 000000000000111111112222333333334444444
126.00	4 . 5555555555566666677777788888889999999
119.00	5 . 0000000111111112222223333334444444
221.00	5 .
5555555555555666666666666777777777888888888899999999	
9999	
153.00	6 . 00000000000000000011111112222223333334444444
126.00	6 . 5555555556666677777778888888999999
125.00	7 . 00000001111111222222233333334444444
120.00	7 . 55555556666666777777888888999999999
30.00	8 . 00000001123&
24.00	8 . 55667889
16.00	9 . 01244&
4.00	9 . 5
.00	10 .
.00	10 .
.00	11 .
.00	11 .
40.00	12 . 0001112223334
22.00	12 . 5566788
138.00	Extremes (≥129)

**Stem width:** 10.00

**Each leaf:** 3 case(s)

& denotes fractional leaves.



### **(Without Outlier)**

## **Phosphorus Stem-and-Leaf Plot**

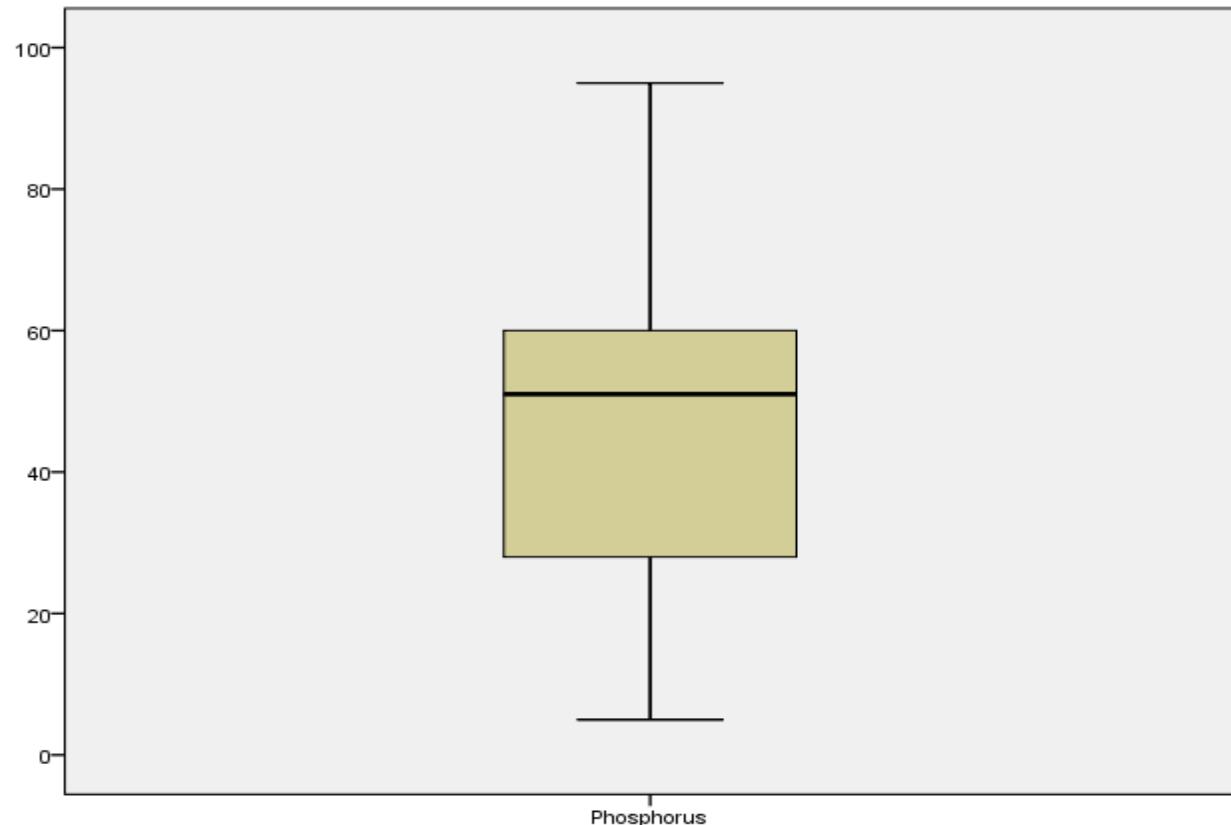
### **Frequency Stem & Leaf**

<b>125.00</b>	<b>7 . 000001111122222333334444</b>
<b>120.00</b>	<b>7 . 555556666777778888999999</b>
<b>30.00</b>	<b>8 . 00001&amp;</b>
<b>24.00</b>	<b>8 . 56789</b>
<b>16.00</b>	<b>9 . 124&amp;</b>
<b>4.00</b>	<b>9 . 5</b>

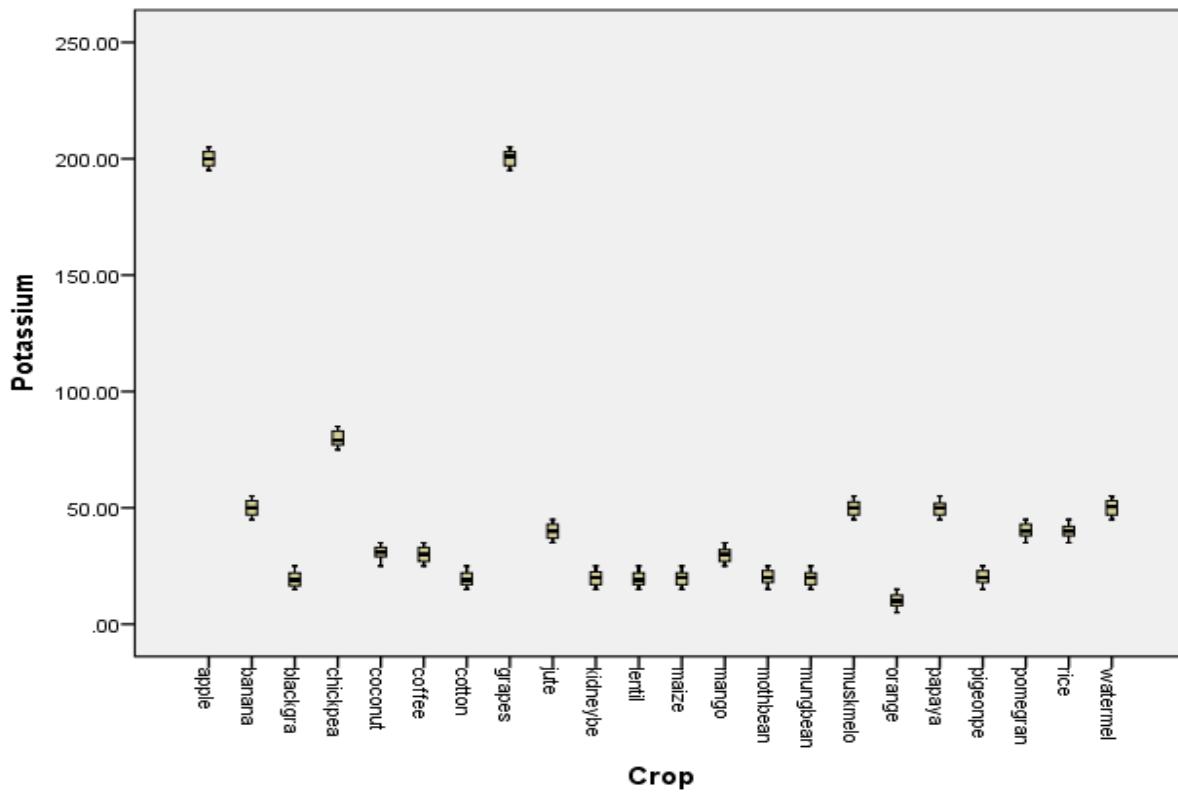
**Stem width:** **10.00**

**Each leaf:** **5 case(s)**

**& denotes fractional leaves.**



**§ Potassium:**



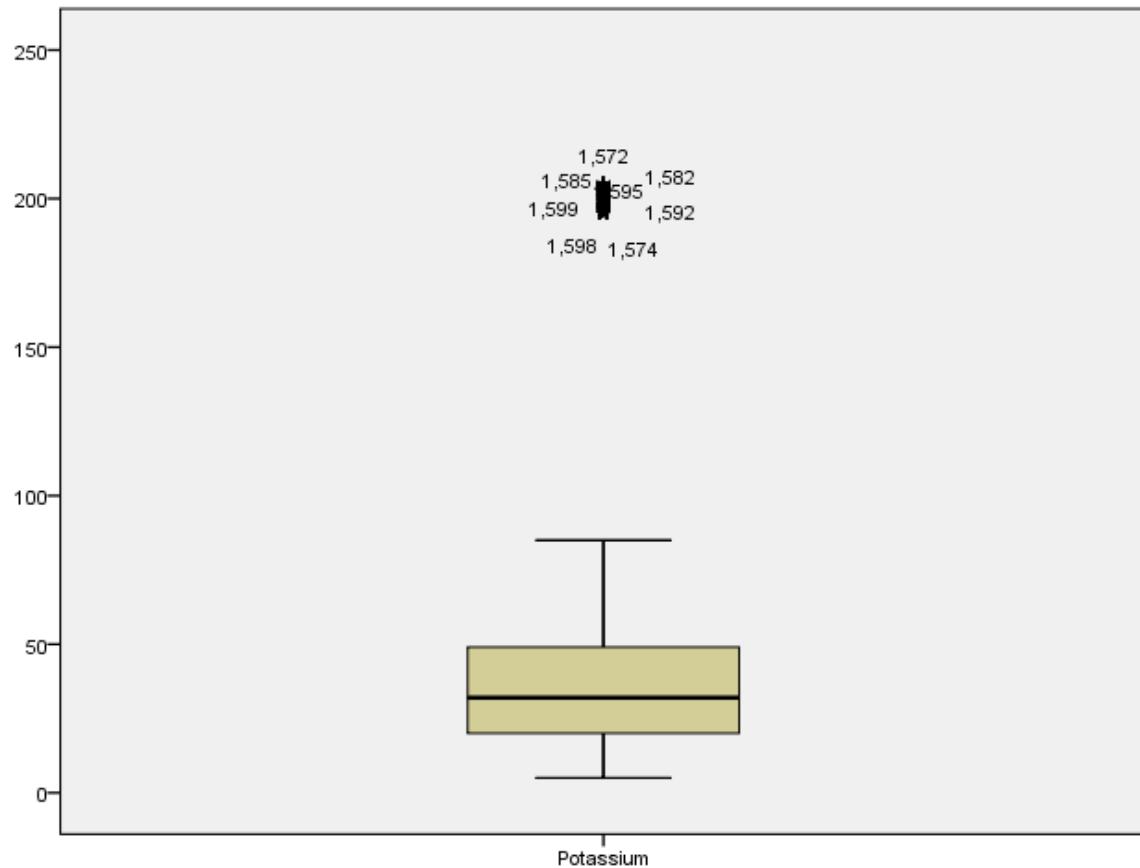
### (With Outlier)

#### Potassium Stem-and-Leaf Plot

Frequency    Stem & Leaf

.00      0 .  
 46.00    0 . 55667888999  
 45.00    1 . 00011223344  
 387.00   1 .  
 5555555555555555555666666666666677777777777777777788888888888  
 888888999999999999999999999  
 363.00   2 .  
 00000000000000000001111111111111112222222222222222333333333  
 3333334444444444444444  
 182.00   2 . 55555555555555566666666777788888999999  
 146.00   3 . 00000000111111122222233333344444  
 166.00   3 . 555555555556666677778888888899999  
 141.00   4 . 00000001111112222223333333444444  
 196.00   4 . 55555555555566667777777788888899999  
 184.00   5 . 00000001111111222222222233333333444444  
 44.00    5 . 5555555555  
 .00      6 .  
 .00      6 .  
 .00      7 .  
 52.00    7 . 556677788899  
 36.00    8 . 011223344  
 12.00    8 . 555  
**200.00 Extremes (≥195)**

**Stem width:** 10.00  
**Each leaf:** 4 case(s)



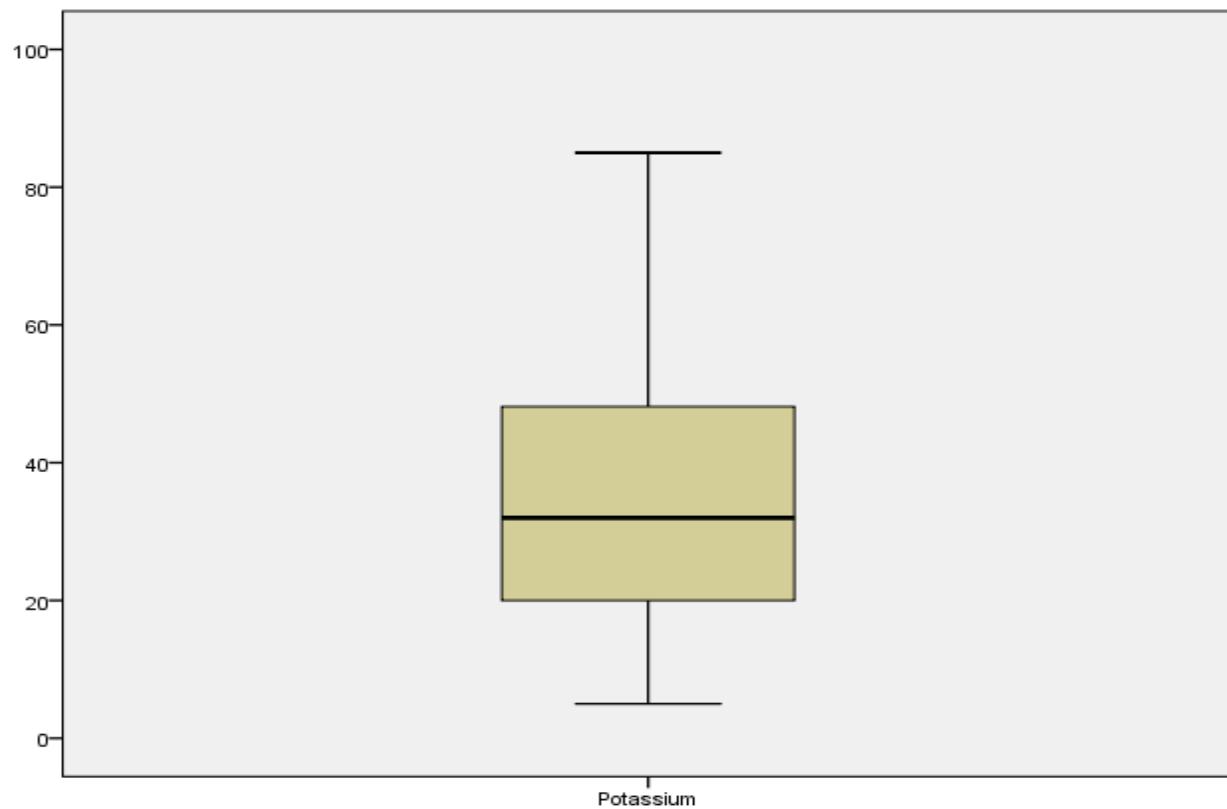
### **(Without Outlier)**

## Potassium Stem-and-Leaf Plot

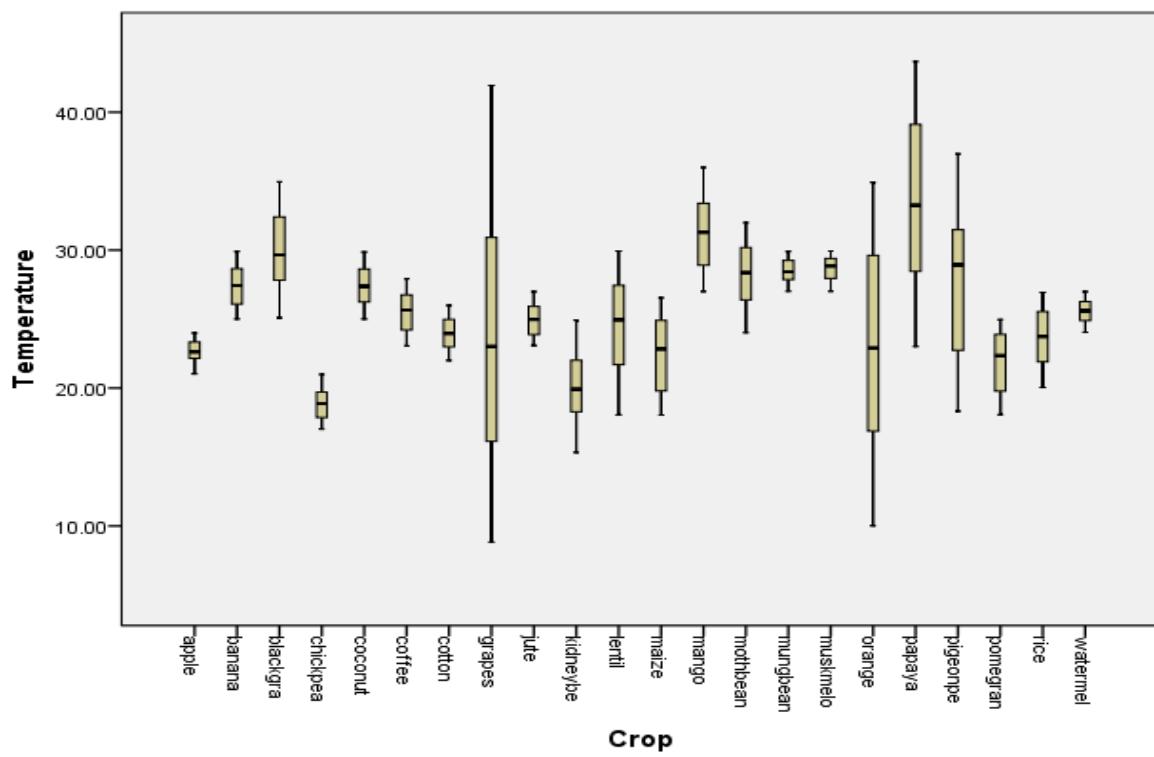
### Frequency Stem & Leaf

**184.00**    5 . 000000111112222222222333333444444  
**44.00**    5 . 555555555  
.00    6 .  
.00    6 .  
.00    7 .  
**52.00**    7 . 55667788899  
**36.00**    8 . 011223344  
**12.00**    8 . 55

**Stem width:**    10.00  
**Each leaf:**    5 case(s)



**♂ Temperature:**



**(With Outlier)**

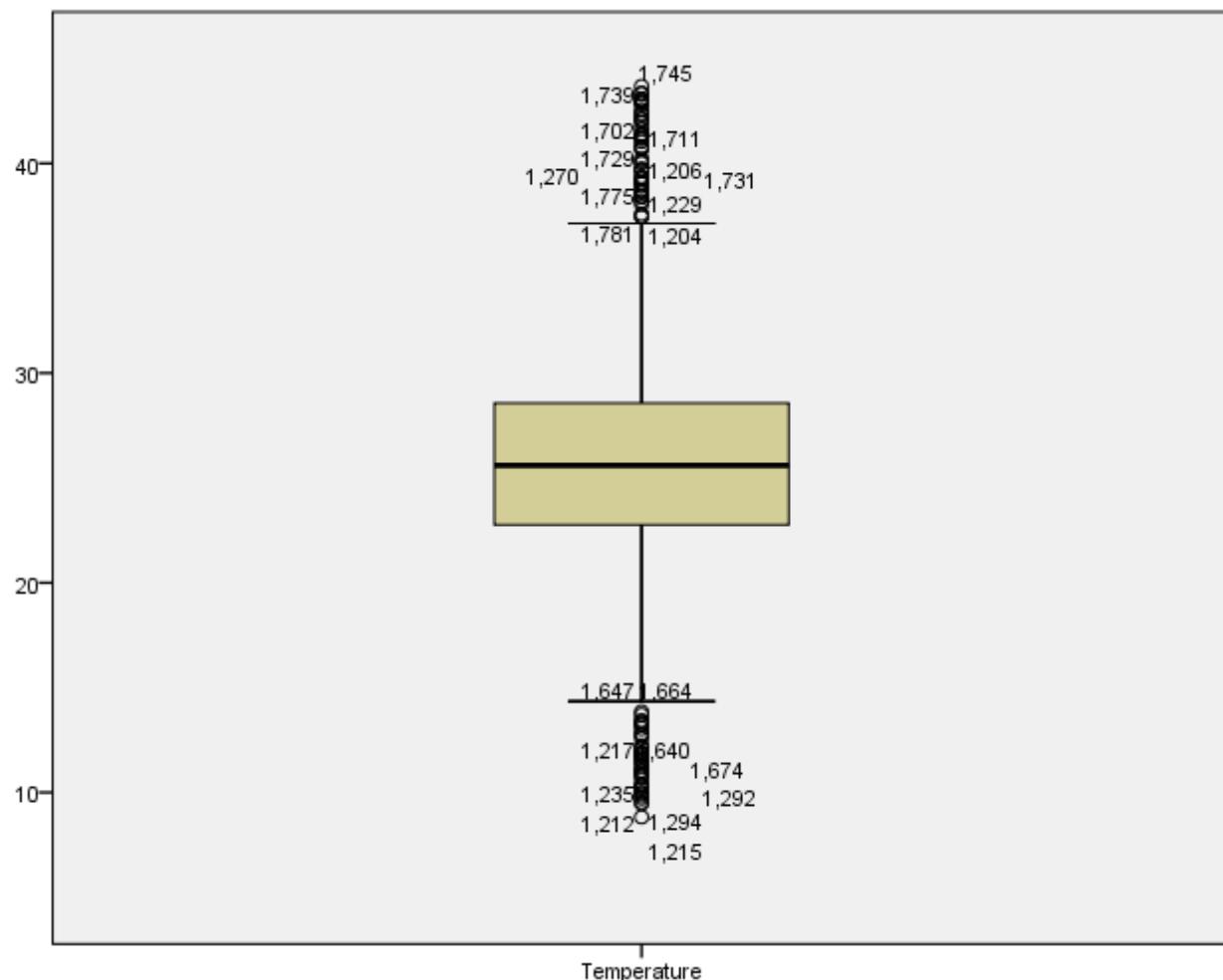
**Temperature Stem-and-Leaf Plot  
Frequency Stem & Leaf**

**38.00 Extremes ( $\leq 13.8$ )**

3.00	14 . &
12.00	15 . 347&
14.00	16 . 02357&
47.00	17 . 0011233444556889
87.00	18 . 000112223334445566777888999
90.00	19 . 0011122233334444555666677888999
82.00	20 . 000111122234455566677888999
83.00	21 . 00011112233344455566777888999
127.00	22 . 000111122333344444455666667777788899999
192.00	23 .
<b>000000011111122222333334444445555566666667777788888888999999</b>	
190.00	24 .
<b>0001111222223333334444444555556666667777788888888899999999</b>	
218.00	25 .
<b>0000000111111112222223333334444444555555666666677777788888999999</b>	
999	
178.00	26 .
<b>000001111122222222333334444444555555666677777888889999999</b>	
195.00	27 .
<b>000000001111112223333333444455555556666667777778888899999999</b>	
175.00	28 .
<b>000000001111122222333344445555556666666777778888899999999</b>	

**171.00    29 .**  
**0000000111111222223333334444555556666677788888899999**  
**54.00    30 . 00012334455578999&**  
**63.00    31 . 000122233444556778889**  
**33.00    32 . 1233456788&**  
**35.00    33 . 0123344567889**  
**30.00    34 . 0123556789**  
**22.00    35 . 2334689&**  
**11.00    36 . 0357&**  
**2.00    37 . &**  
**48.00 Extremes (≥37.5)**

**Stem width: 1.00**  
**Each leaf: 3 case(s)**  
**& denotes fractional leaves.**



**(Without Outlier)**

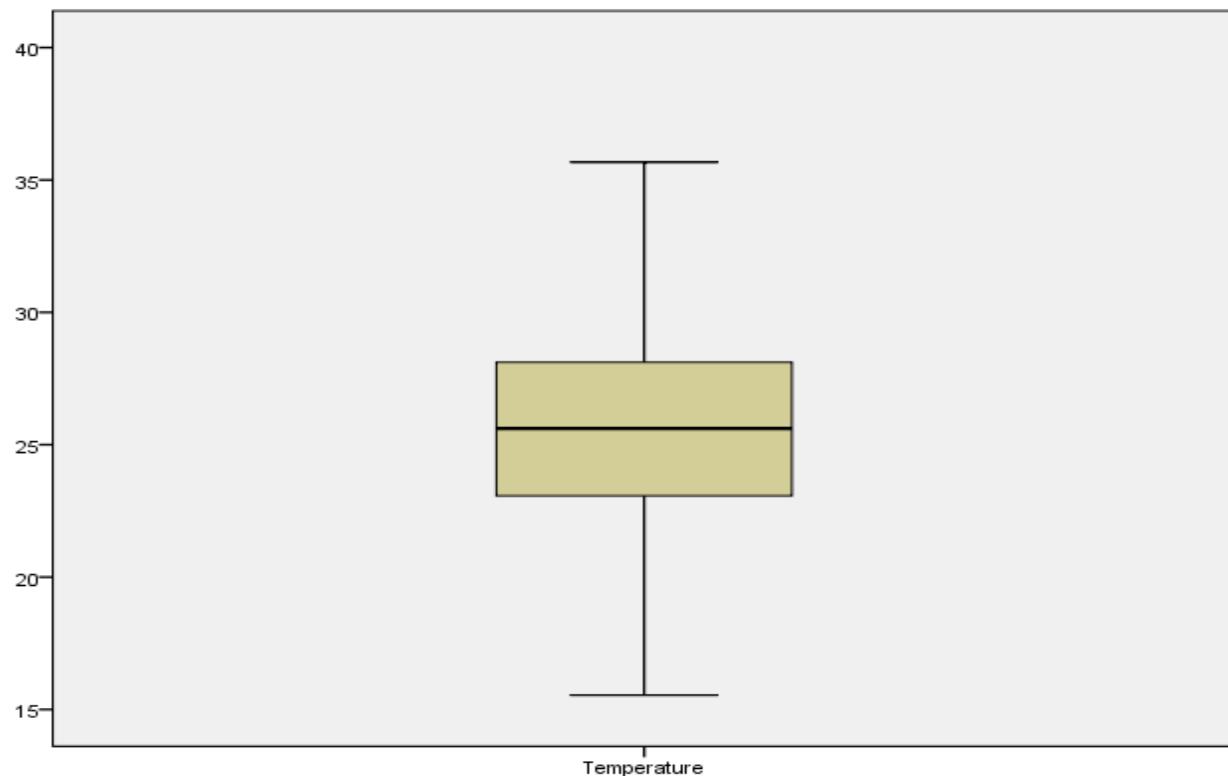
**Temperature Stem-and-Leaf Plot**  
**Frequency   Stem & Leaf**

7.00 15 . 7&  
 14.00 16 . 7&&  
 47.00 17 . 0123445689  
 87.00 18 . 00112233445567788899  
 90.00 19 . 00112233344455666778899  
 82.00 20 . 0011122344556678899  
 83.00 21 . 0011123344556778899  
 127.00 22 . 001112233344444556666777889999  
 192.00 23 . 0000011112223333444445555666666777888888999  
 190.00 24 . 00111122223333344444555566667778888888999999  
 332.00 25 .  
**00000111111222233334444455555666666666666666666666666666677**  
**777778889999**  
 178.00 26 . 000011112222223334444455555667778888999  
 195.00 27 . 0000011112233333444555555666677778888999999  
 175.00 28 . 00000111222223334445555566666677788899999  
 171.00 29 . 00000111112222333334445555566667778888999  
 54.00 30 . 0012334557899&  
 63.00 31 . 00122344567789  
 33.00 32 . 23456788&  
 35.00 33 . 1334578&&  
 30.00 34 . 0156789&  
 15.00 35 . 3&&

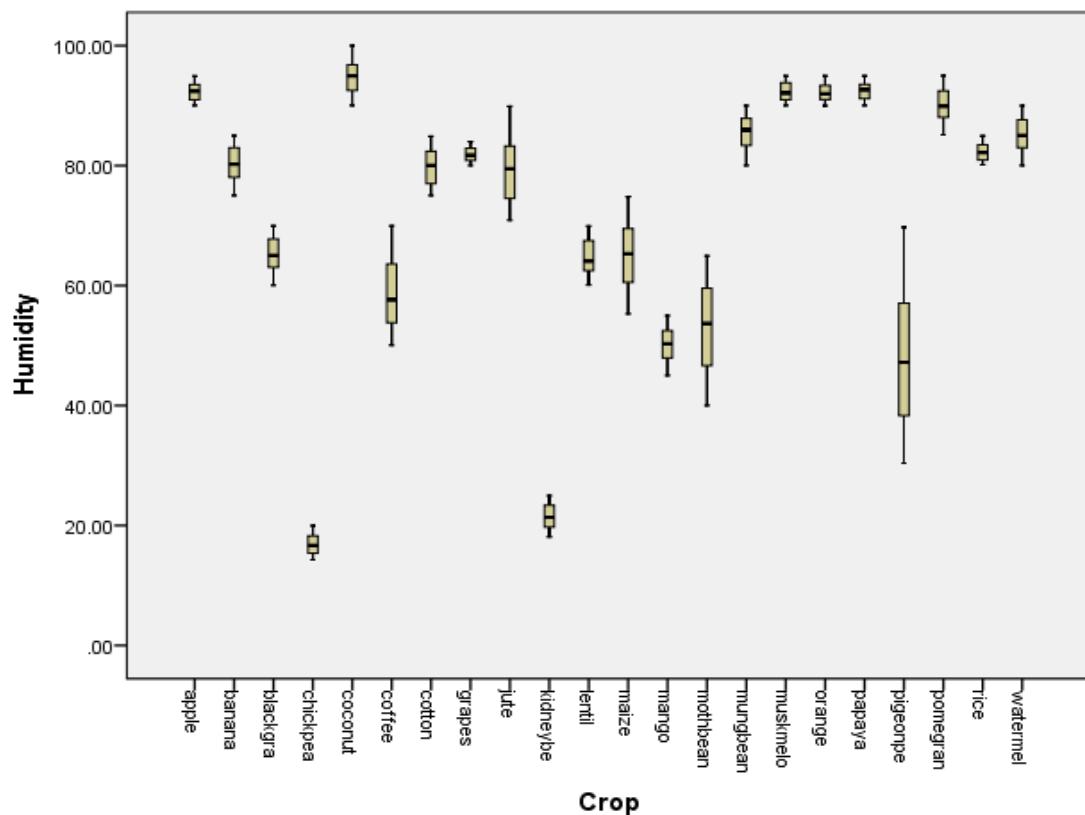
Stem width: 1.00

Each leaf: 4 case(s)

& denotes fractional leaves.



## Humidity:



### (With Outlier)

#### Humidity Stem-and-Leaf Plot

Frequency Stem & Leaf

30.00 Extremes (<16)

98.00 1 . 566677888889999

72.00 2 . 00112233444

.00 2 .

13.00 3 . 4&

17.00 3 . 58&

28.00 4 . 0134&

86.00 4 . 55566777888999

109.00 5 . 00011122222333444

87.00 5 . 5556667777888999

184.00 6 . 0000011111122222233333334444

152.00 6 . 55556666677778888889999

53.00 7 . 011223344

121.00 7 . 555666667777888889999

420.00 8 .

00000000000000000111111111111222222222223333333333344444444

4

183.00 8 . 5555666667777788889999999

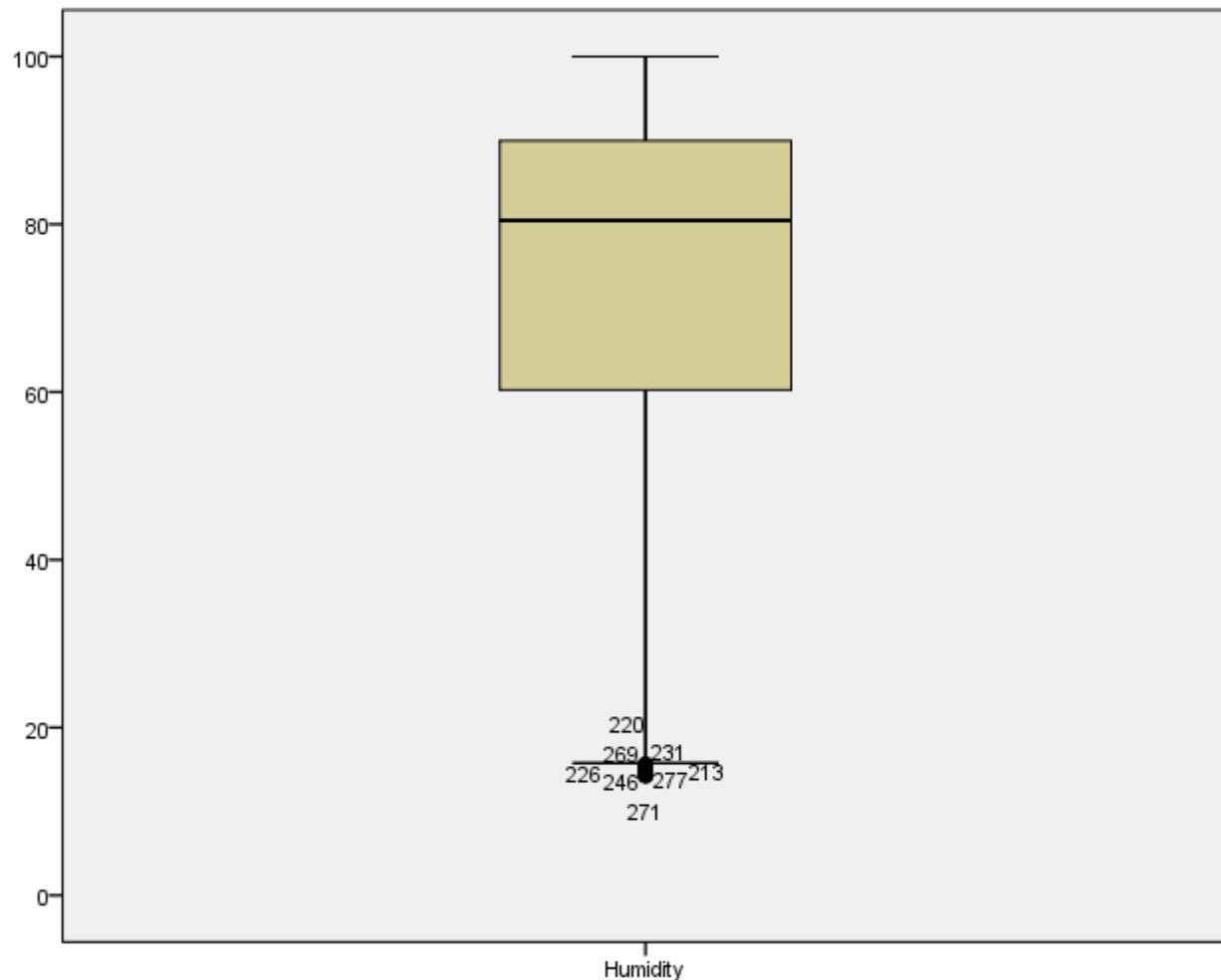
497.00 9 .

0000000000000000011111111111122222222223333333333344

444444444444

**50.00      9 . 55566789**

**Stem width: 10.00**  
**Each leaf: 6 case(s)**  
**& denotes fractional leaves.**



**(Without Outlier)**

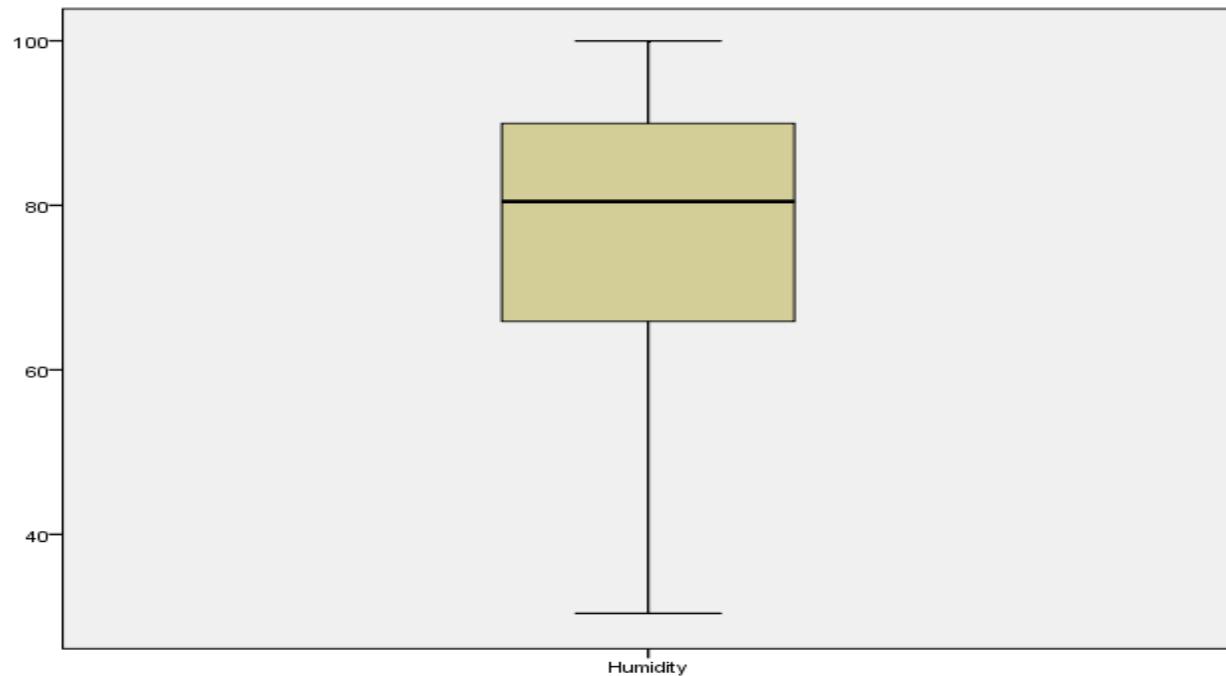
**Humidity Stem-and-Leaf Plot**

**Frequency   Stem & Leaf**

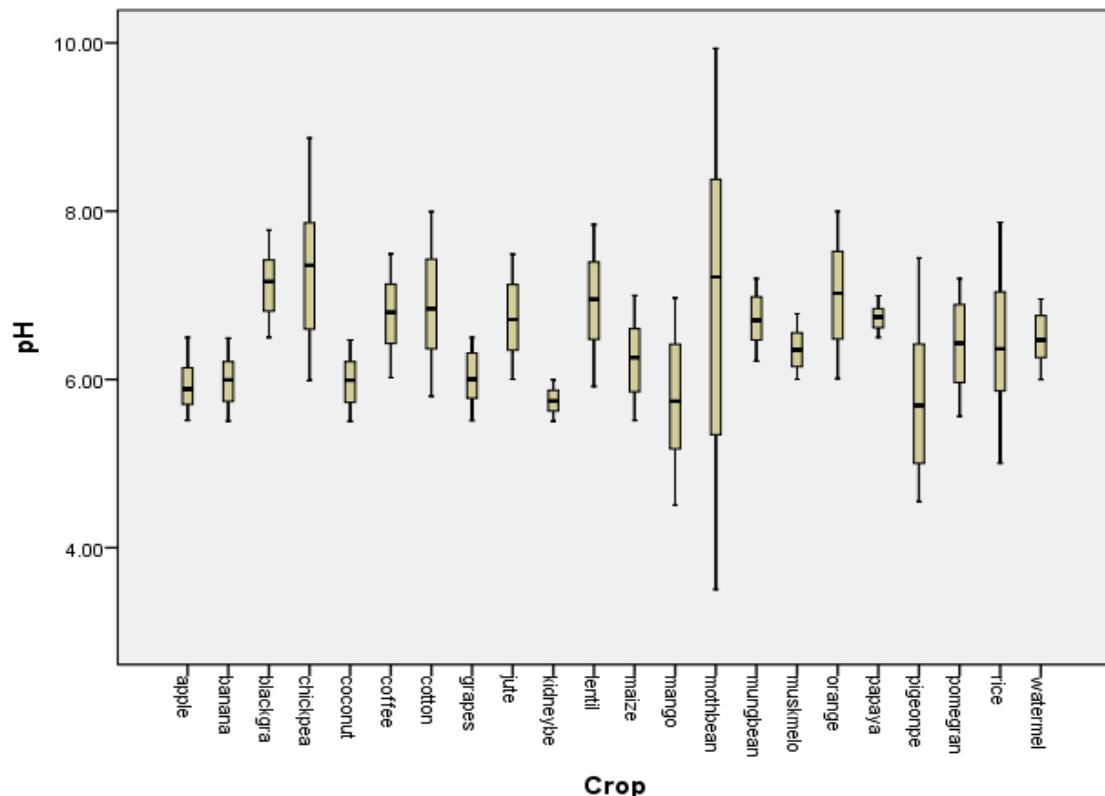
<b>13.00</b>	<b>3 . 4&amp;</b>
<b>17.00</b>	<b>3 . 58&amp;</b>
<b>28.00</b>	<b>4 . 0134&amp;</b>
<b>86.00</b>	<b>4 . 5556677788999</b>
<b>109.00</b>	<b>5 . 0001122222333444</b>
<b>87.00</b>	<b>5 . 555666777788999</b>
<b>184.00</b>	<b>6 . 000001111112222223333334444</b>
<b>152.00</b>	<b>6 . 555556666677778888889999</b>
<b>253.00</b>	<b>7 . 01111111111111111111111111111111223344</b>
<b>121.00</b>	<b>7 . 55566666777788889999</b>

**420.00**    8 .  
**00000000000000011111111111122222222222333333333344444444**  
**4**  
**183.00**    8 . **5555566666677777888899999999**  
**497.00**    9 .  
**0000000000000000000111111111111122222222223333333333344**  
**444444444444**  
**50.00**    9 . **55566789**

**Stem width:**    10.00  
**Each leaf:**    6 case(s)  
**&** denotes fractional leaves.



**♂ pH:**



(With Outlier)

## pH Stem-and-Leaf Plot

### Frequency Stem & Leaf

**18.00 Extremes ( $\leq 4.5$ )**

**10.00 Extremes**

**4.00**      **4.3**

**15.00**

**13.00**      4 : 88999  
**23.00**      5 0000111

**23.00**      3 : 0000111  
**20.00**      5 222333

**20.00**      3. 222333  
**01.00**      5. 1111555

91.00 3 : 4444555  
184.00 5

**184.00**      **5.**

**103.00**      **5**

**193.00**      **5.**

**837.00**

**237.00**      6.

**1111111111**

258 26 6

**252.00**      **6.**

22222222222222222222  
22222222222222222222

**3333333333333333**  
**674.66**      **6**

**254.00**      **6.**

**5555555555555555**

**220.00**      **6.**

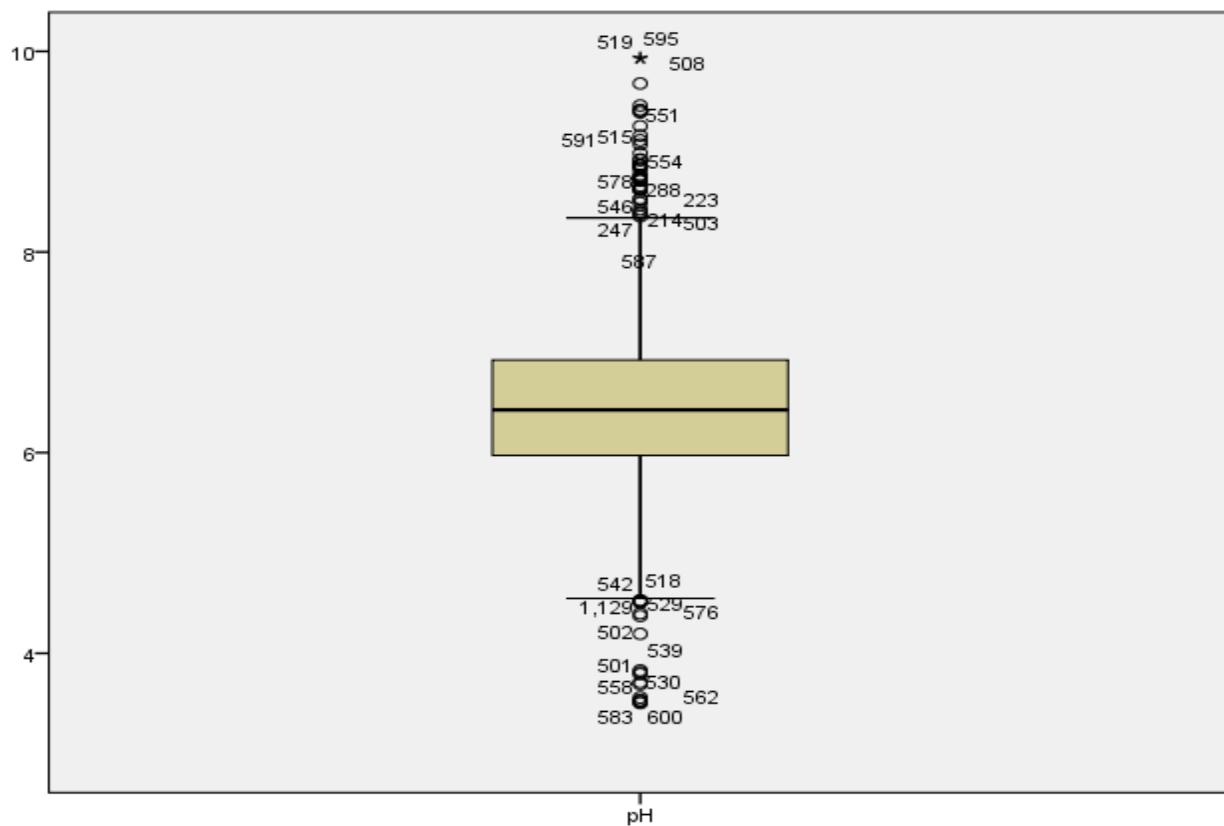
**666666666666666666**

77777

**Stem width:** 1.00

**Each leaf:**      **3 case(s)**

**& denotes fractional leaves.**



### **(Without Outlier)**

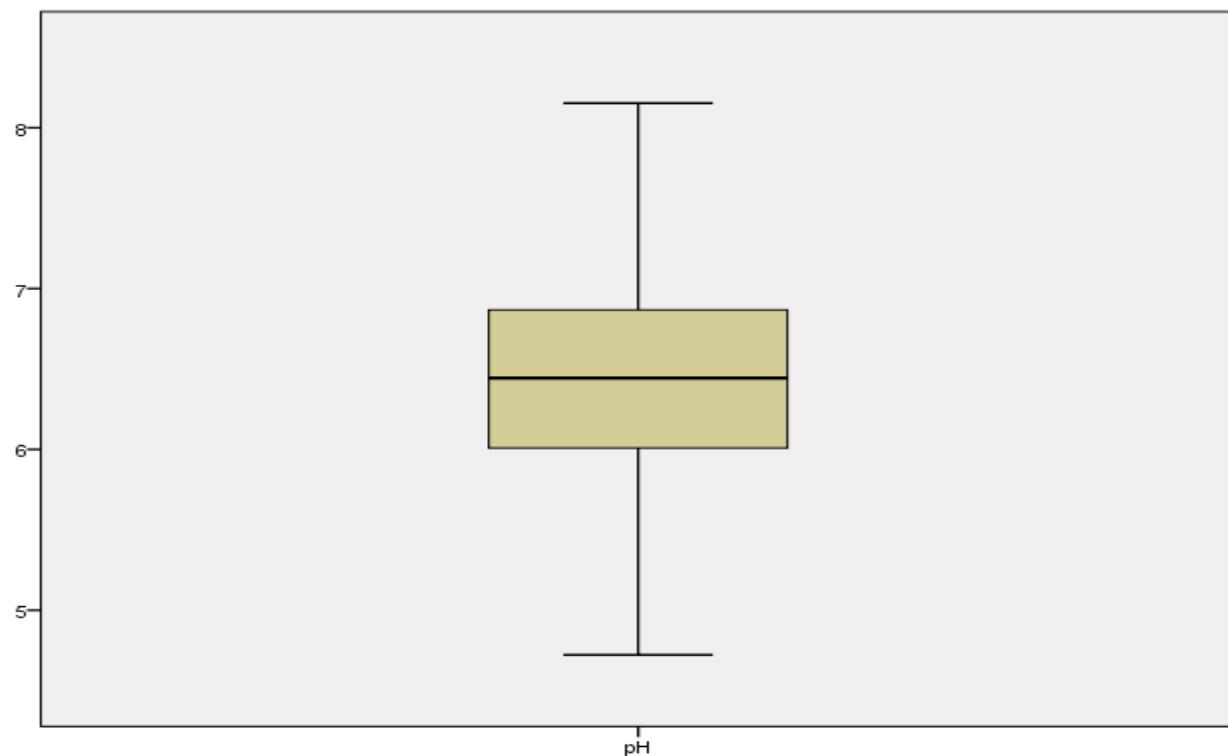
## pH Stem-and-Leaf Plot

**Frequency Stem & Leaf**

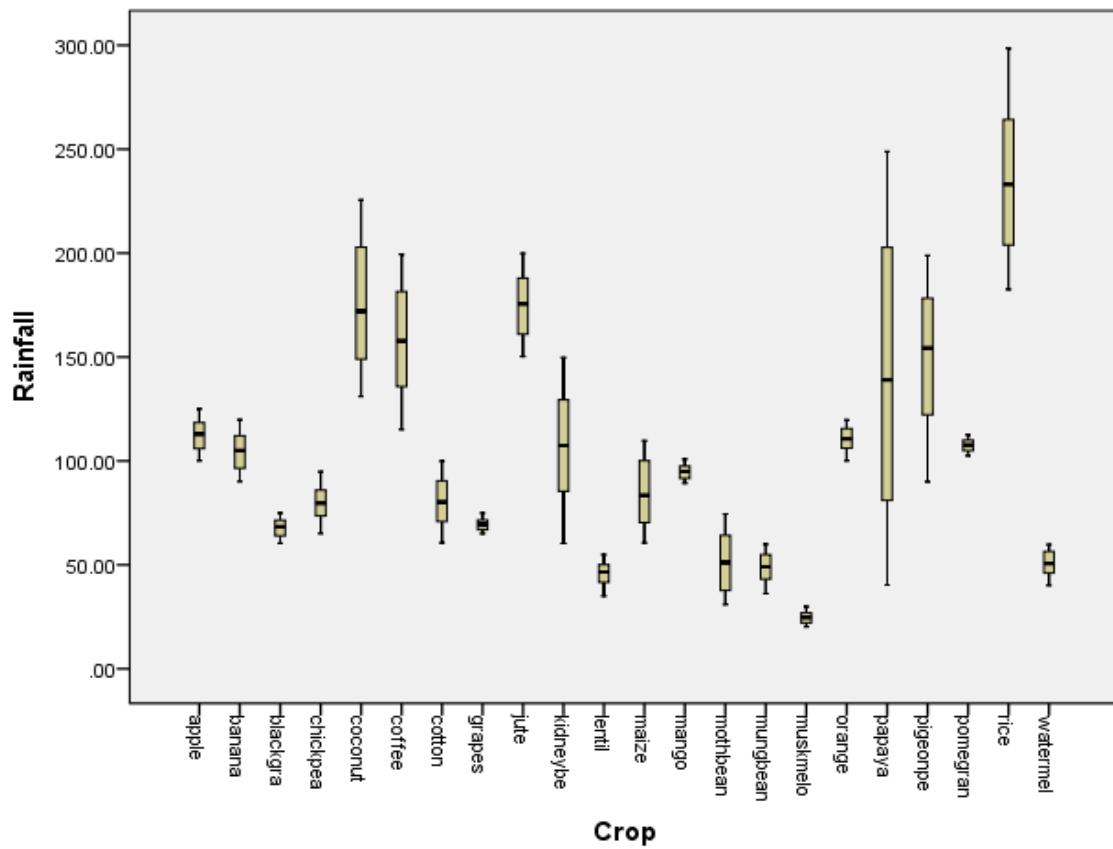
184.00 5 . 6666666666666666666666666666777777777777777777777  
 193.00 5 . 8888888888888888888888888888999999999999999999999999999  
 237.00 6 .  
**000000000000000000000000000000000111111111111111111111111111111111**  
 252.00 6 .  
**22222222222222222222222222222333333333333333333333333333333333333333**  
 337.00 6 .  
**4455555555555555**  
**555555555555555**  
 220.00 6 . 6666666666666666666666666666777777777777777777777777777777  
 196.00 6 . 8888888888888888888888889999999999999999999999999999999999  
 136.00 7 . 00000000000000000001111111111111111111111  
 100.00 7 . 222222222223333333333333  
 83.00 7 . 44444444444555555555  
 53.00 7 . 6666667777777  
 40.00 7 . 8888889999  
 9.00 8 . 01

**Stem width:** 1.00

**Each leaf:** 4 case(s)



**↙ Rainfall:**



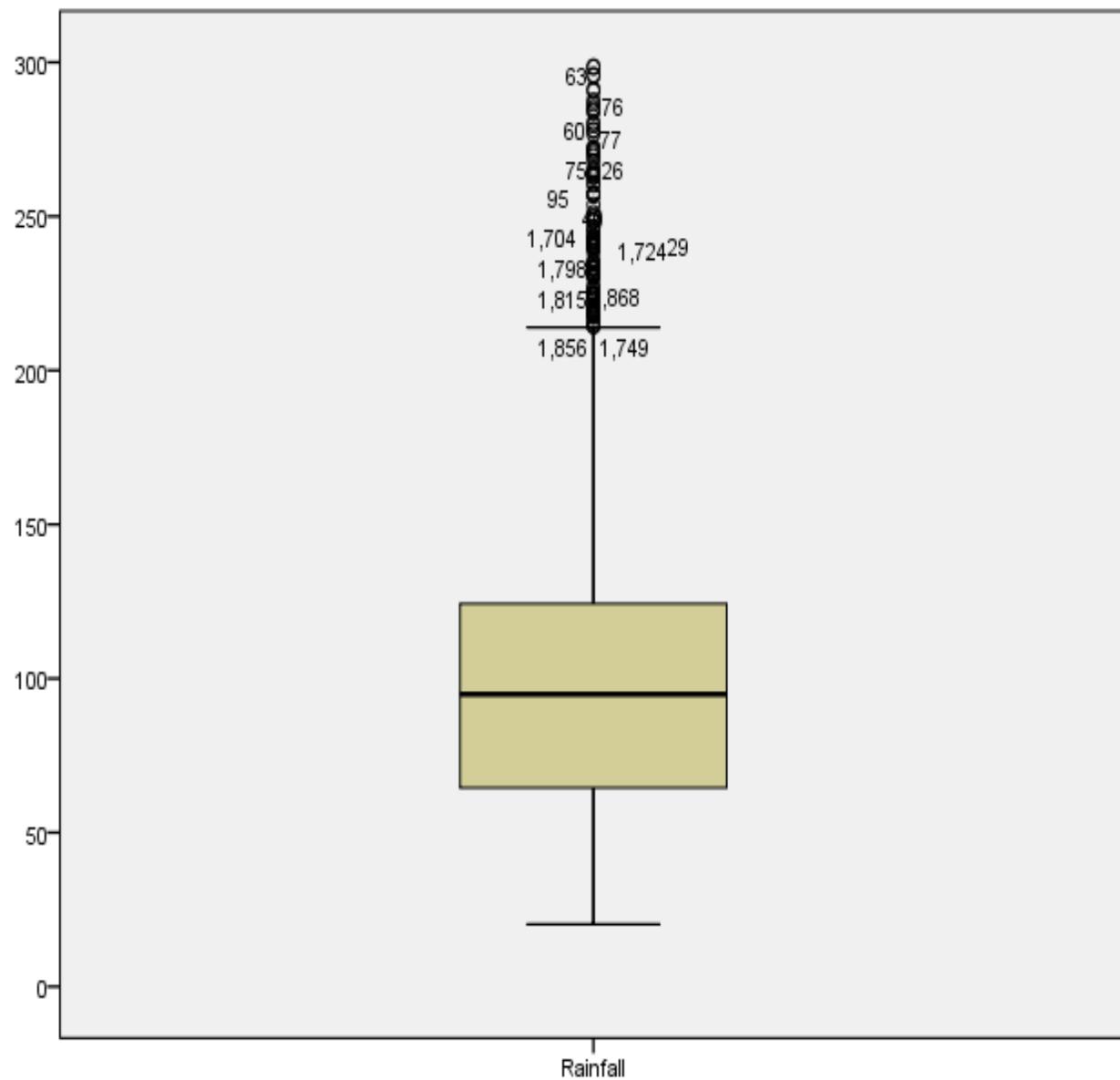
**(With Outlier)**

**Rainfall Stem-and-Leaf Plot**  
**Frequency    Stem & Leaf**

100.00	2 . 00011111222333444455566666777888899
63.00	3 . 12234555666667778889&
168.00	4 .
0000011111222233334444445556666667778888888999999	
146.00	5 . 0000011111222233333344444555666667777788889999
226.00	6 .
0001111222223333334444445555555566666666677777778888888999999	
999999	
185.00	7 .
00000000011111111122222333333344444444455566667788888999	
101.00	8 . 000111122334455667777888889999
198.00	9 .
000000000111111111222223333344444455555566666667777778888889999	
258.00	10 .
00000000011112222222333333444444444555555666666677777778888888	
888899999999999999	
169.00	11 .
0000000011111112222223333444455555666666677777888899999	
60.00	12 . 00011122223444566799&
47.00	13 . 012344556678999
54.00	14 . 0112334445567788999

**49.00**    **15 . 000123345667799&**  
**52.00**    **16 . 001122334556678899**  
**54.00**    **17 . 1112234455667789&**  
**61.00**    **18 . 00112223344556678899**  
**77.00**    **19 . 0011112222334455566777899**  
**26.00**    **20 . 023456899&**  
**7.00**      **21 . 013&**  
**99.00 Extremes** ( $\geq 214$ )

**Stem width:** **10.00**  
**Each leaf:** **3 case(s)**  
**& denotes fractional leaves.**



(Without Outlier)

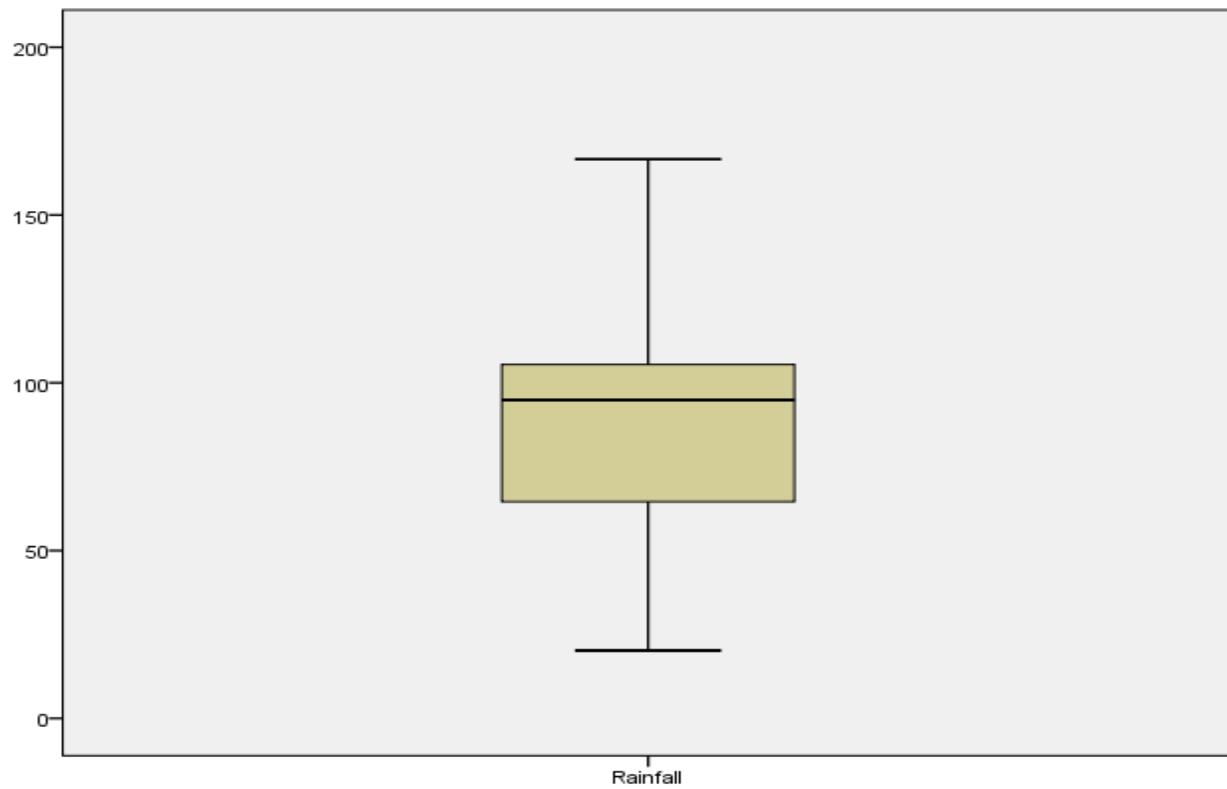
## Rainfall Stem-and-Leaf Plot

**Frequency Stem & Leaf**

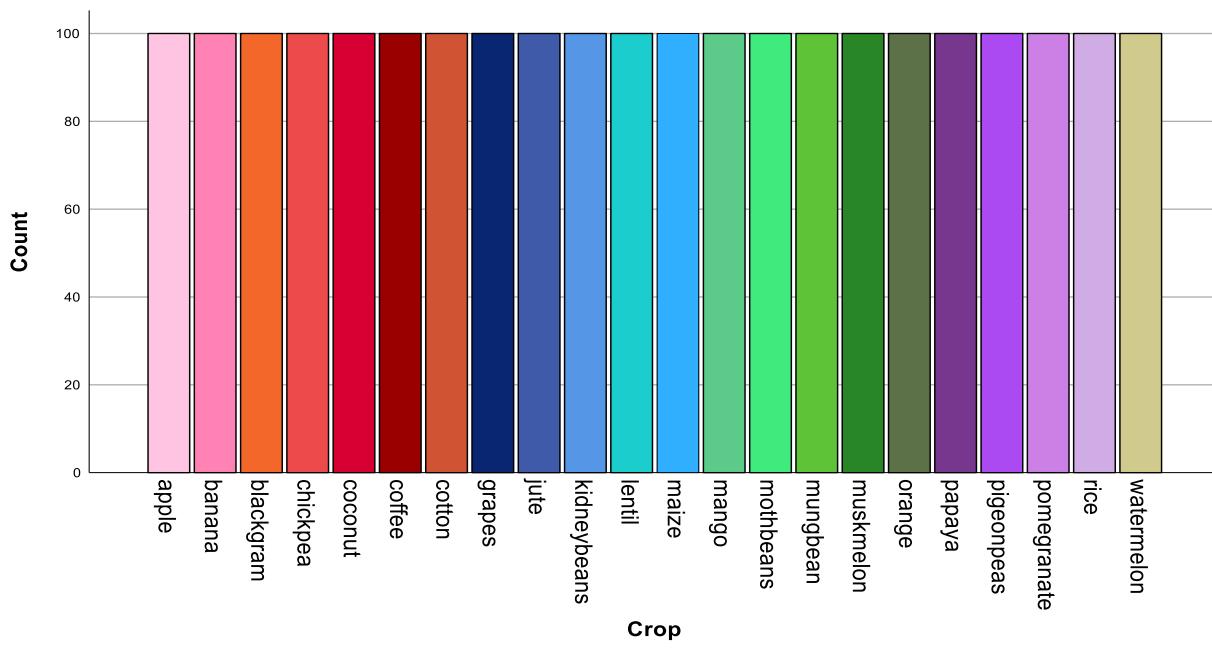
**Stem width:** 10.00

**Each leaf:** 5 case(s)

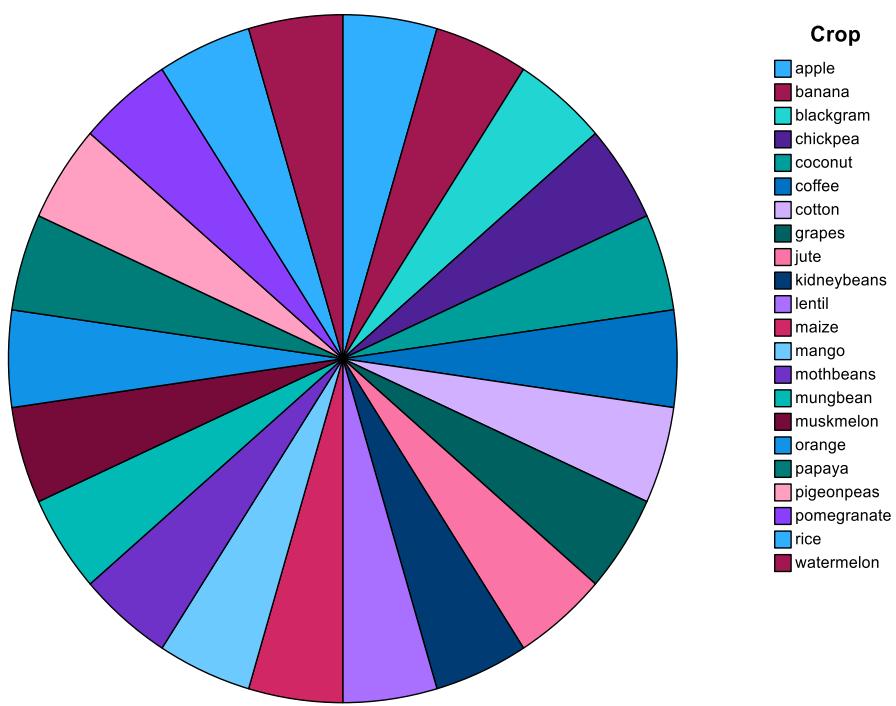
& denotes fractional leaves.



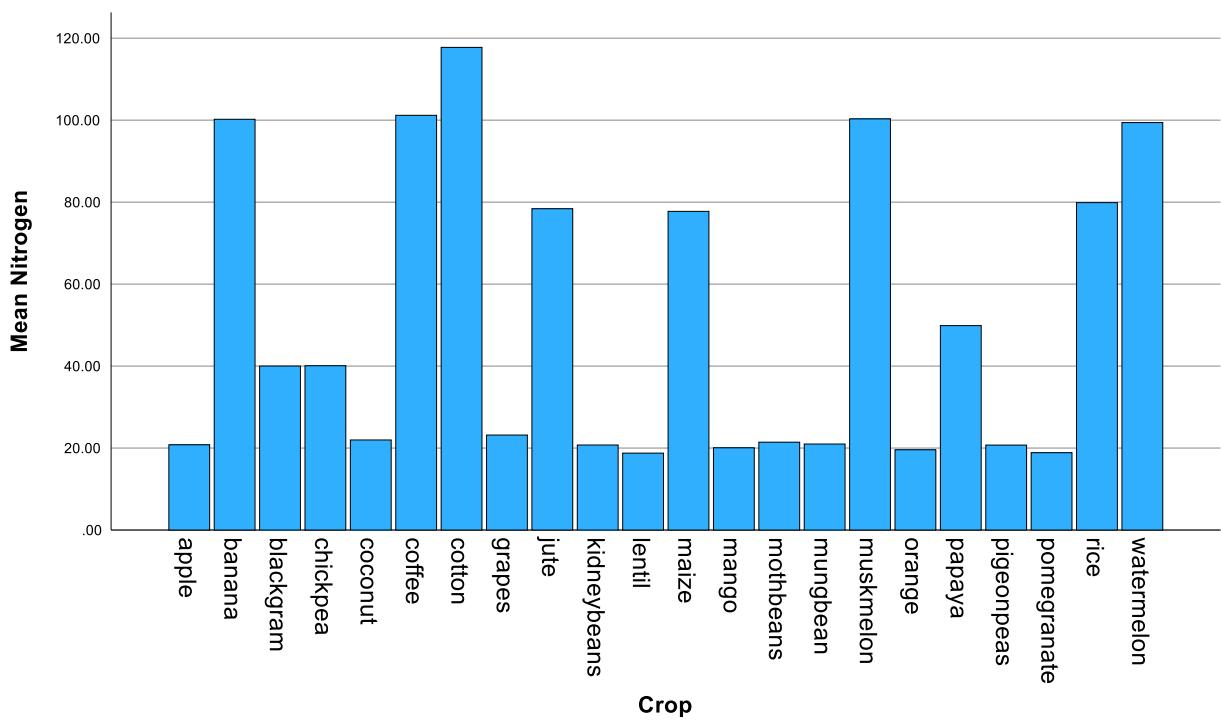
### Count: Bar Graph:

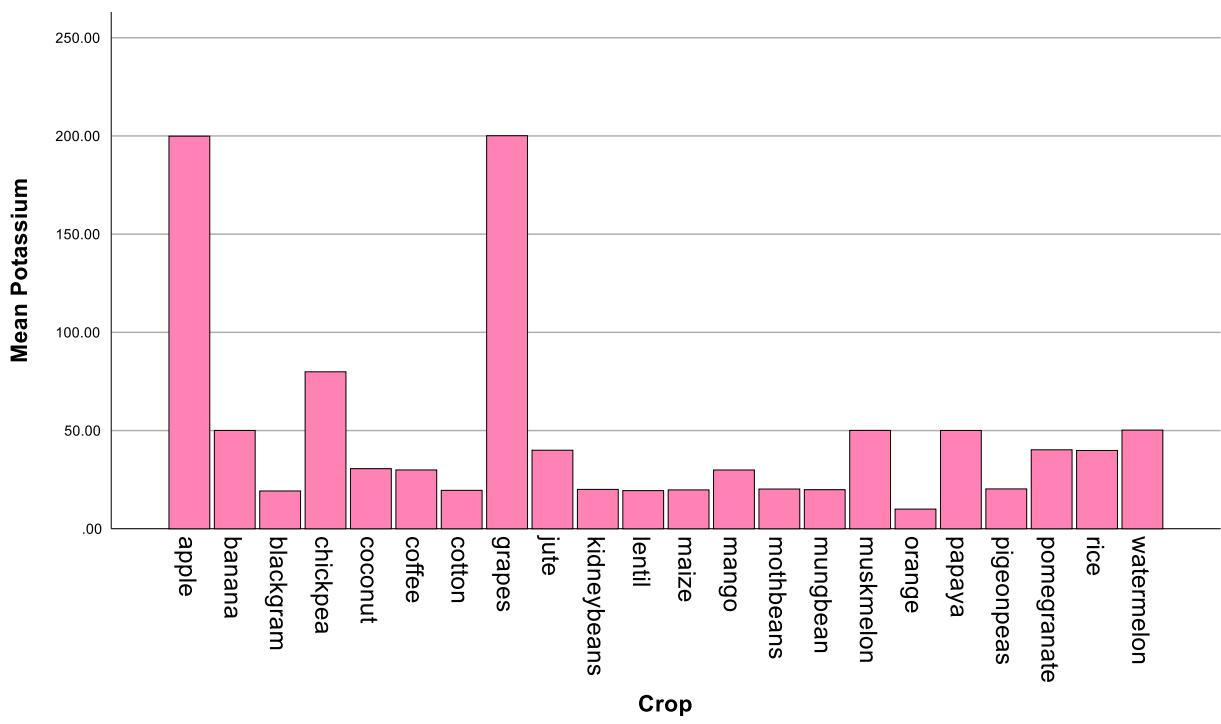
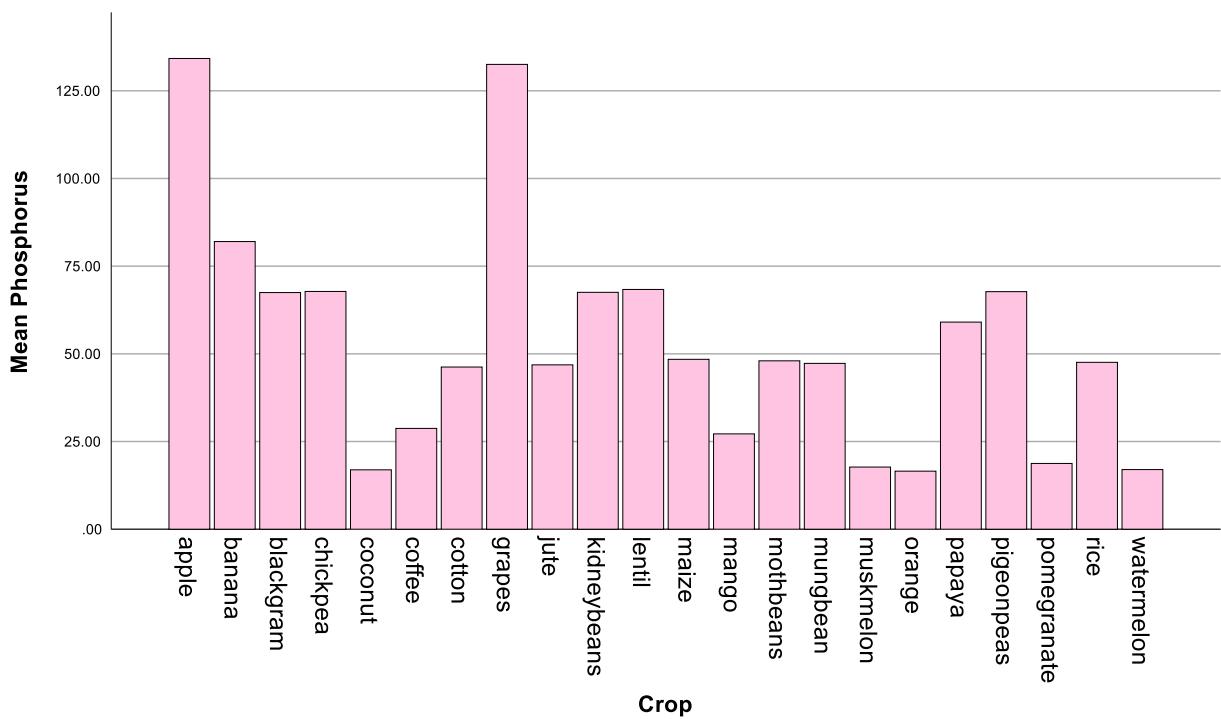


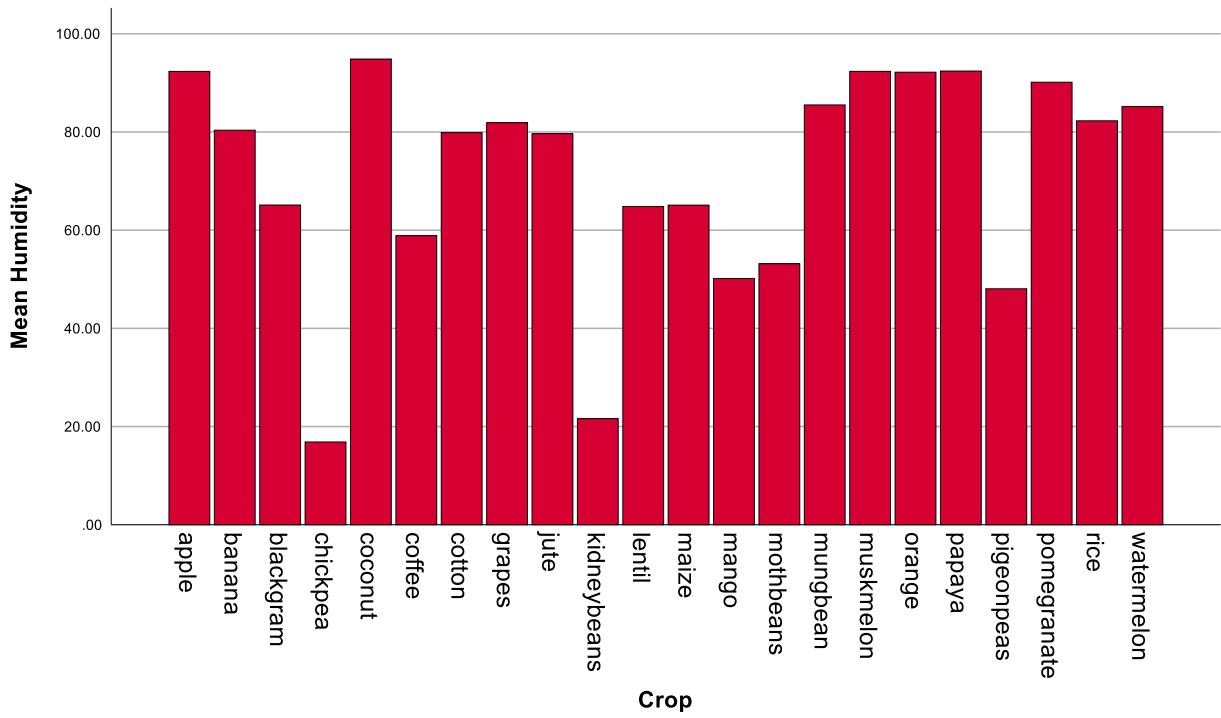
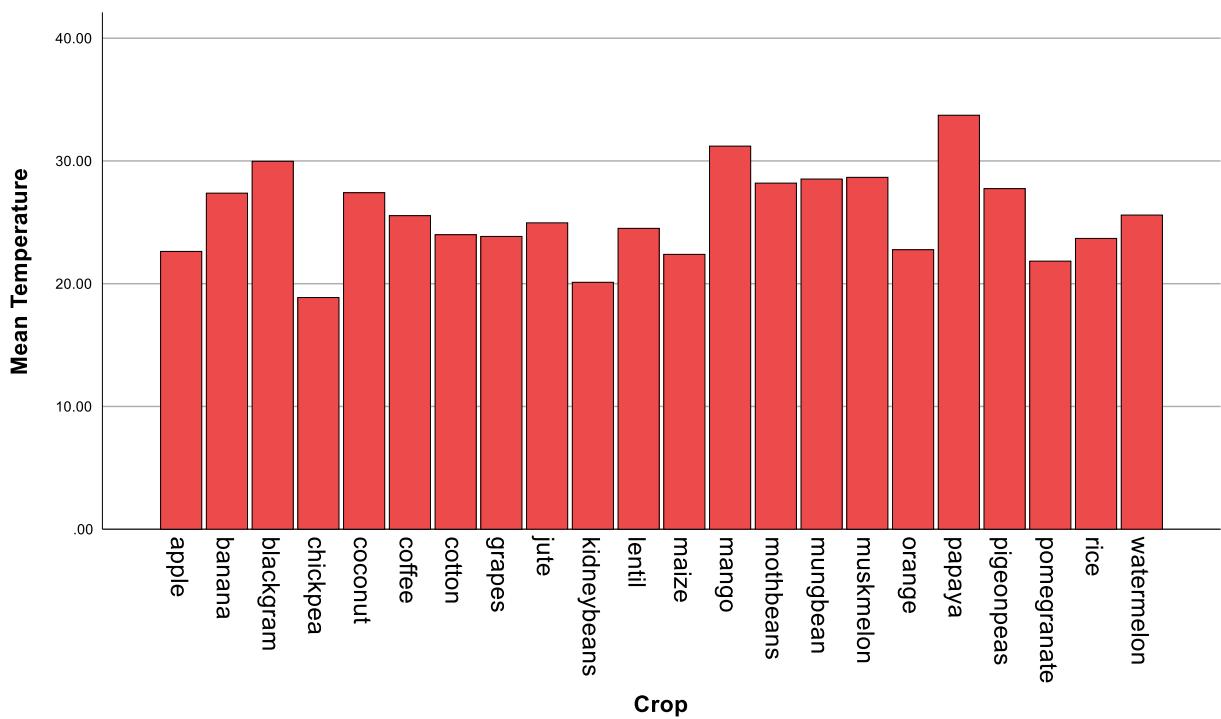
**Pie Chart:**

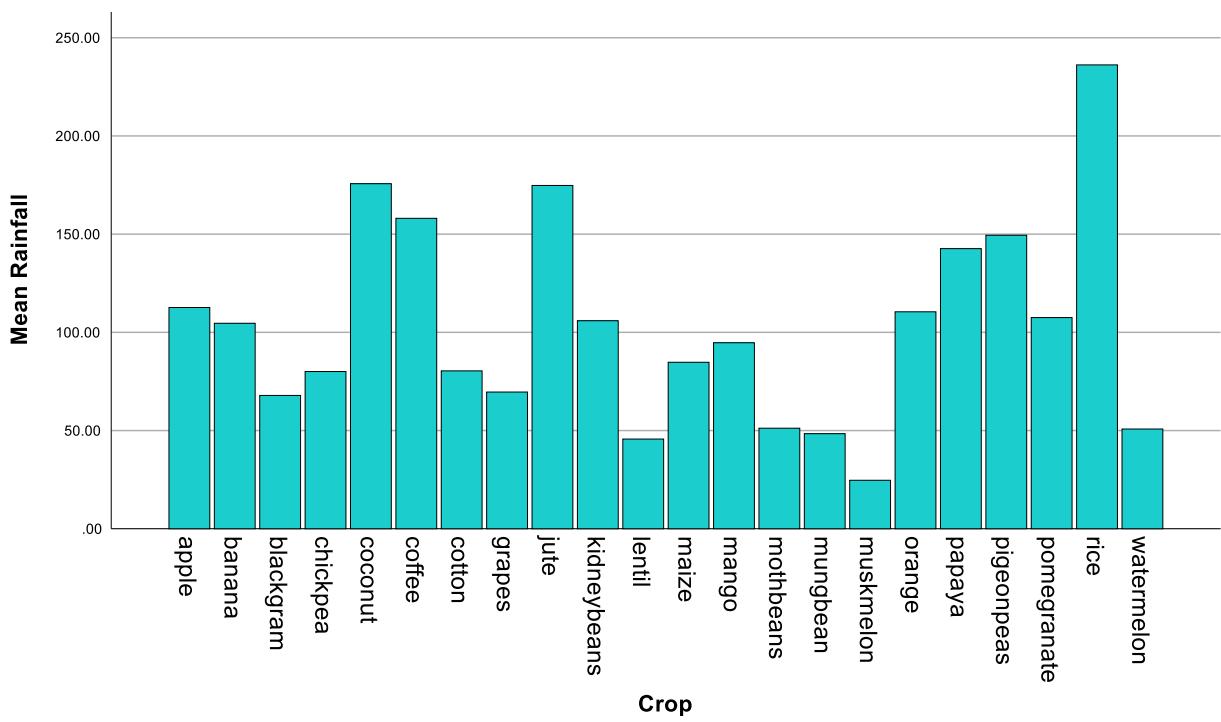
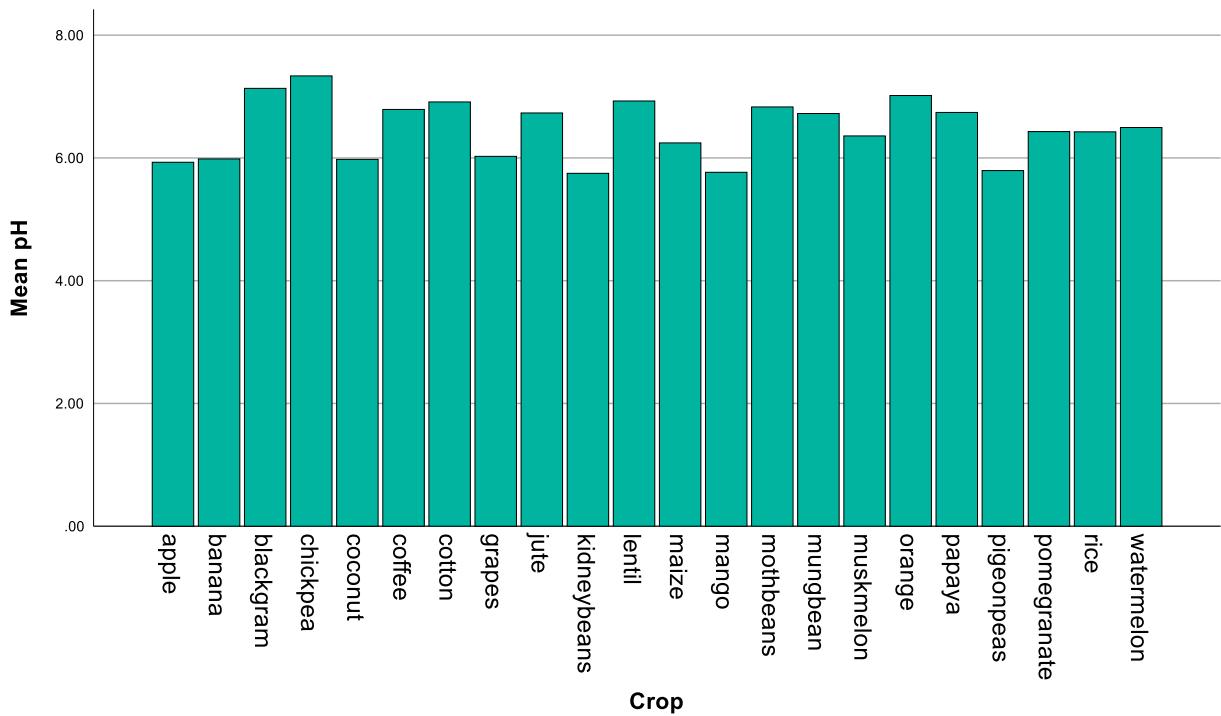


**Graph For Mean:  
Simple Bar Graph:**

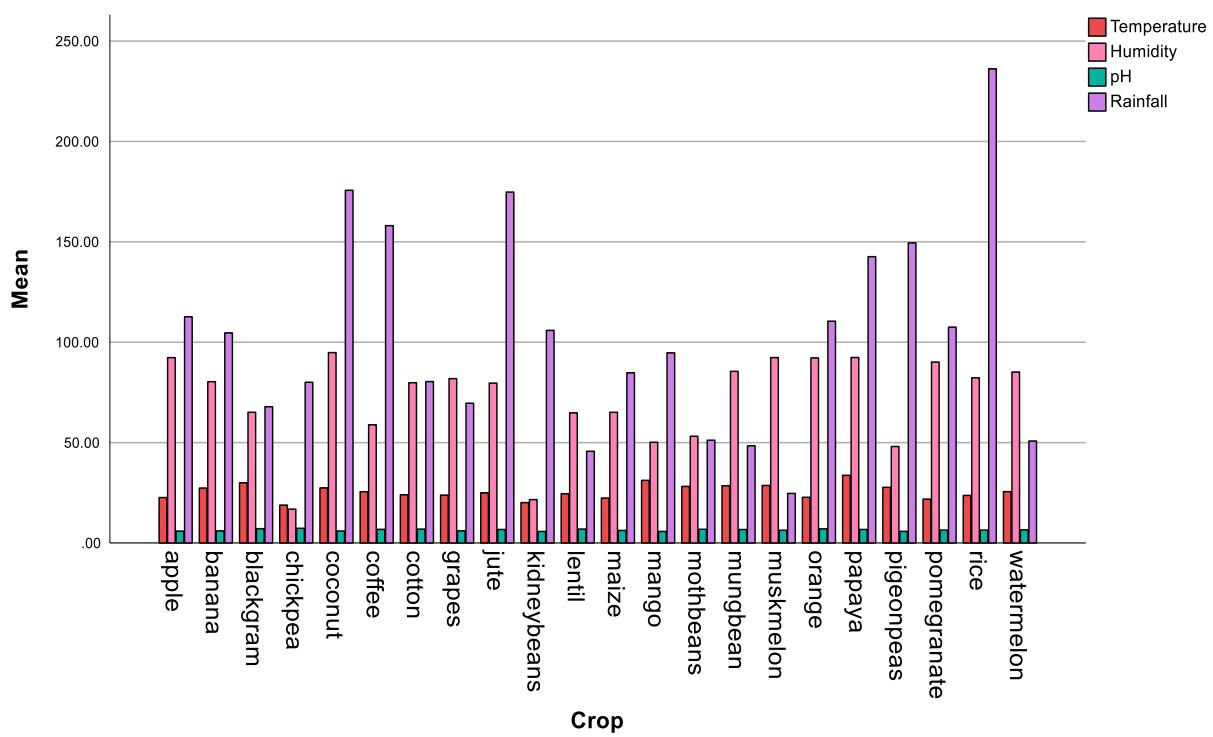
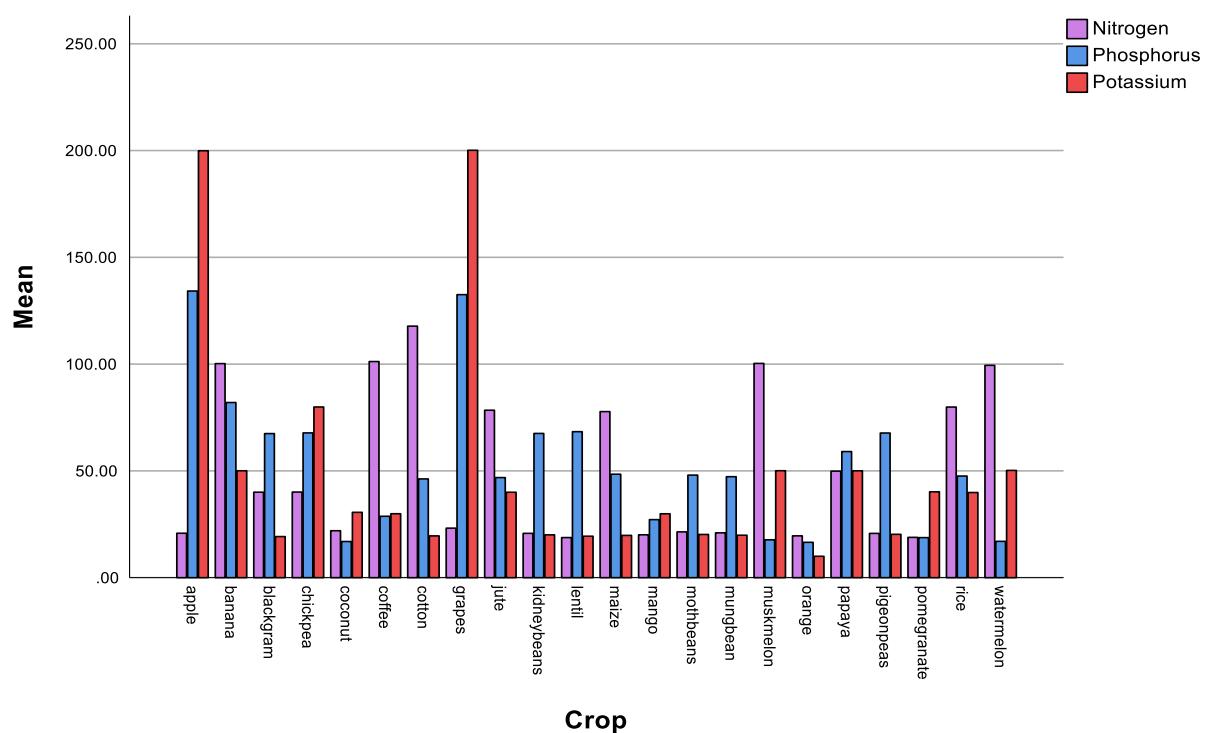




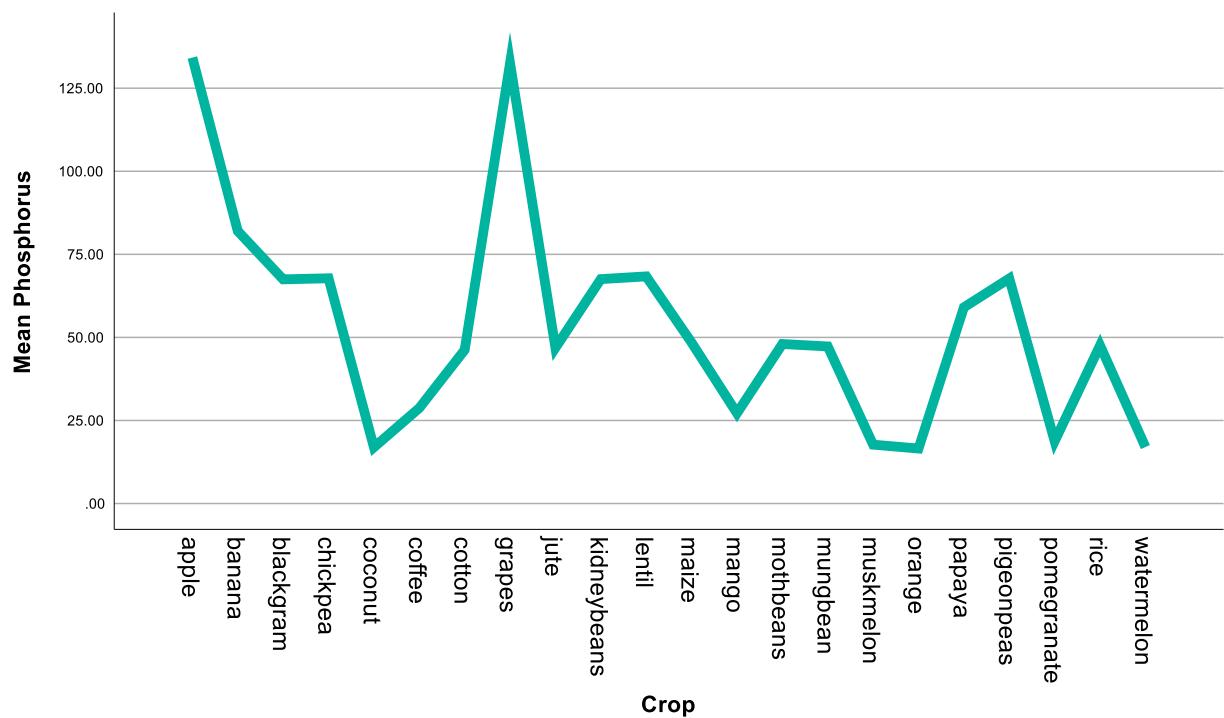
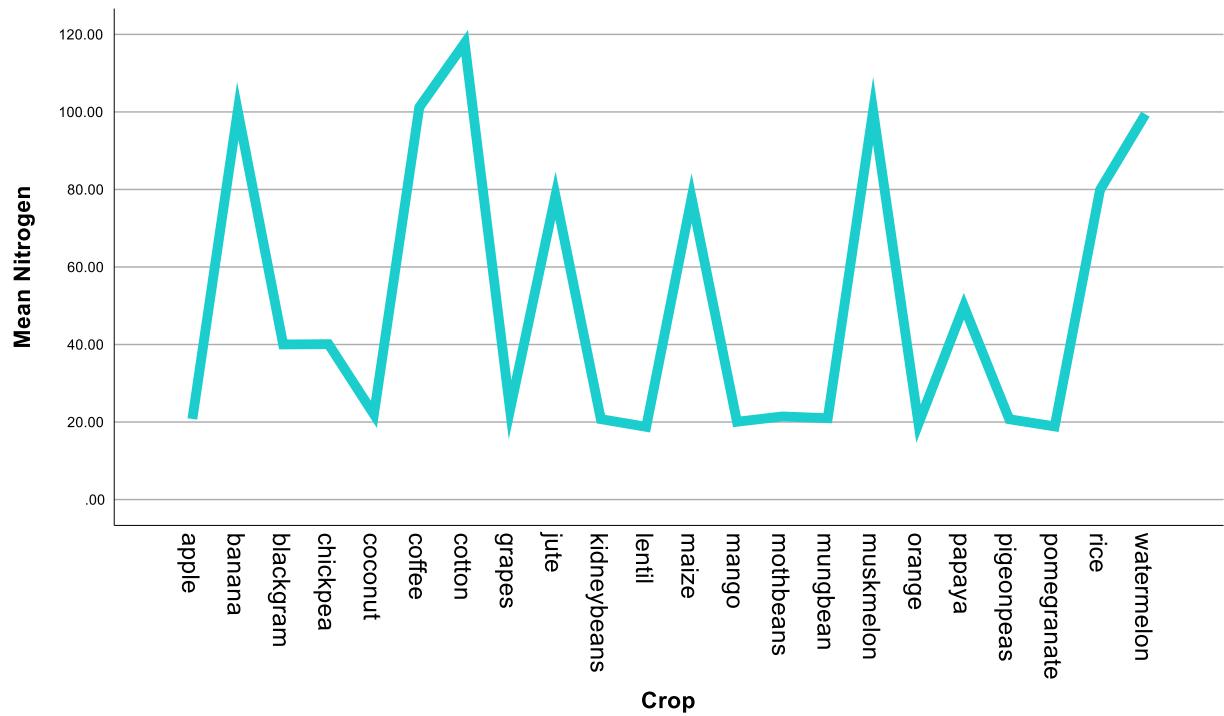


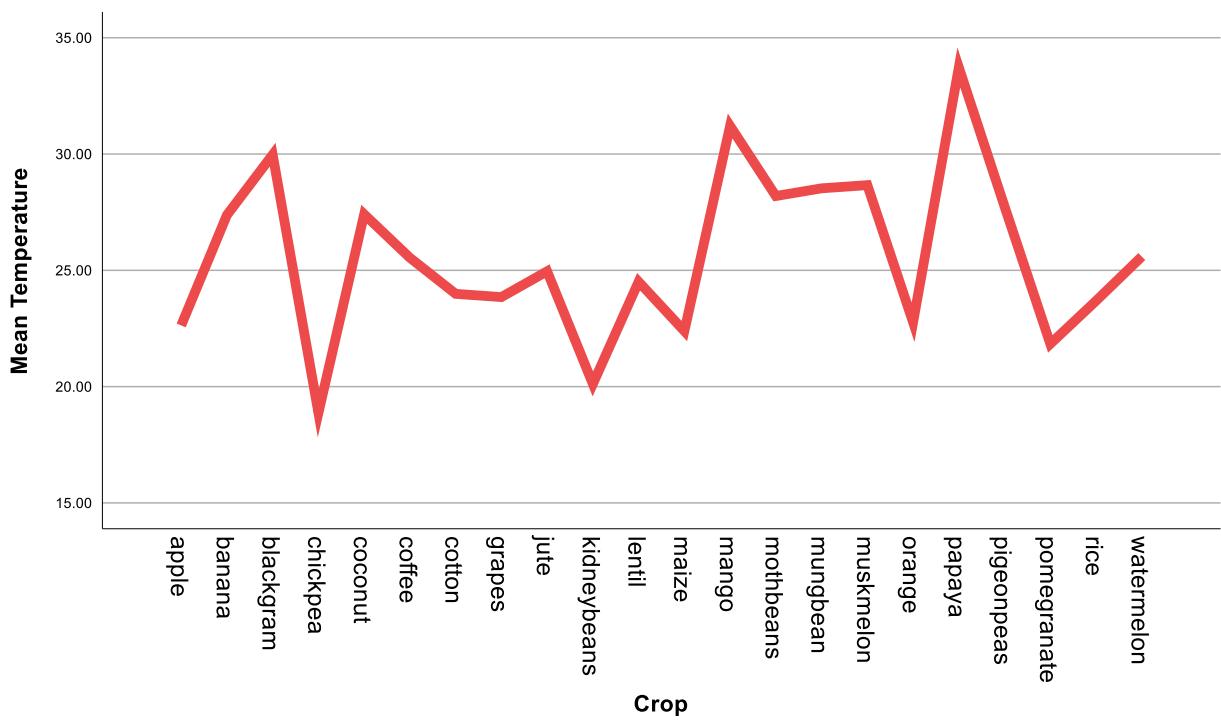
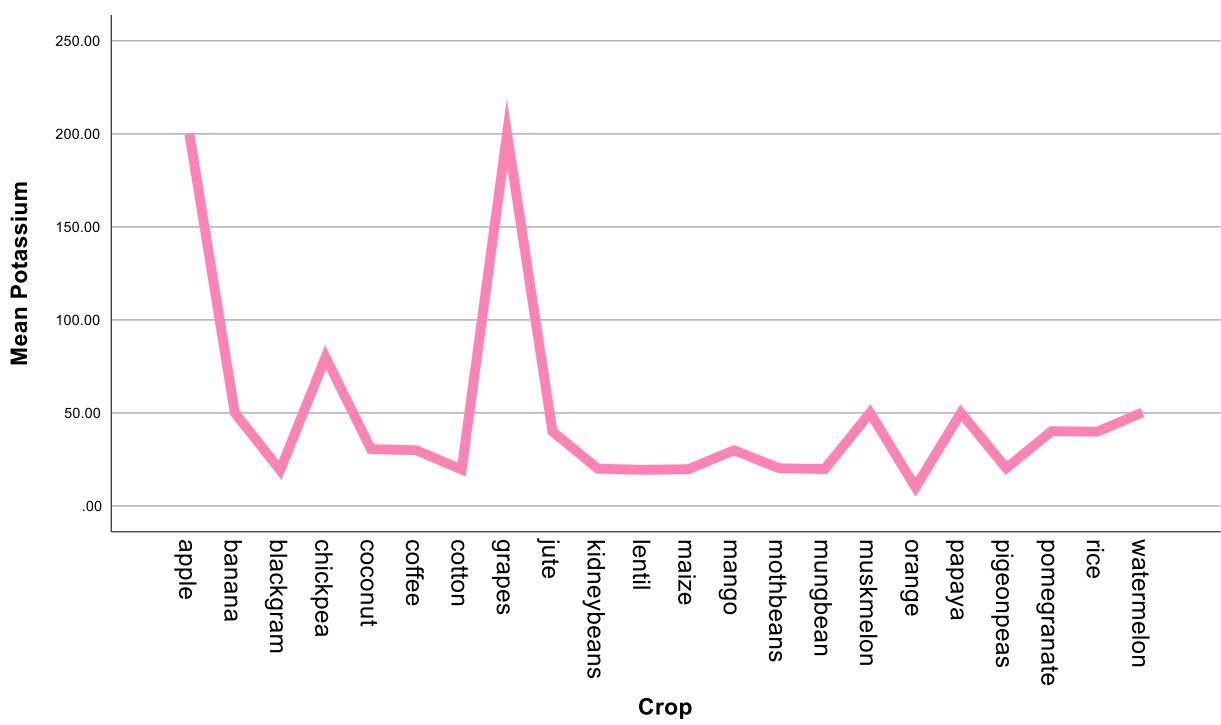


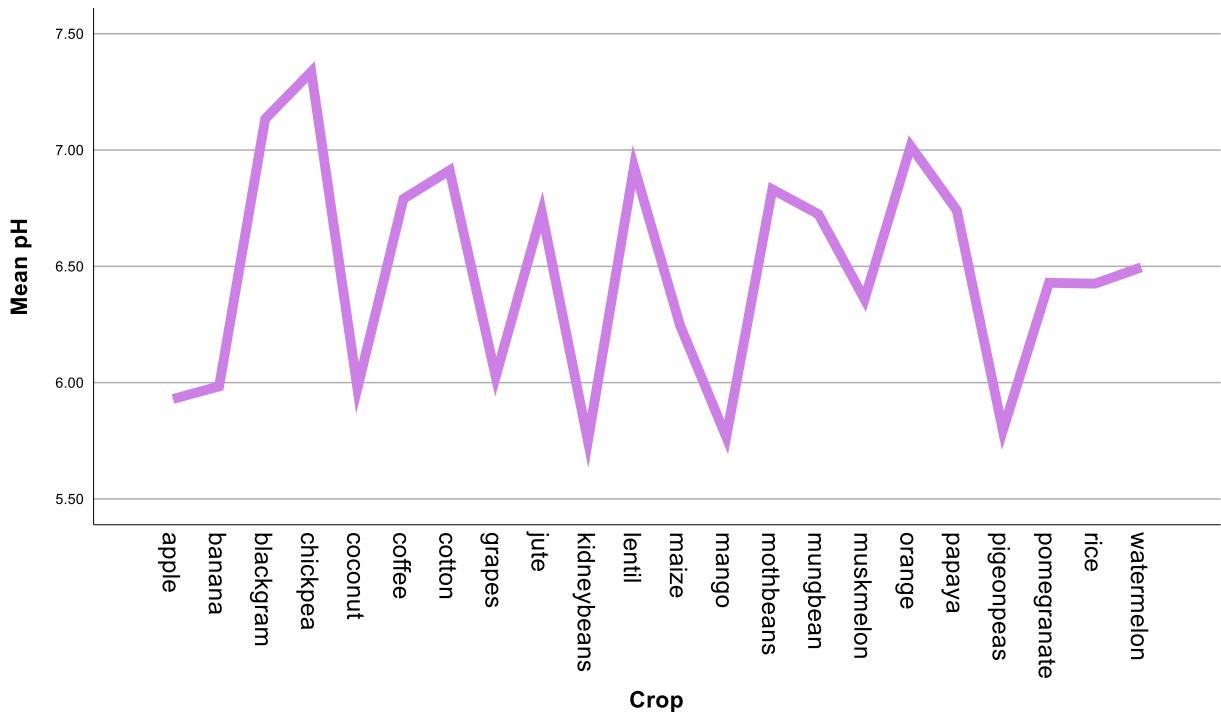
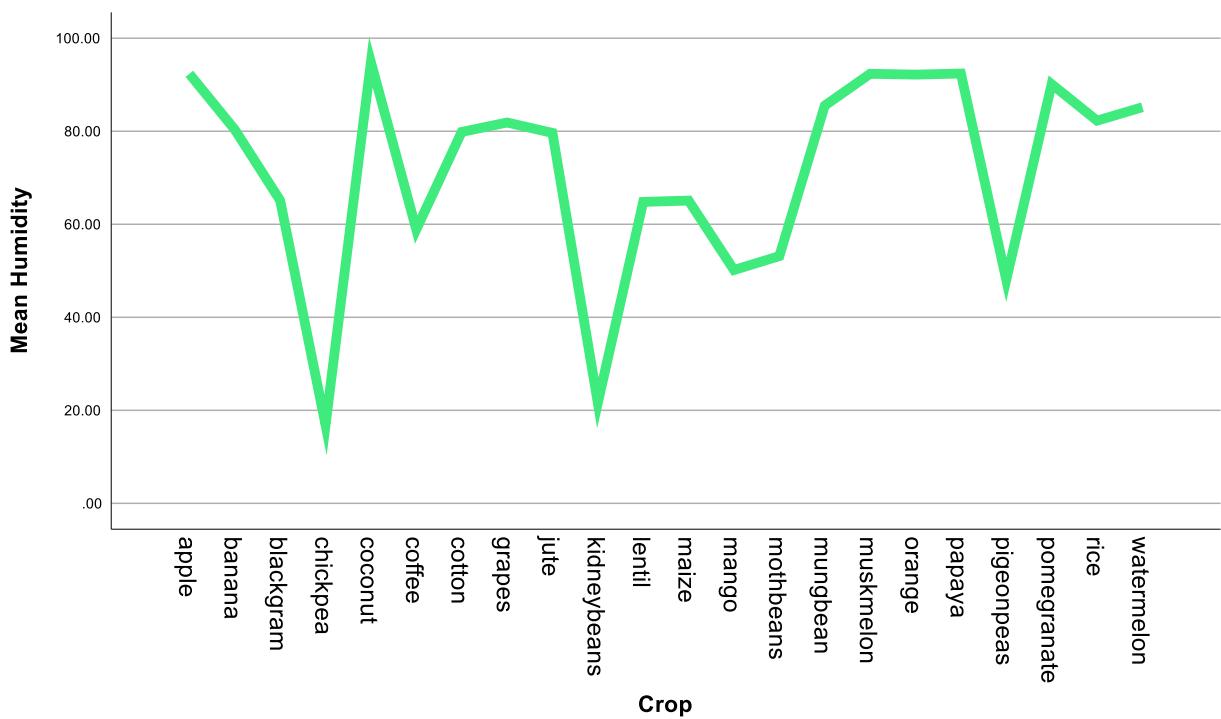
## **Clustered Bar Graph:**

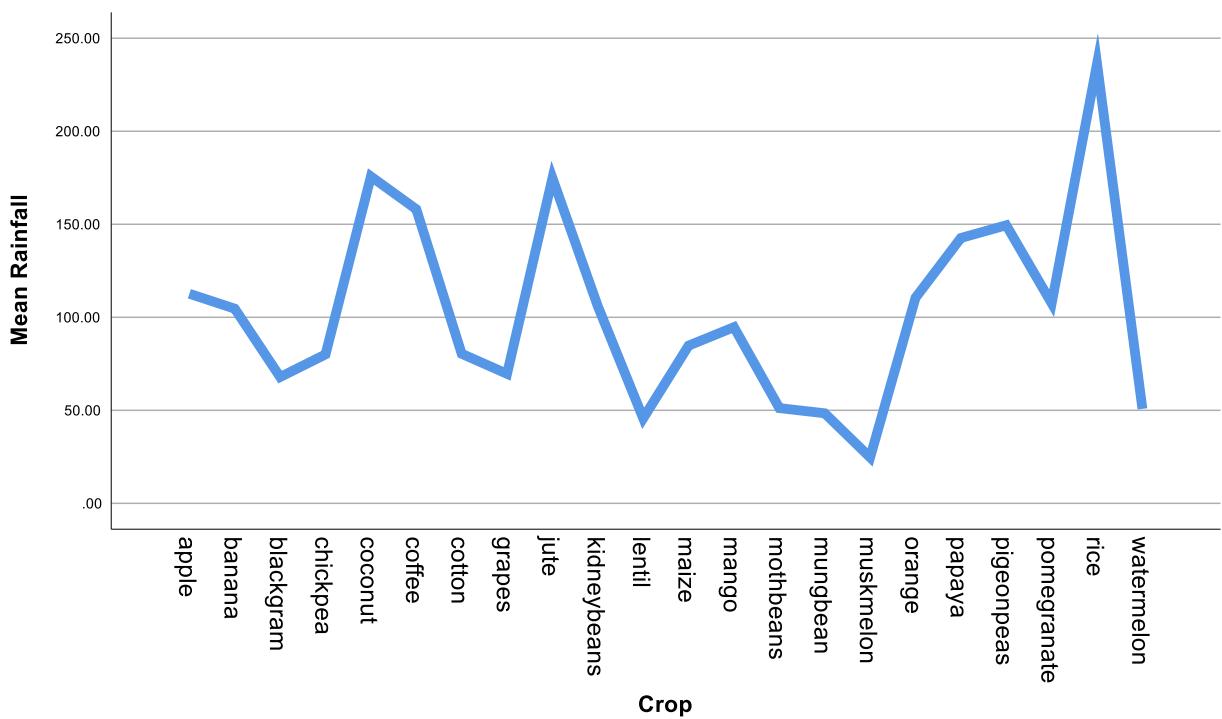


 **Simple Line Graph:**

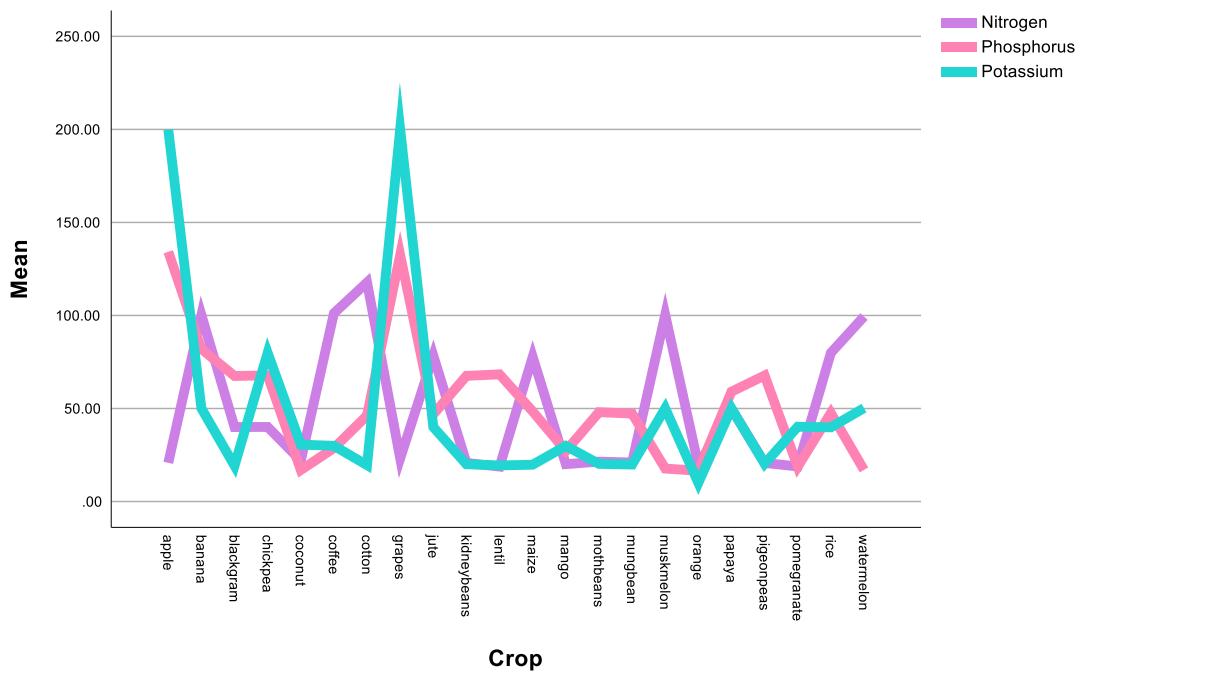


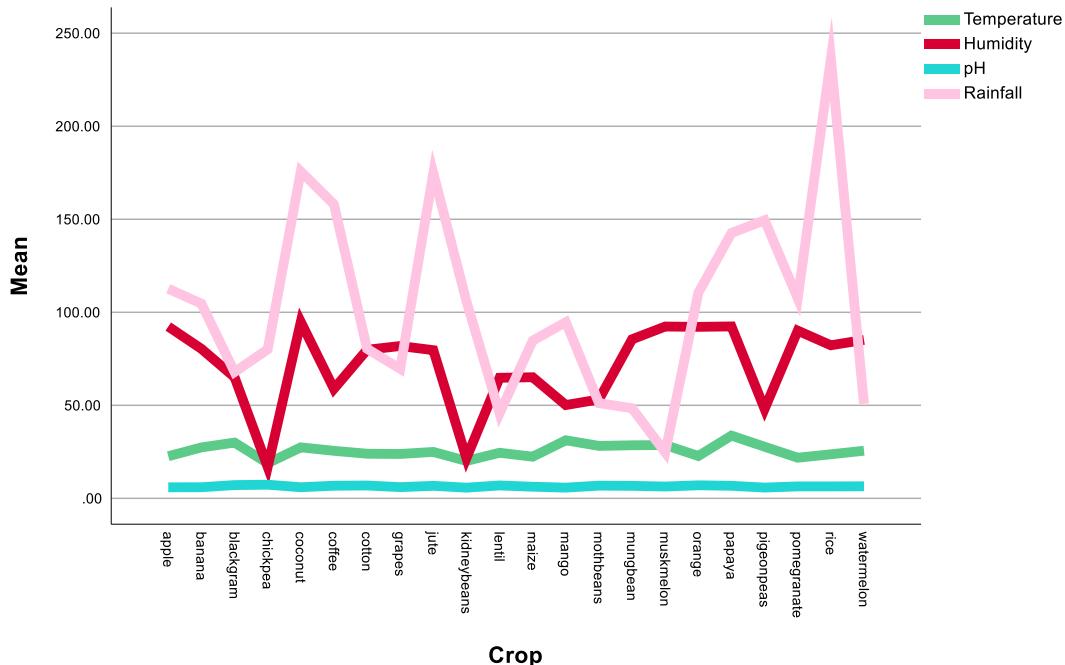




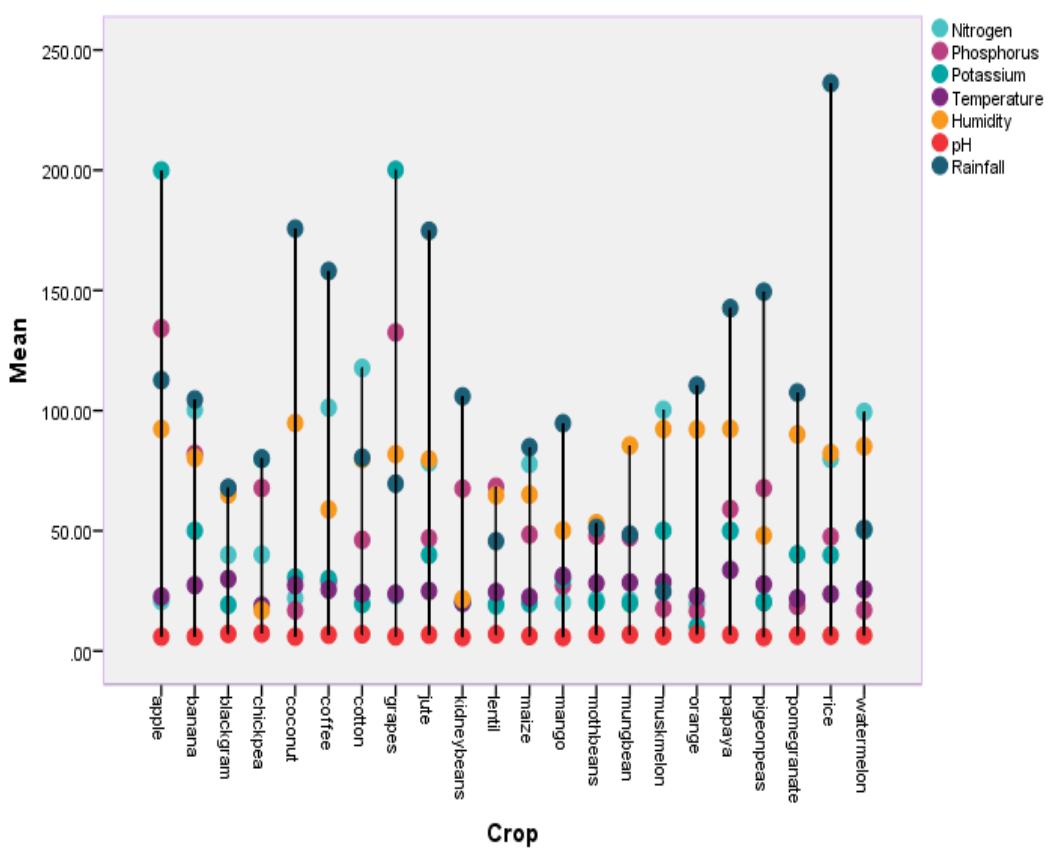


### Multiple Line Graph:

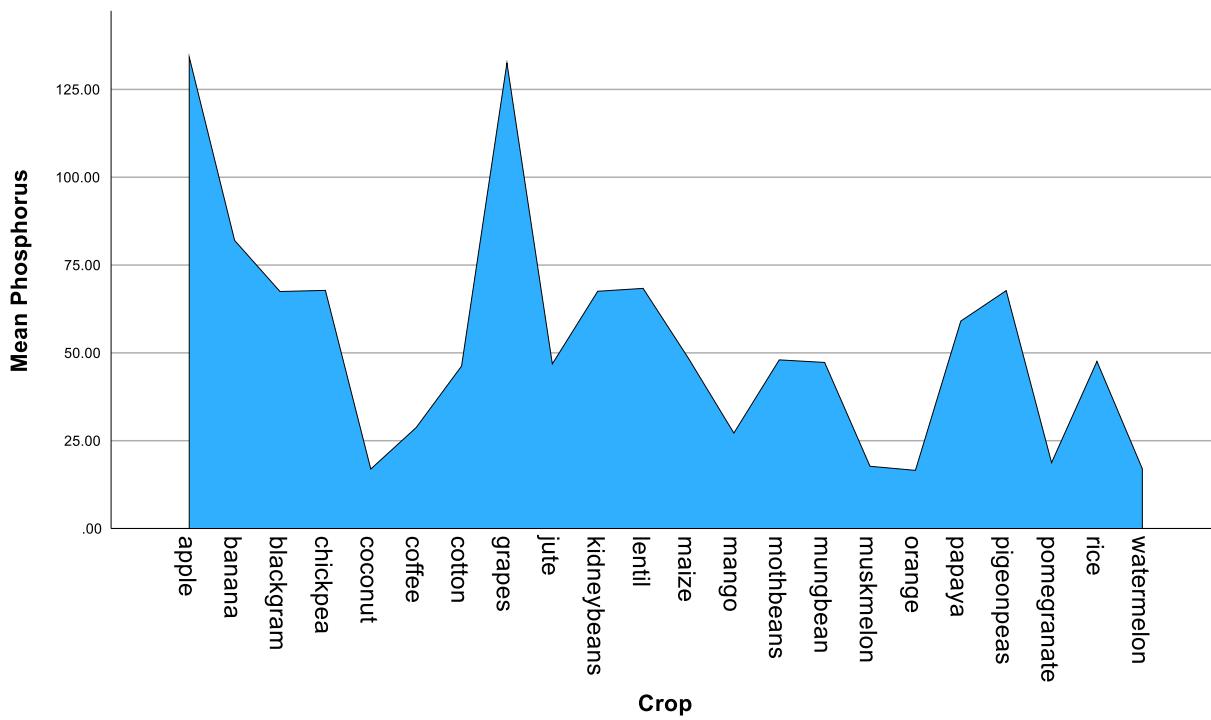
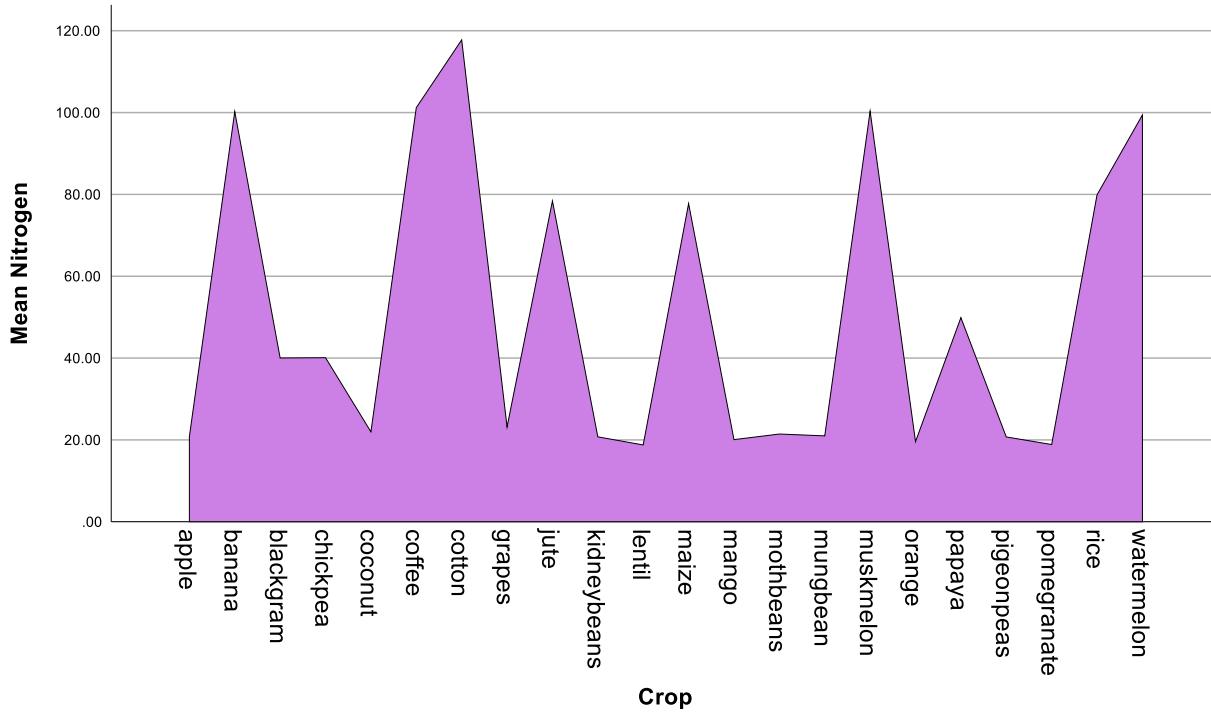


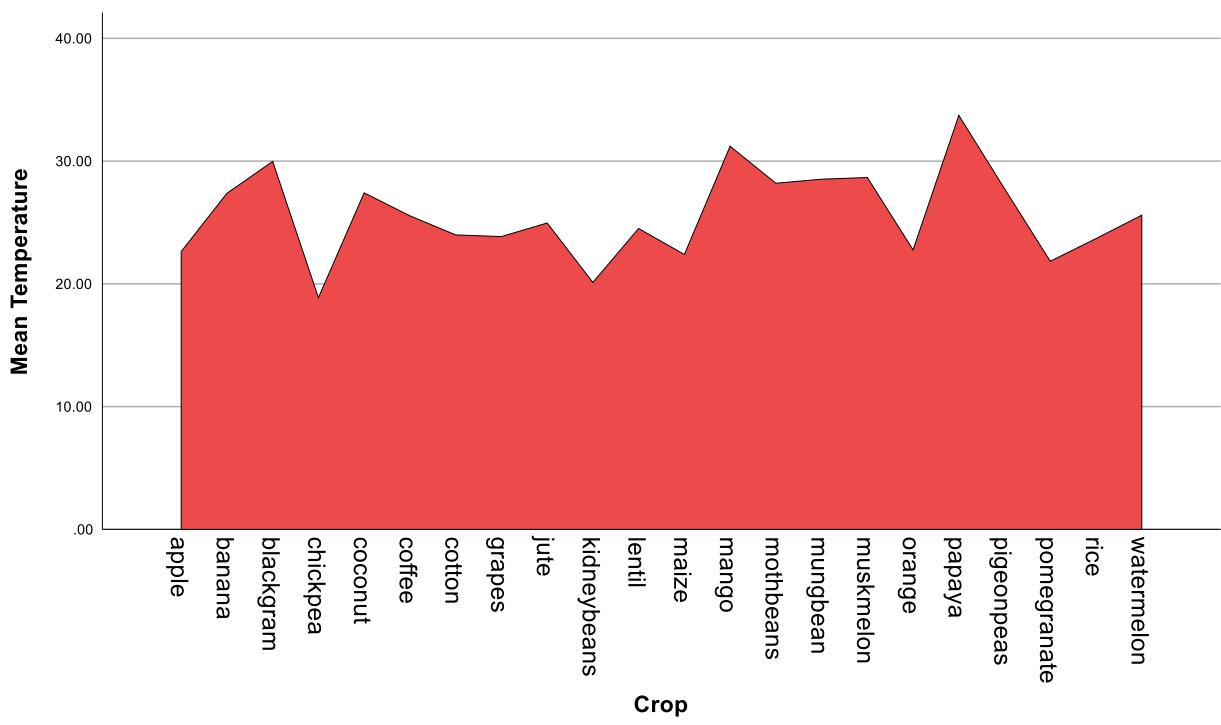
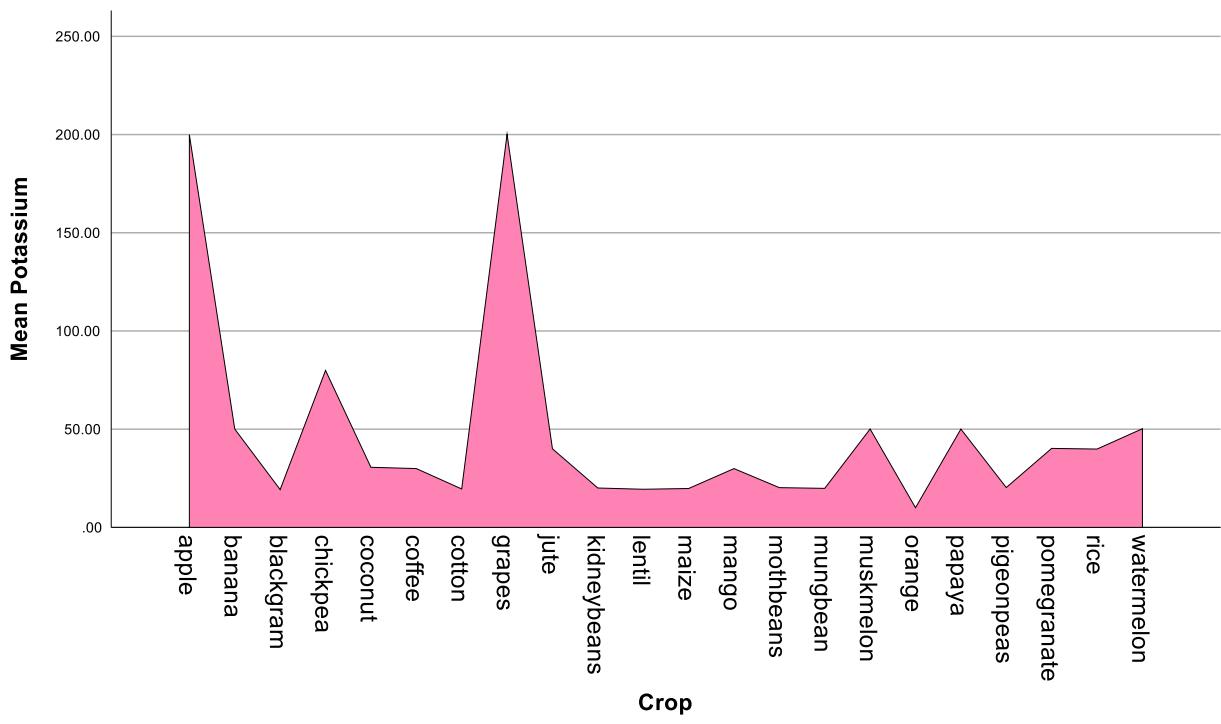


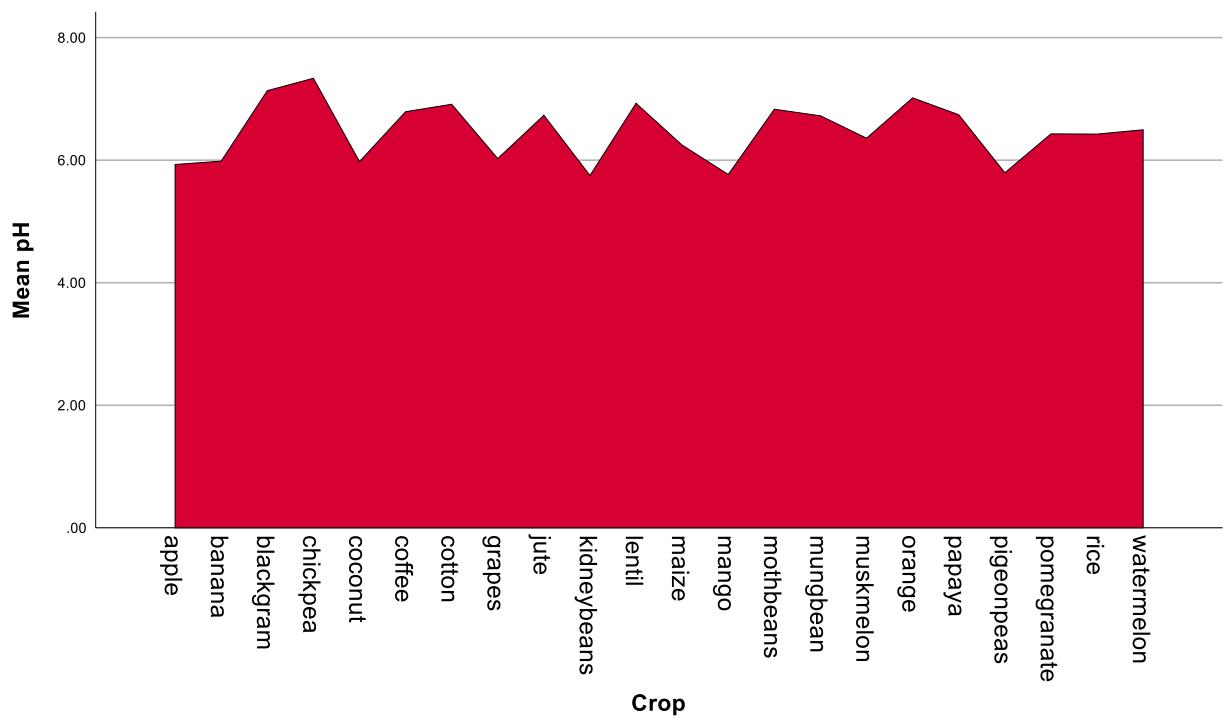
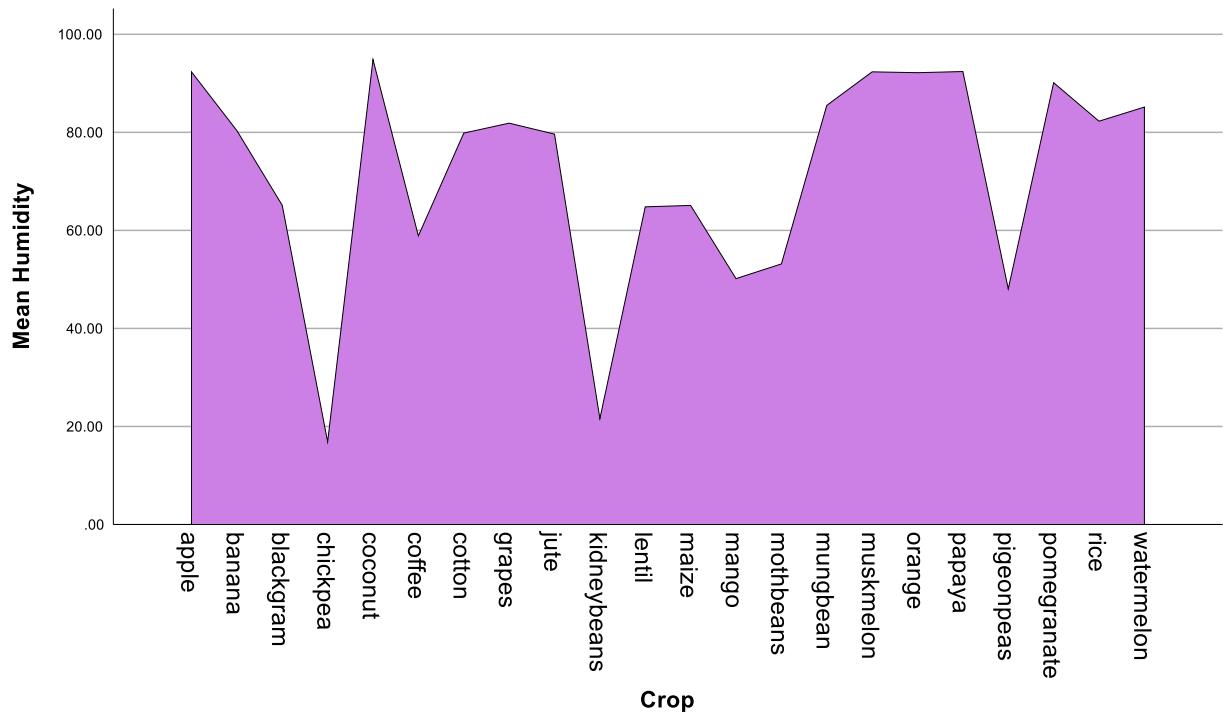
### ❖ Drop (Line) Line Graph:

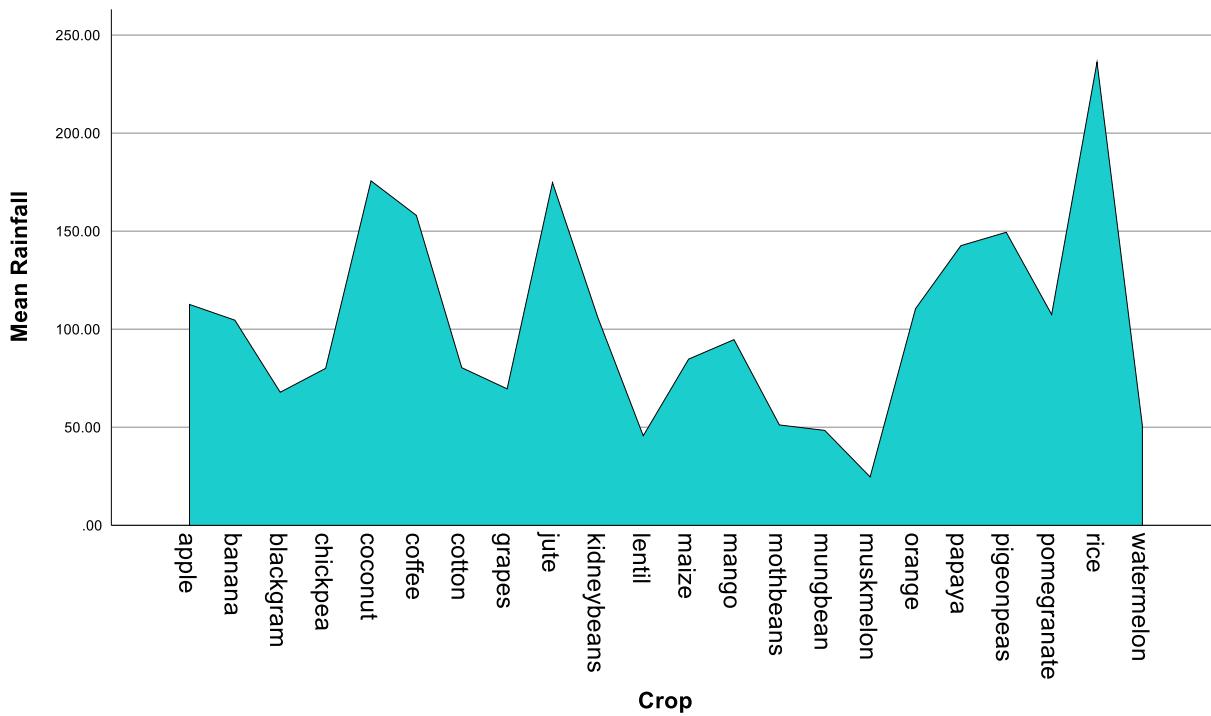


## Area Chart:

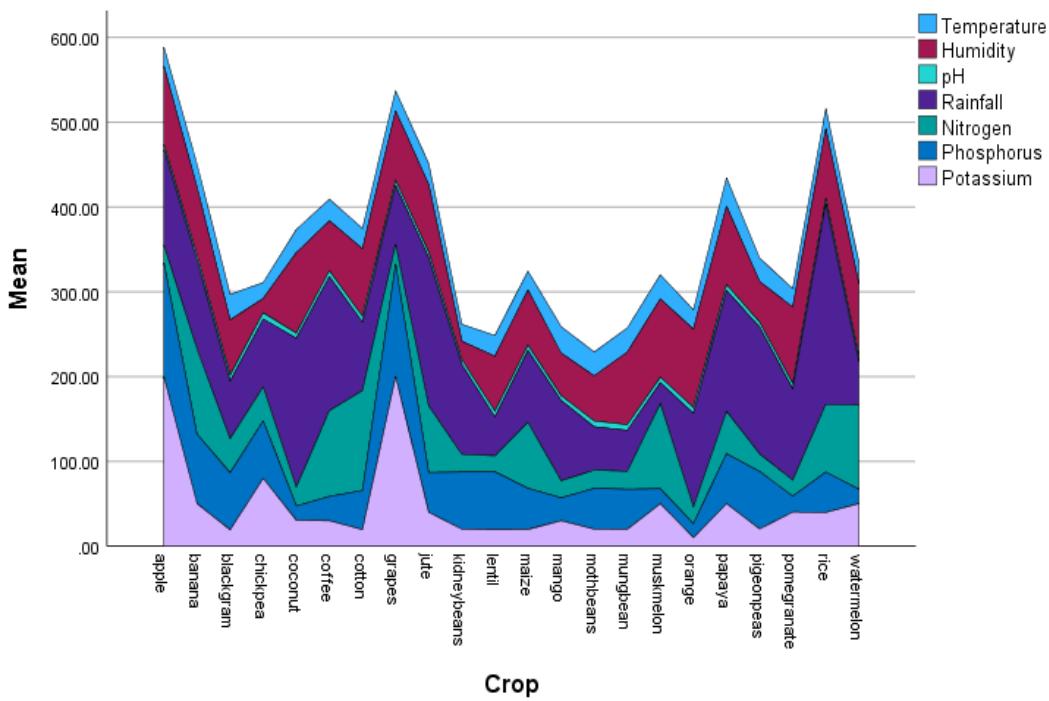




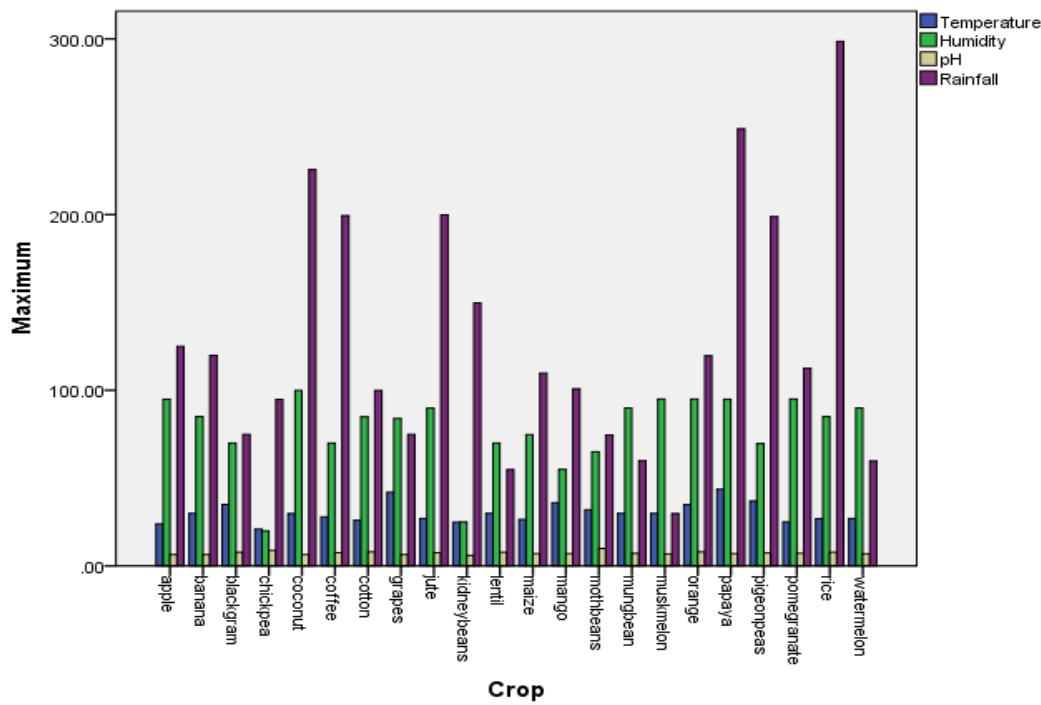
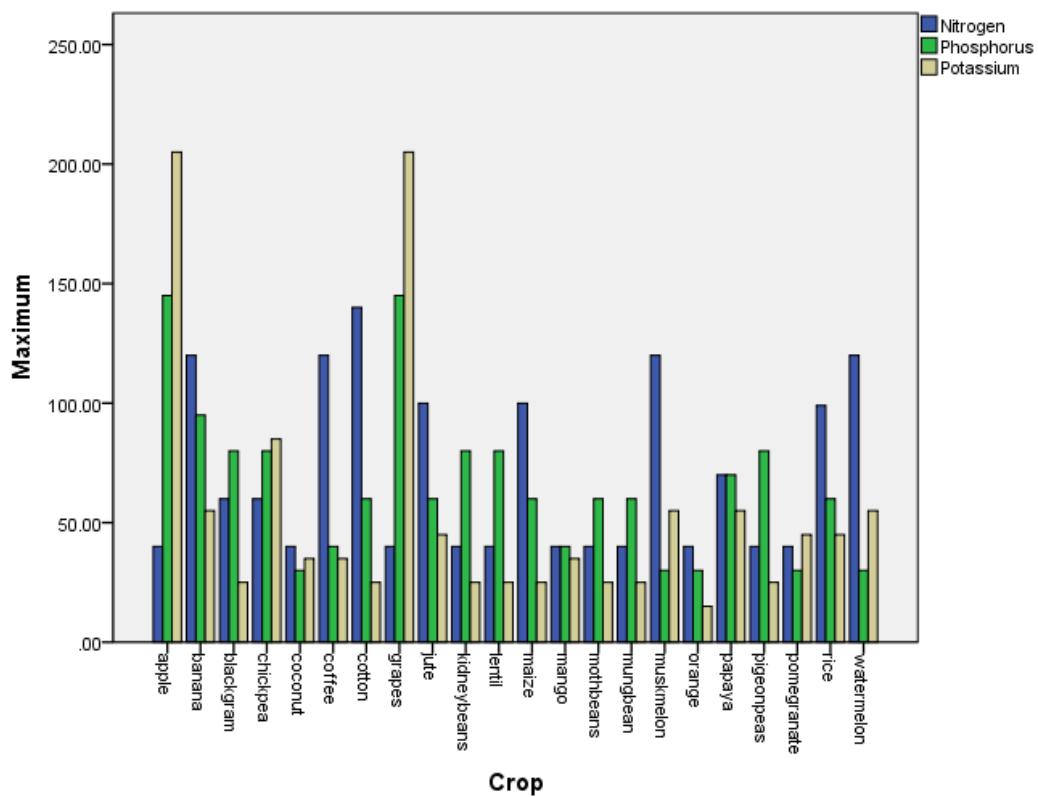




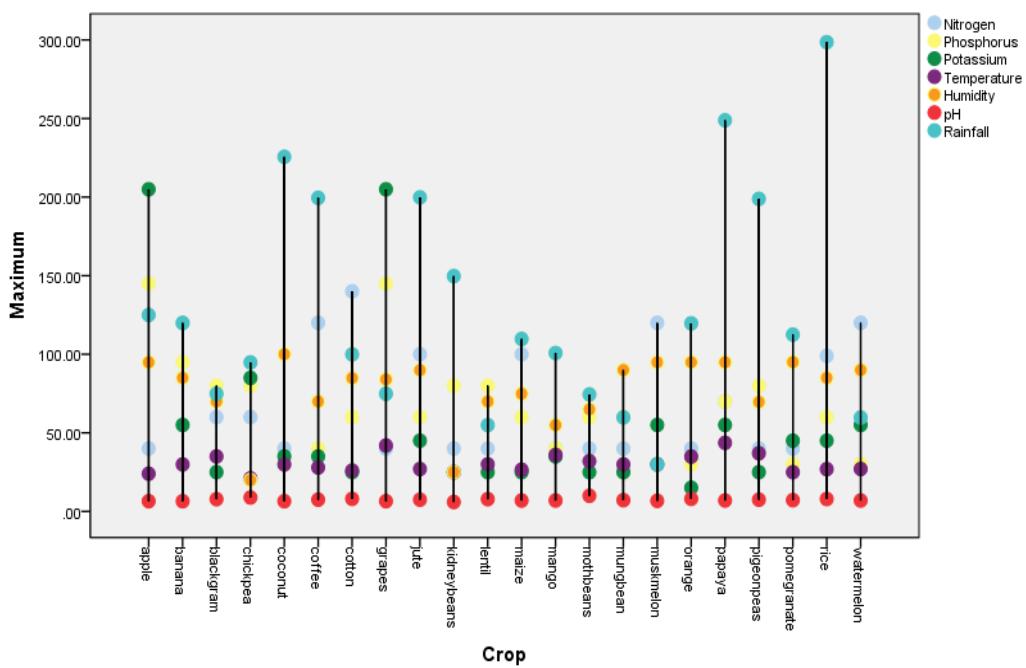
### ❖ Stacked Area Chart:



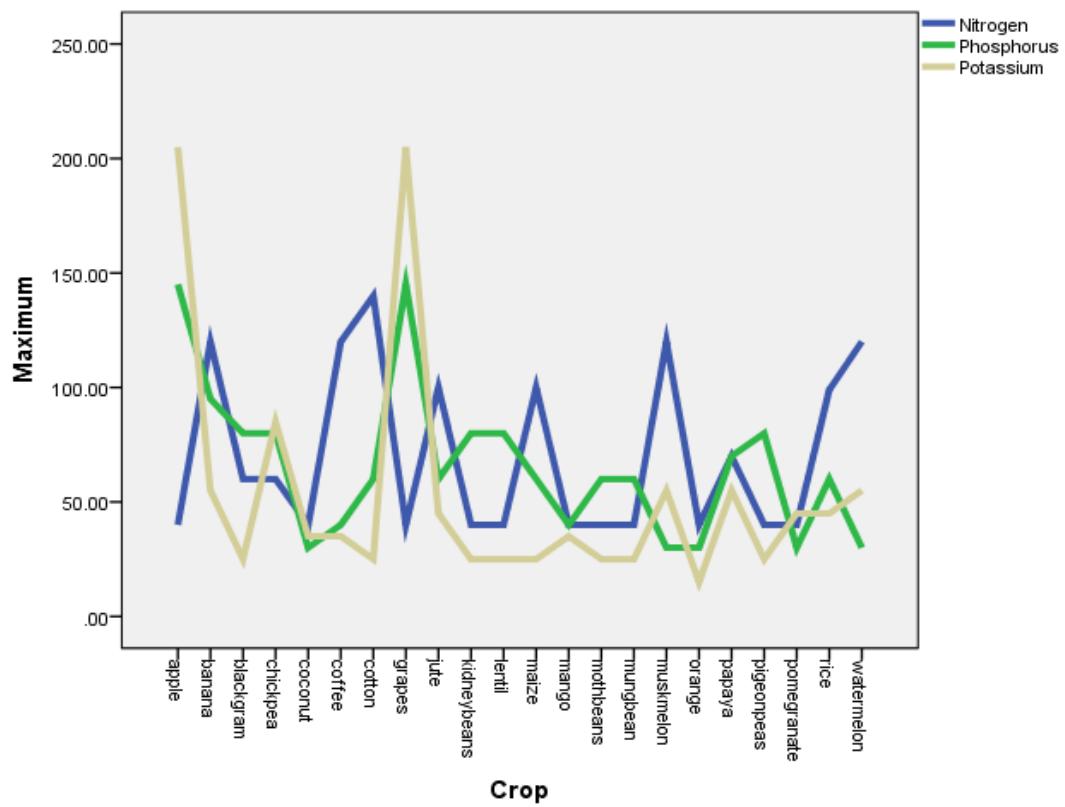
### ❖ Graph For Maximum: ❖ Clustered Bar Graph:

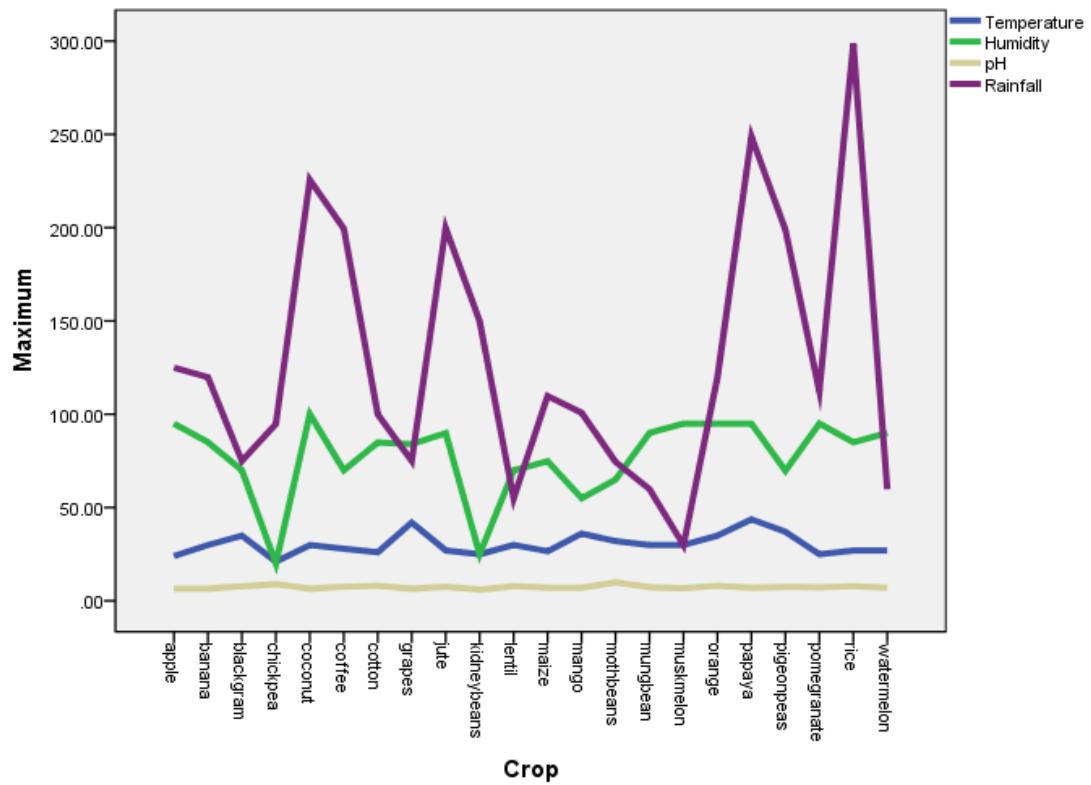


## ❖ Drop (Line) Line Chart:

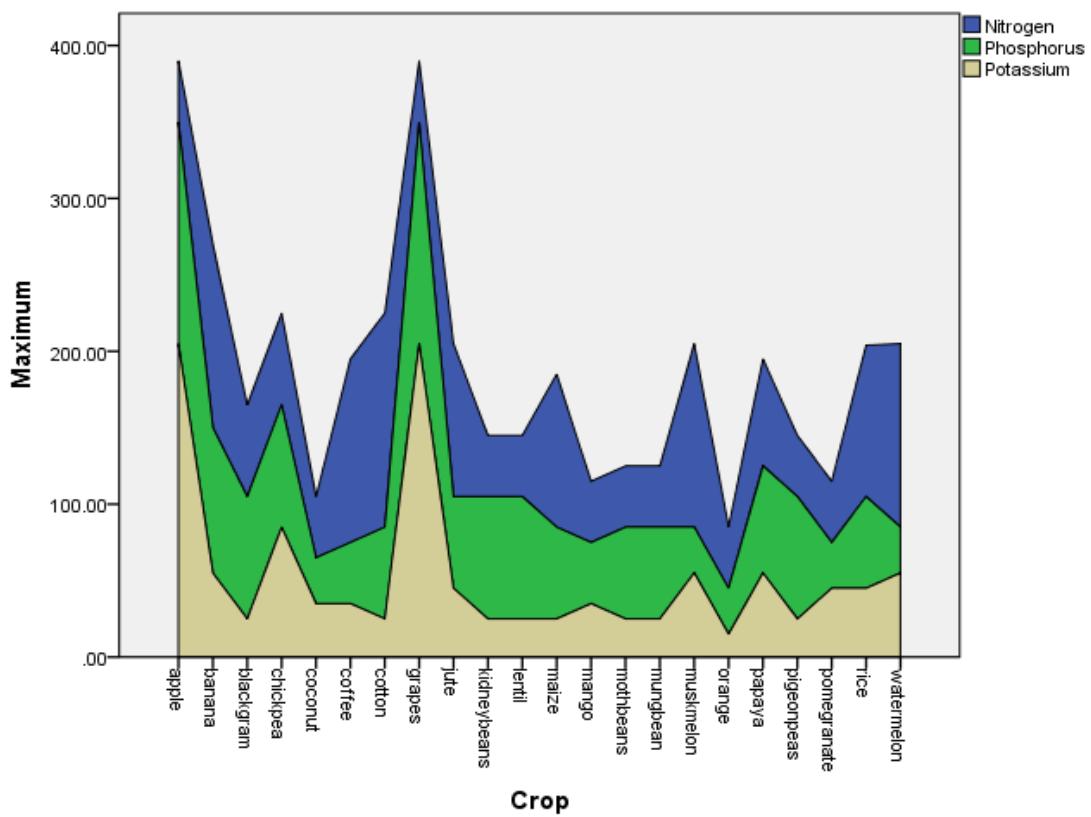


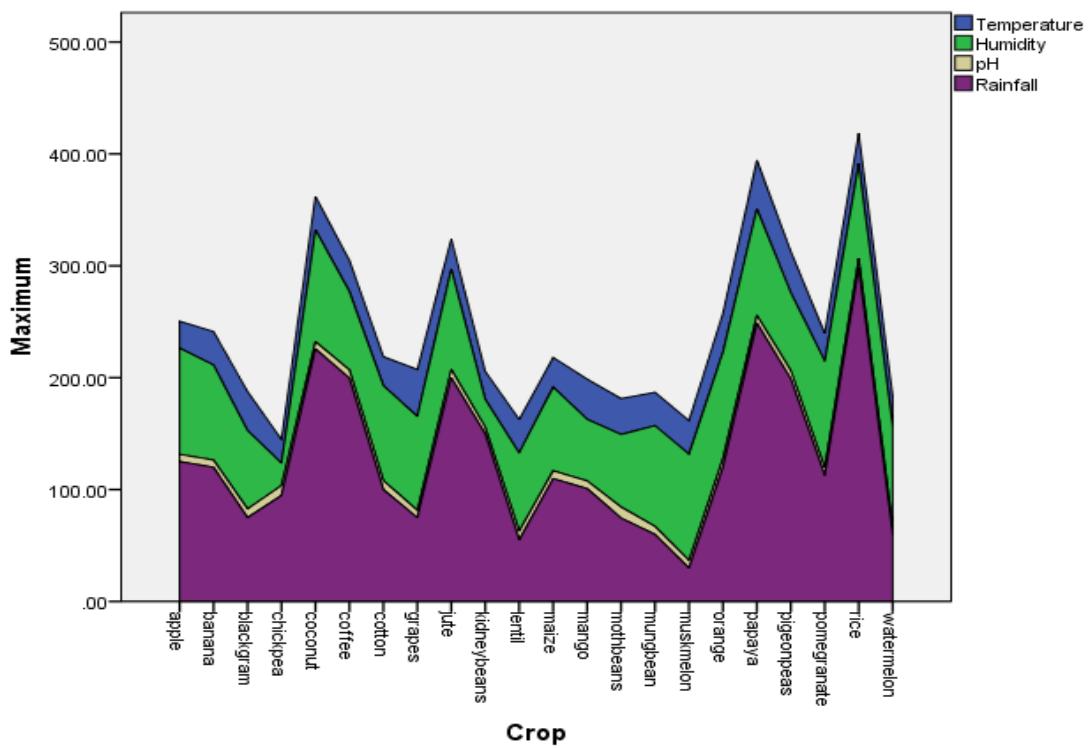
### Multiple Line Graph:



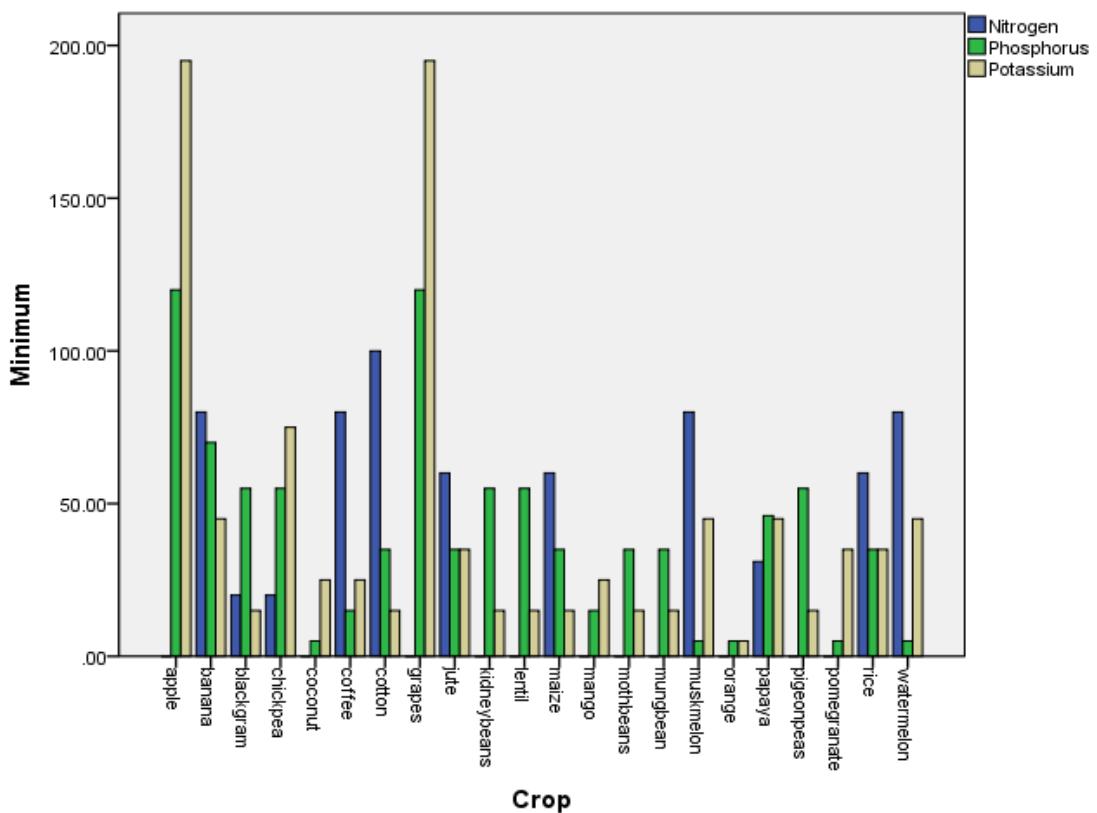


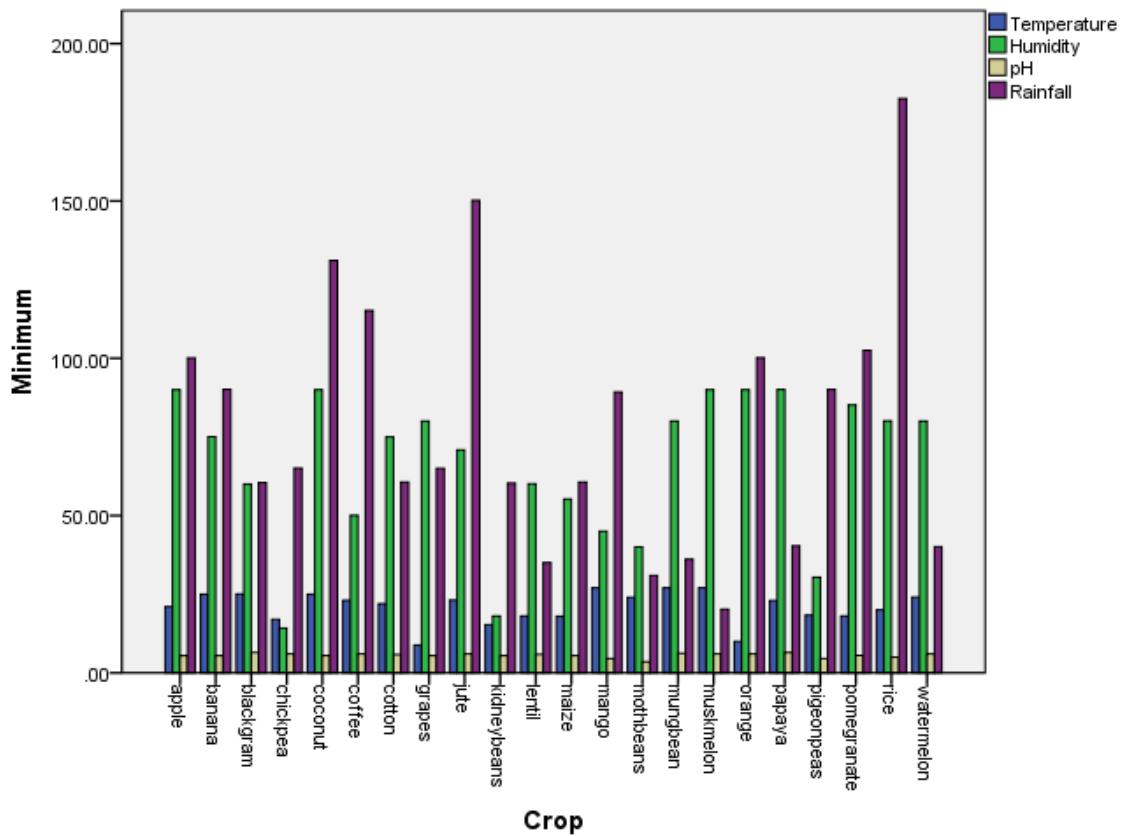
### ❖ Stacked Area Chart:



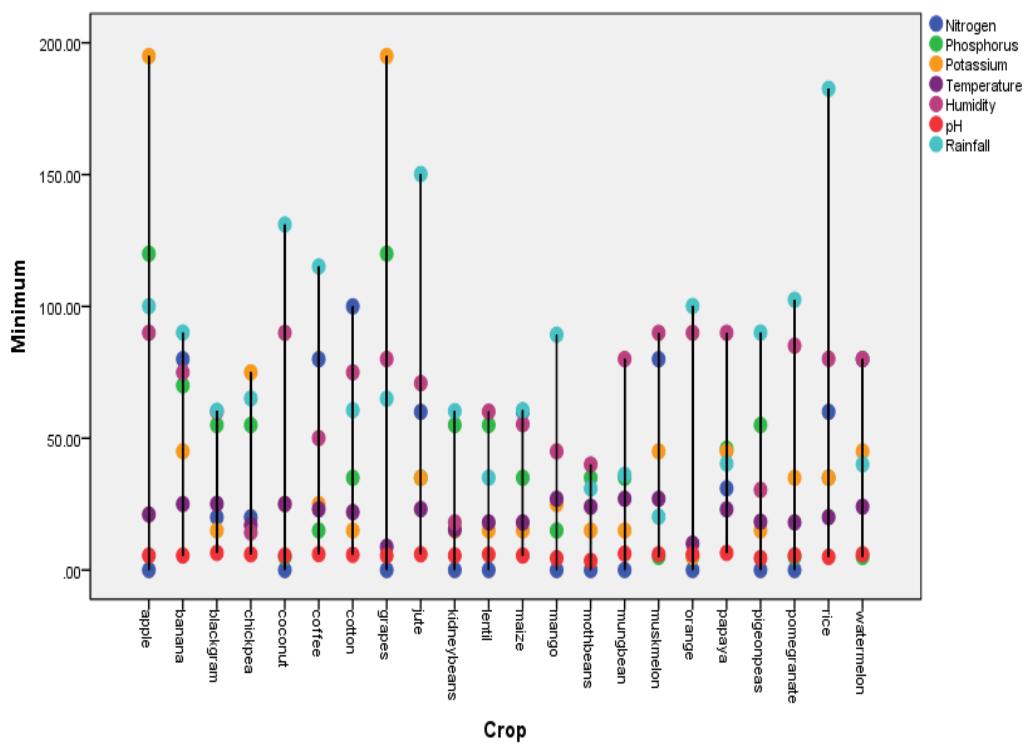


### Graph For Minimum: Clustered Bar Graph:

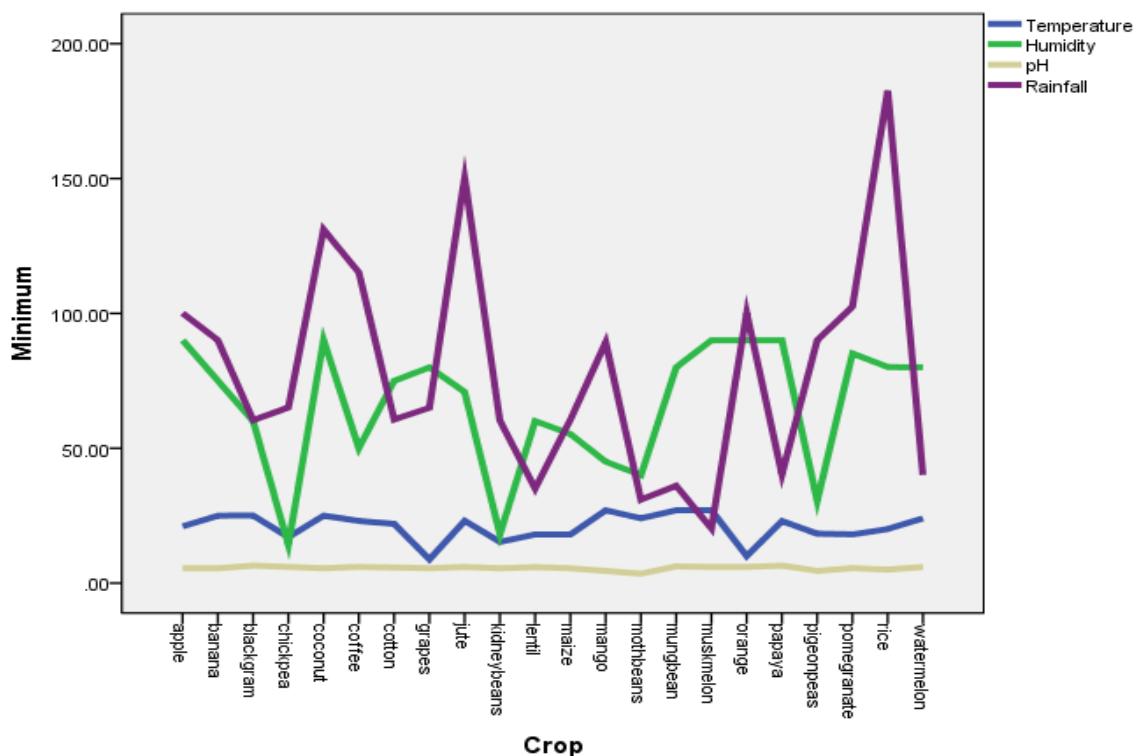
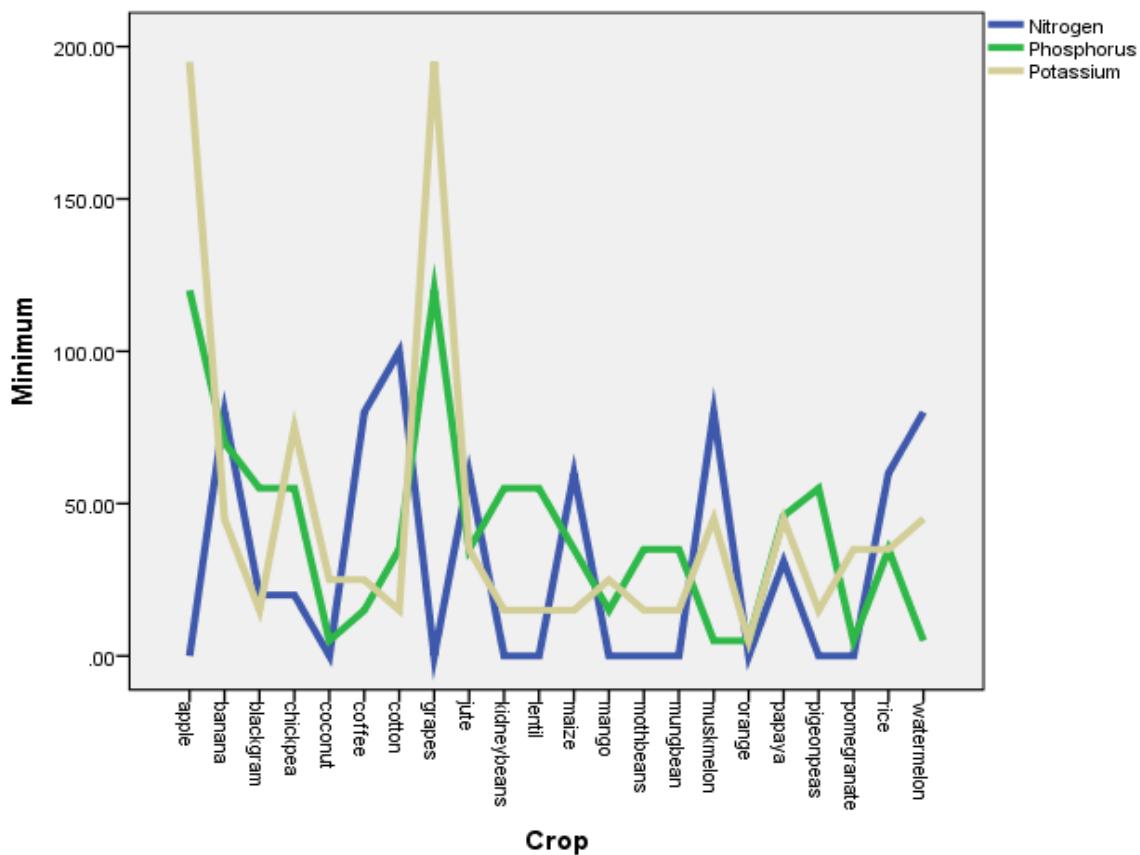




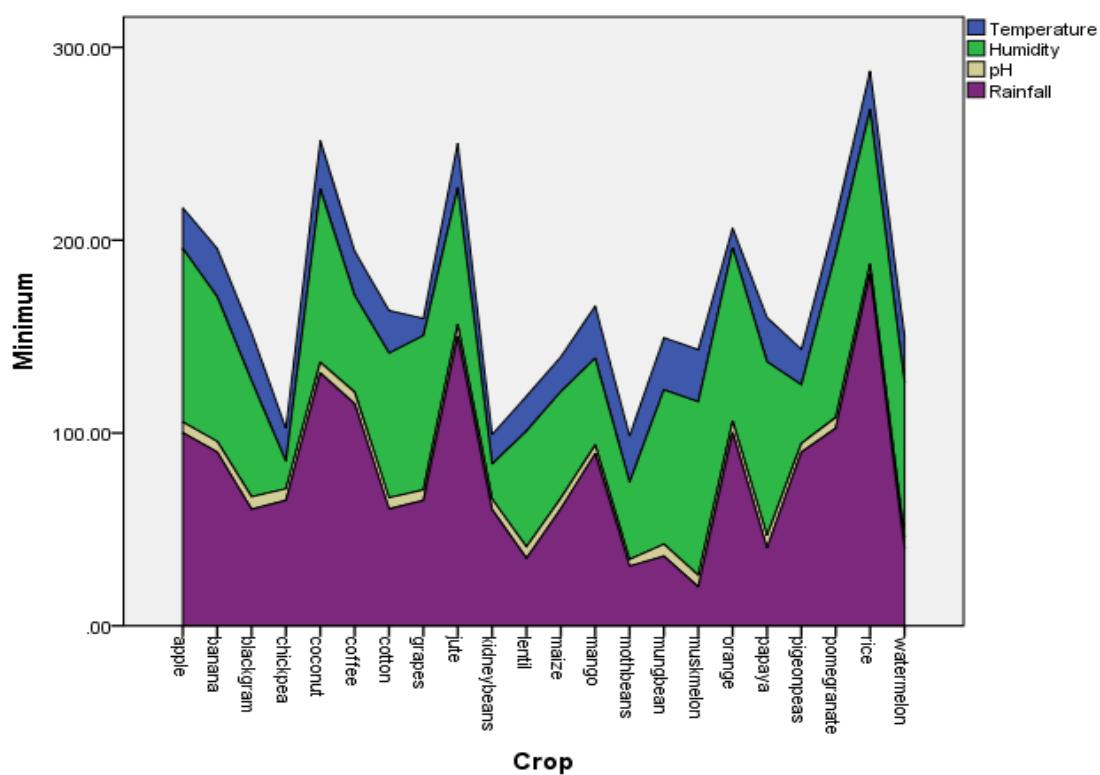
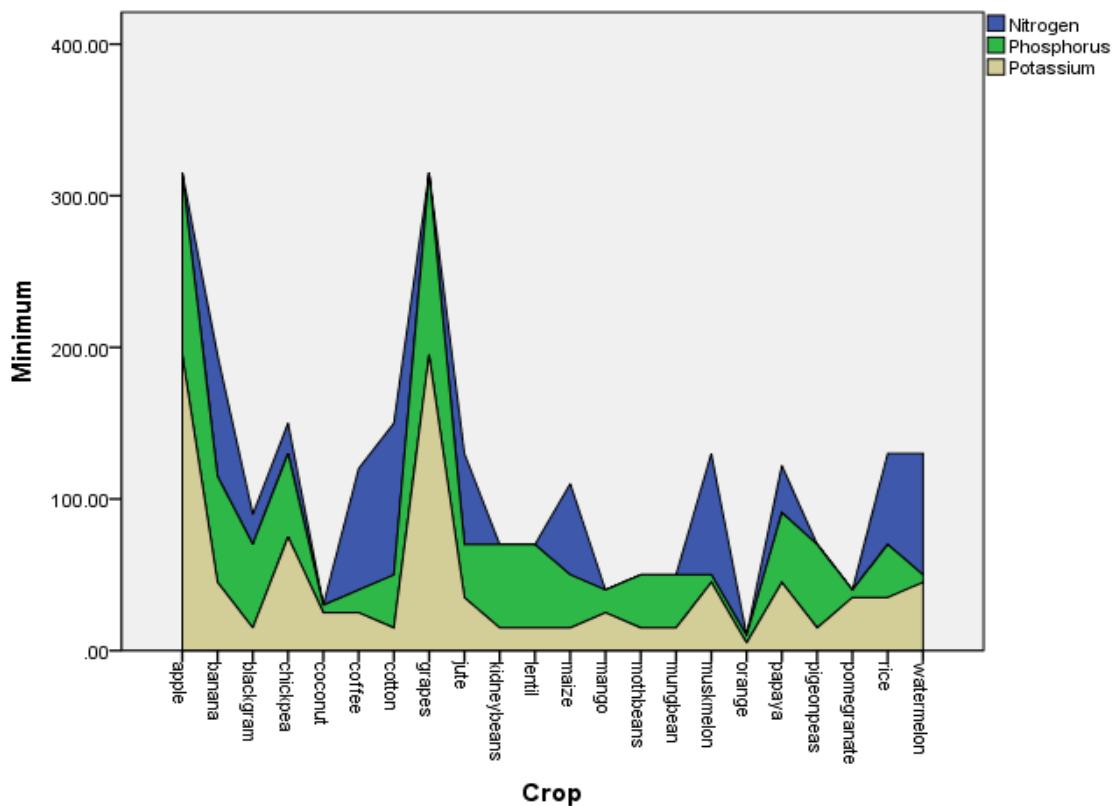
### ❖ Drop (Line) Line Chart:



 **Multiple Line Graph:**



## ❖ Stacked Area Chart:



### Frequencies(With Outlier):

Statistics								
		Nitrogen	Phosphorus	Potassium	Temperature	Humidity	pH	Rainfall
N	Valid	2200	2200	2200	2200	2200	2200	2200
	Missing	0	0	0	0	0	0	0
Mean	50.5518	53.3627	48.1491	25.6162	71.4818	6.4695	103.4637	
Std. Error of Mean	.78708	.70326	1.07982	.10796	.47467	.01650	1.17172	
Median	37.0000	51.0000	32.0000	25.5987	80.4731	6.4250	94.8676	
Mode	22.00*	60.00	17.00	8.83*	14.26*	3.50*	20.21*	
Std. Deviation	36.91733	32.98588	50.64793	5.06375	22.26381	.77394	54.95839	
Variance	1362.890	1088.068	2565.213	25.642	495.677	.599	3020.424	
Skewness	.510	1.011	2.375	.185	-1.092	.284	.966	
Std. Error of Skewness	.052	.052	.052	.052	.052	.052	.052	
Kurtosis	-1.058	.860	4.449	1.233	.302	1.656	.607	
Std. Error of Kurtosis	.104	.104	.104	.104	.104	.104	.104	
Range	140.00	140.00	200.00	34.85	85.72	6.43	278.35	
Minimum	.00	5.00	5.00	8.83	14.26	3.50	20.21	
Maximum	140.00	145.00	205.00	43.68	99.98	9.94	298.56	
Sum	111214.00	117398.00	105928.00	56355.74	157259.91	14232.86	227620.04	
a. Multiple modes exist. The smallest value is shown.								

### Descriptives(With Outlier):

Descriptive Statistics

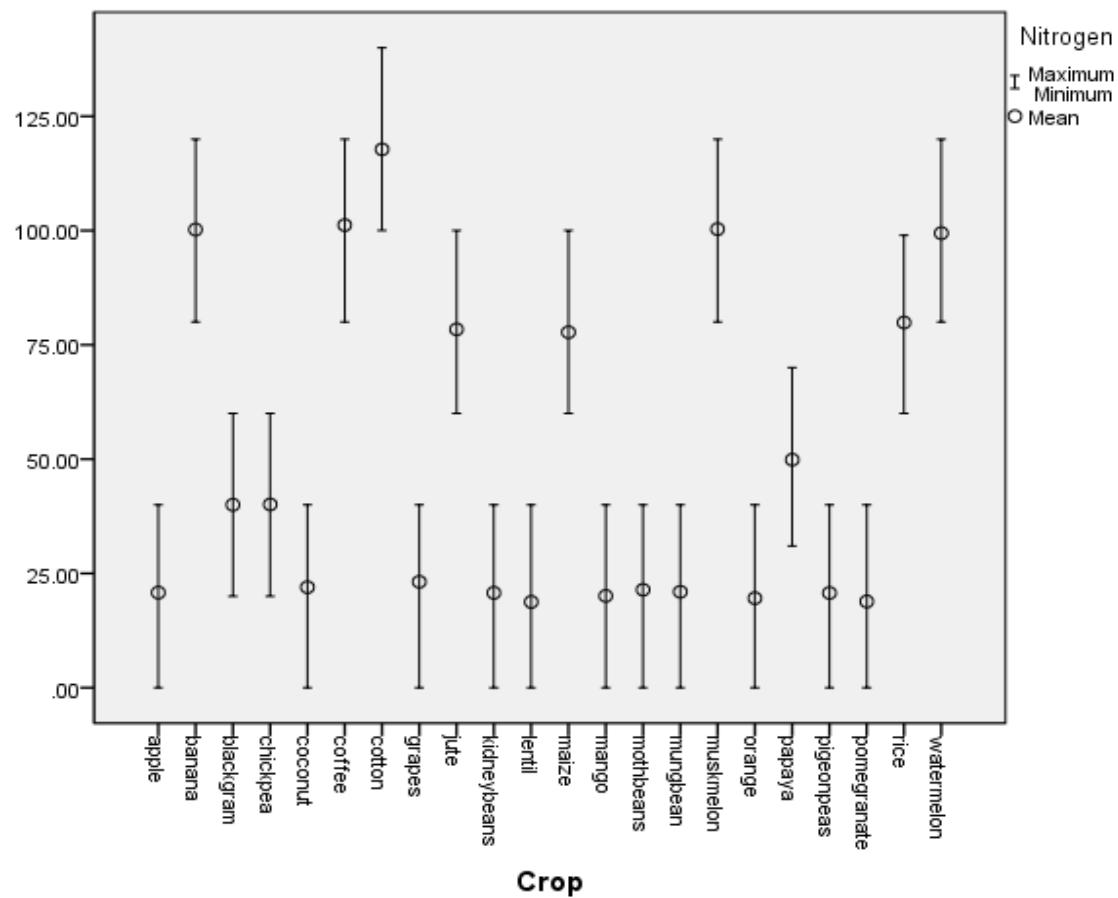
	N	Range	Minimum	Maximum	Sum	Mean	
	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error
Nitrogen	2200	140.00	.00	140.00	111214.00	50.5518	.78708
Phosphorus	2200	140.00	5.00	145.00	117398.00	53.3627	.70326
Potassium	2200	200.00	5.00	205.00	105928.00	48.1491	1.07982
Temperature	2200	34.85	8.83	43.68	56355.74	25.6162	.10796
Humidity	2200	85.72	14.26	99.98	157259.91	71.4818	.47467
pH	2200	6.43	3.50	9.94	14232.86	6.4695	.01650
Rainfall	2200	278.35	20.21	298.56	227620.04	103.4637	1.17172

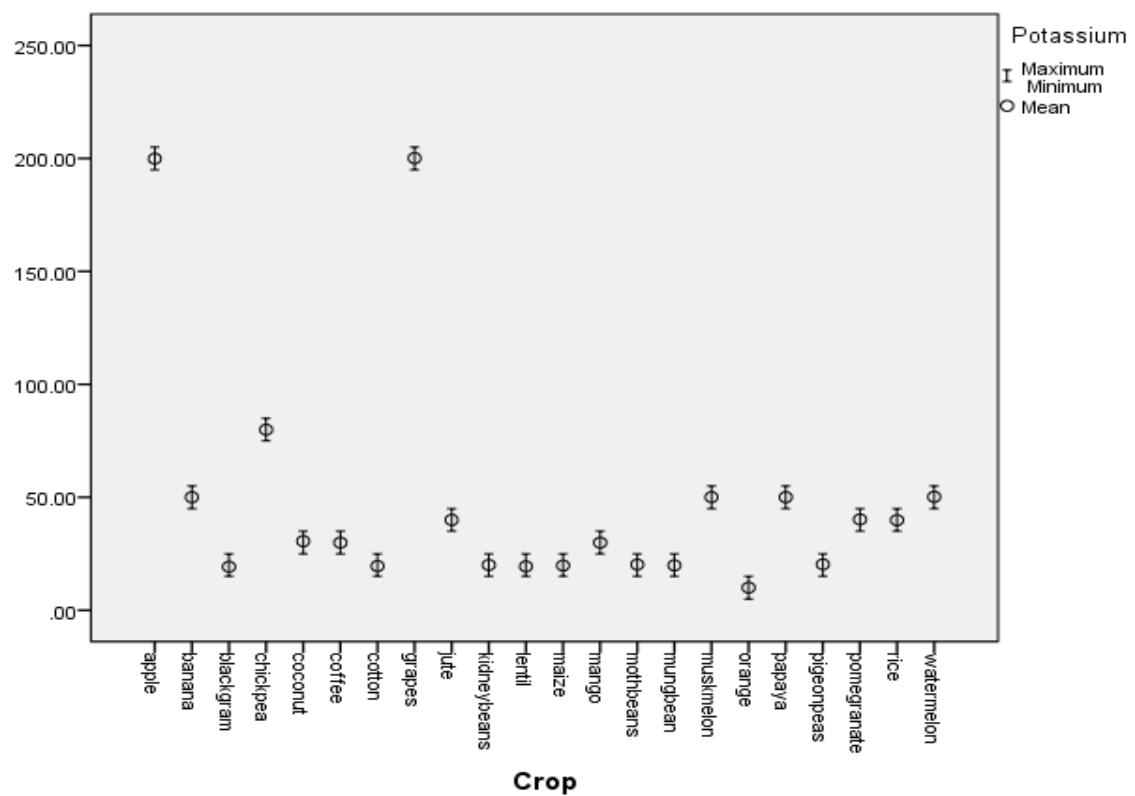
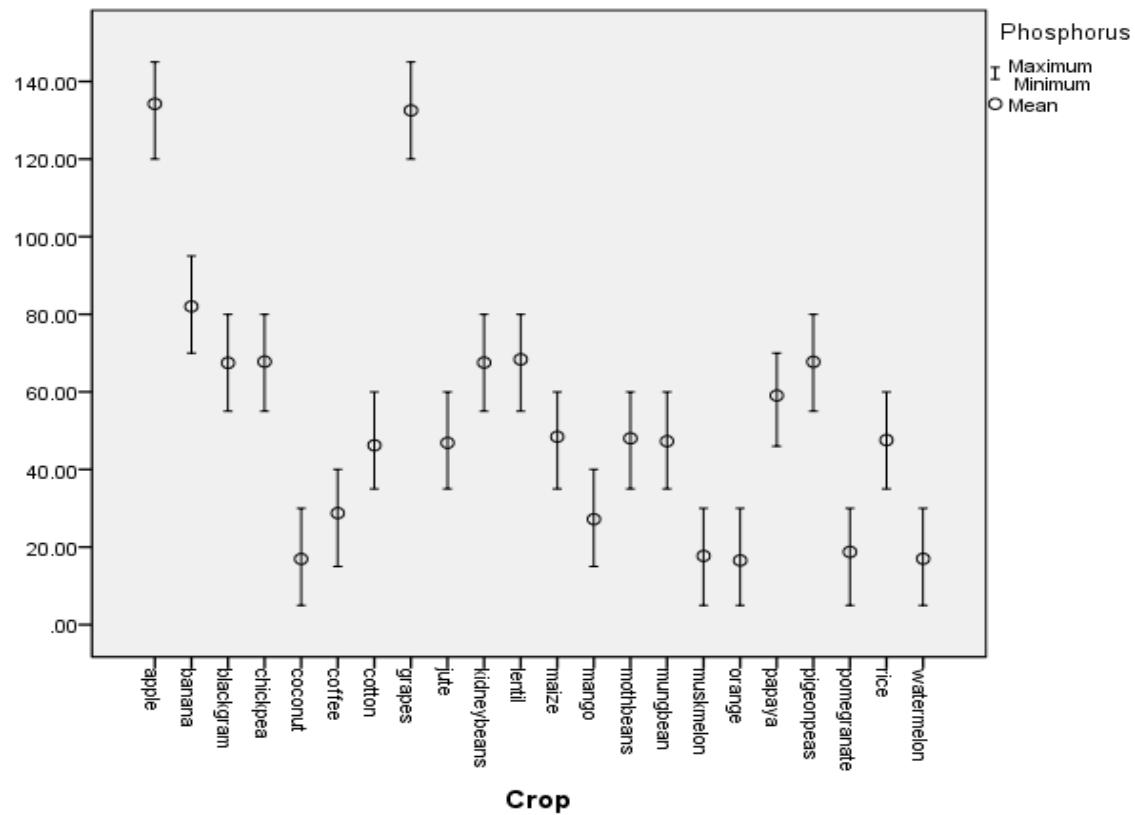
<b>Valid N (listwise)</b>	<b>2200</b>						
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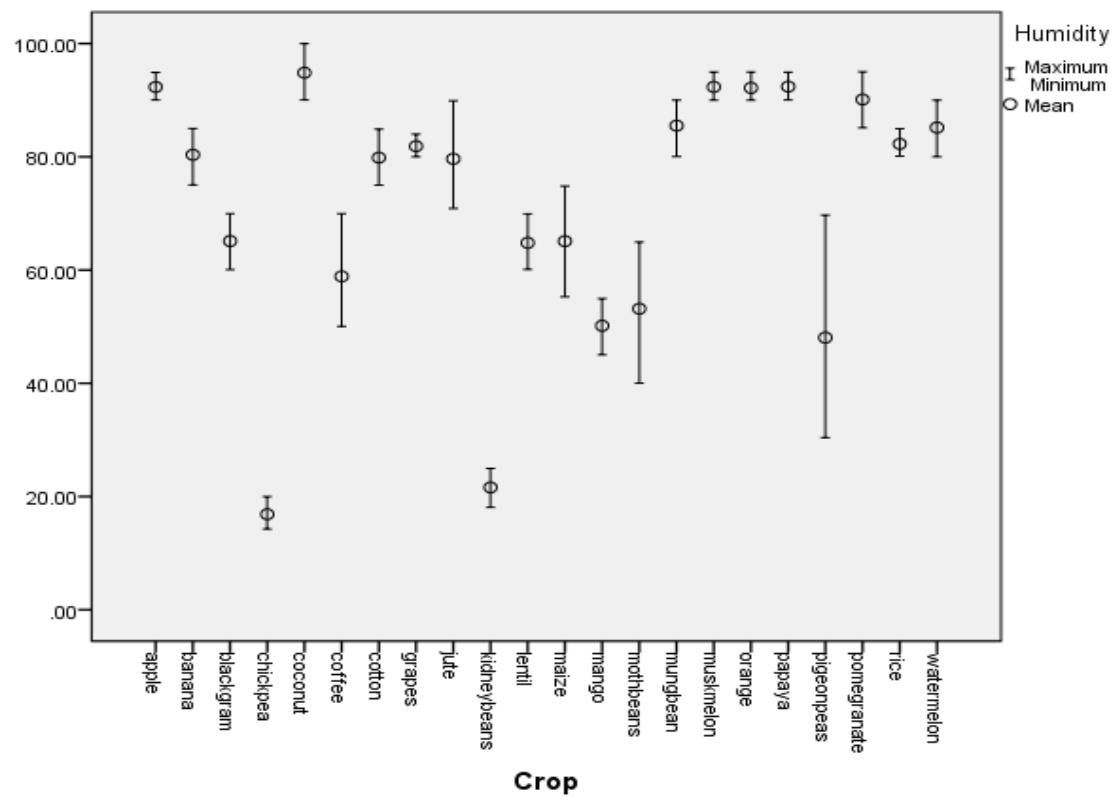
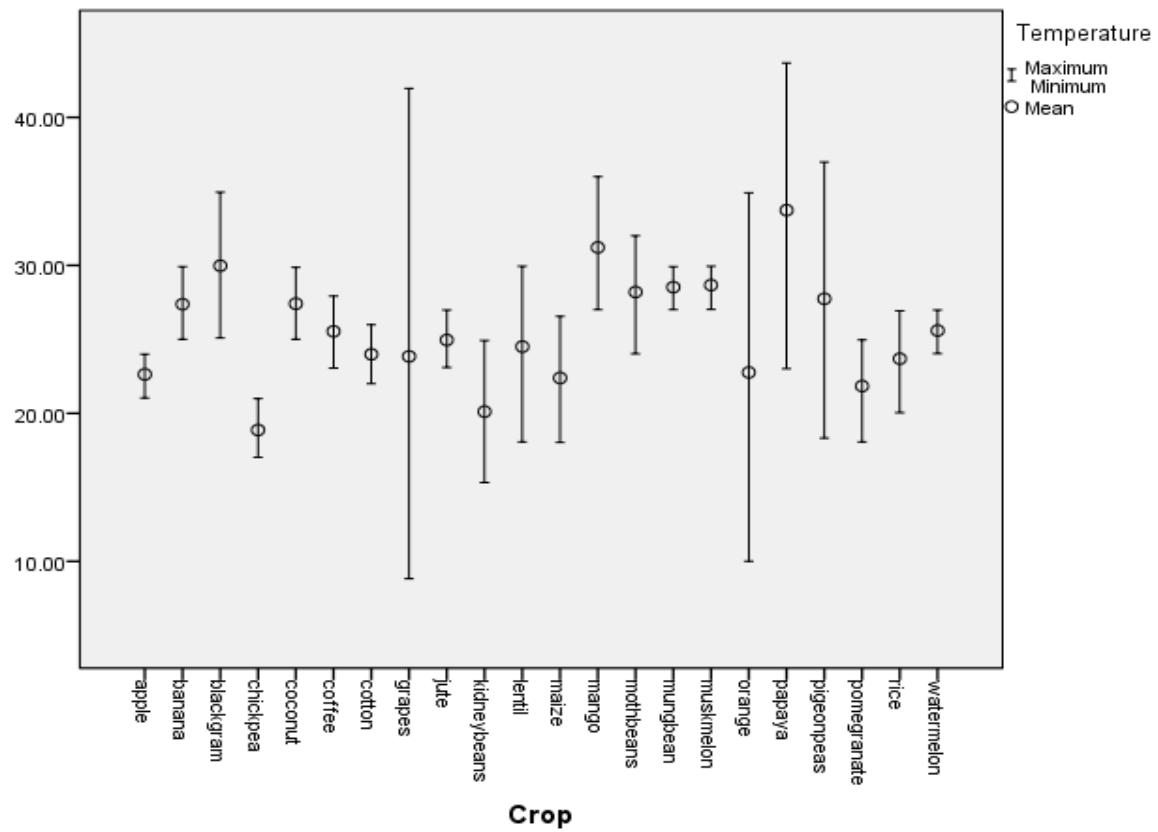
### Descriptive Statistics

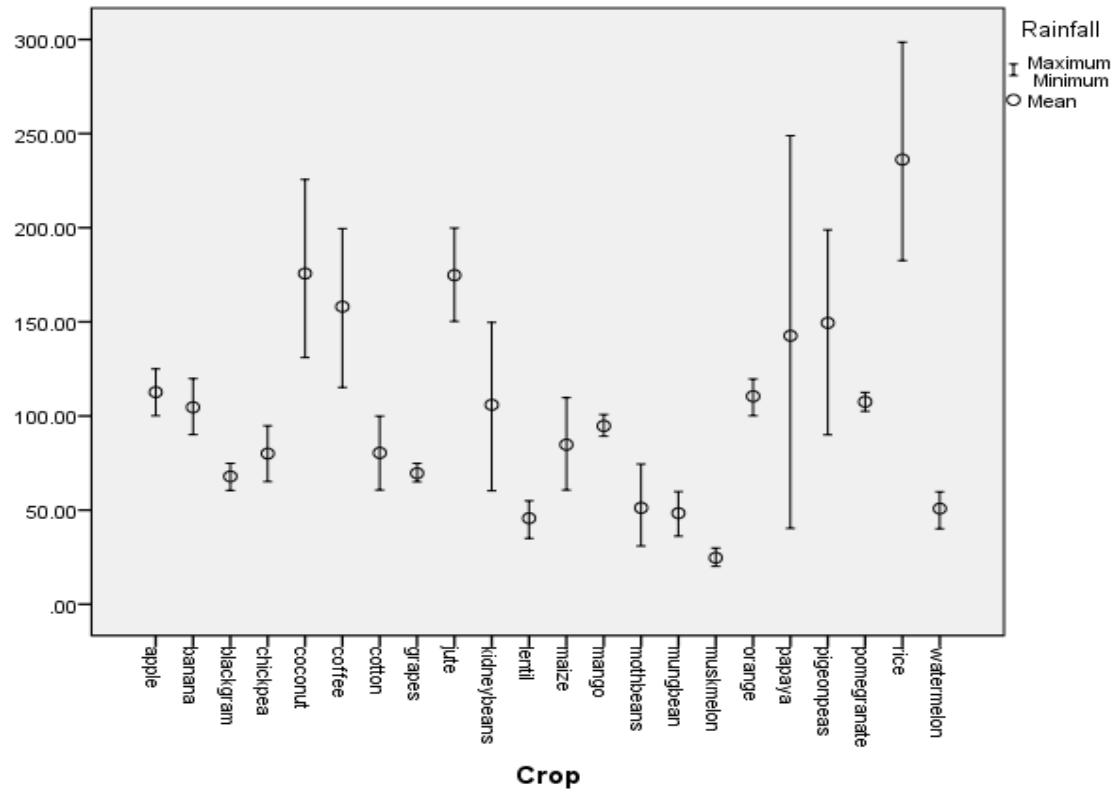
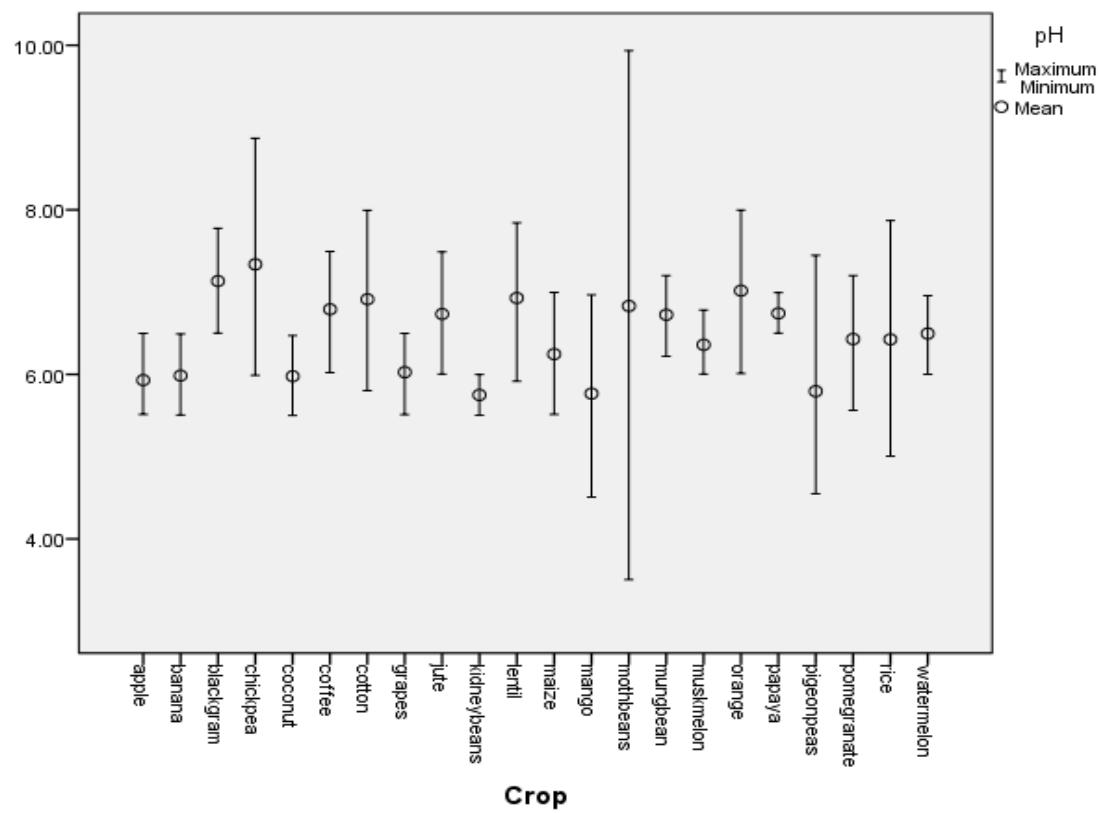
	<b>Std. Deviation</b>	<b>Variance</b>	<b>Skewness</b>		<b>Kurtosis</b>	
	<b>Statistic</b>	<b>Statistic</b>	<b>Statistic</b>	<b>Std. Error</b>	<b>Statistic</b>	<b>Std. Error</b>
<b>Nitrogen</b>	<b>36.91733</b>	<b>1362.890</b>	<b>.510</b>	<b>.052</b>	<b>-1.058</b>	<b>.104</b>
<b>Phosphorus</b>	<b>32.98588</b>	<b>1088.068</b>	<b>1.011</b>	<b>.052</b>	<b>.860</b>	<b>.104</b>
<b>Potassium</b>	<b>50.64793</b>	<b>2565.213</b>	<b>2.375</b>	<b>.052</b>	<b>4.449</b>	<b>.104</b>
<b>Temperature</b>	<b>5.06375</b>	<b>25.642</b>	<b>.185</b>	<b>.052</b>	<b>1.233</b>	<b>.104</b>
<b>Humidity</b>	<b>22.26381</b>	<b>495.677</b>	<b>-1.092</b>	<b>.052</b>	<b>.302</b>	<b>.104</b>
<b>pH</b>	<b>.77394</b>	<b>.599</b>	<b>.284</b>	<b>.052</b>	<b>1.656</b>	<b>.104</b>
<b>Rainfall</b>	<b>54.95839</b>	<b>3020.424</b>	<b>.966</b>	<b>.052</b>	<b>.607</b>	<b>.104</b>
<b>Valid N (listwise)</b>						

### High-Low Chart:

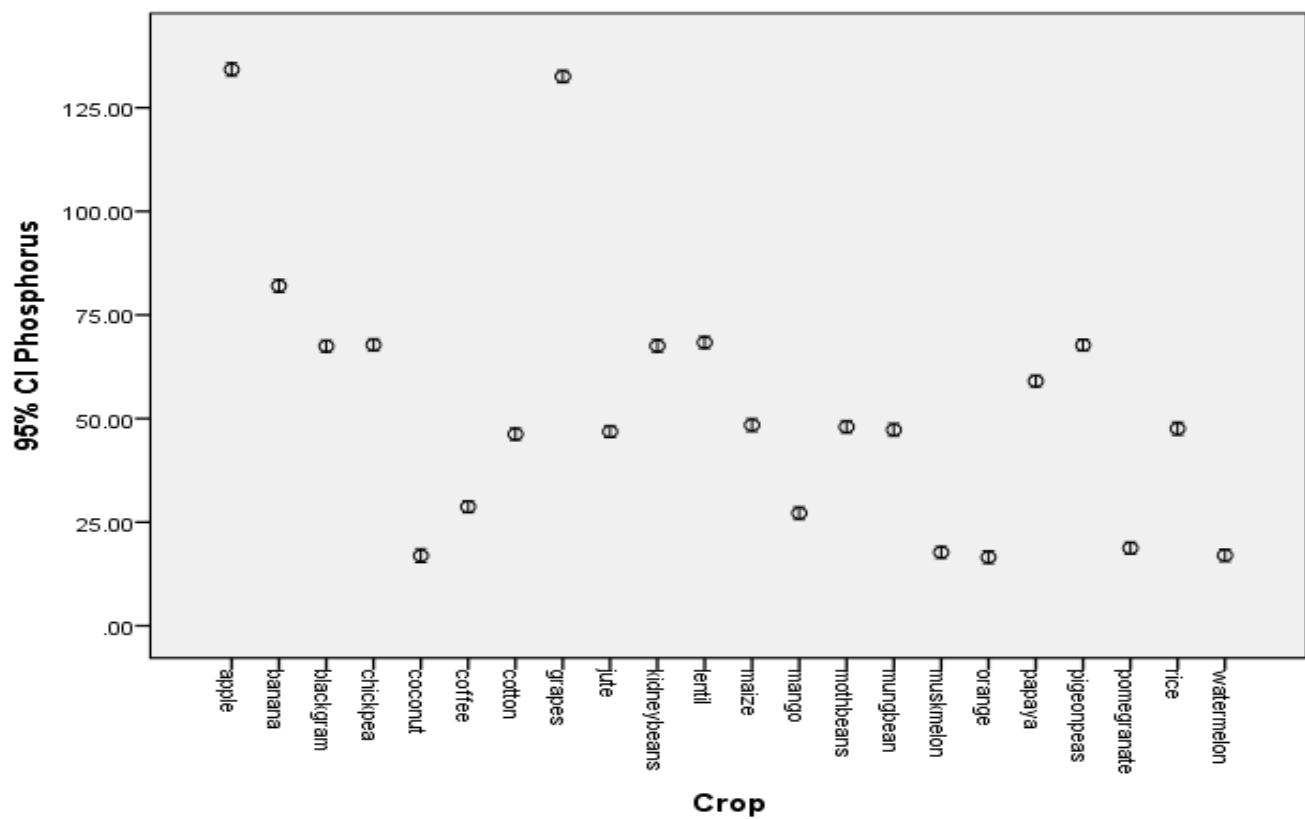
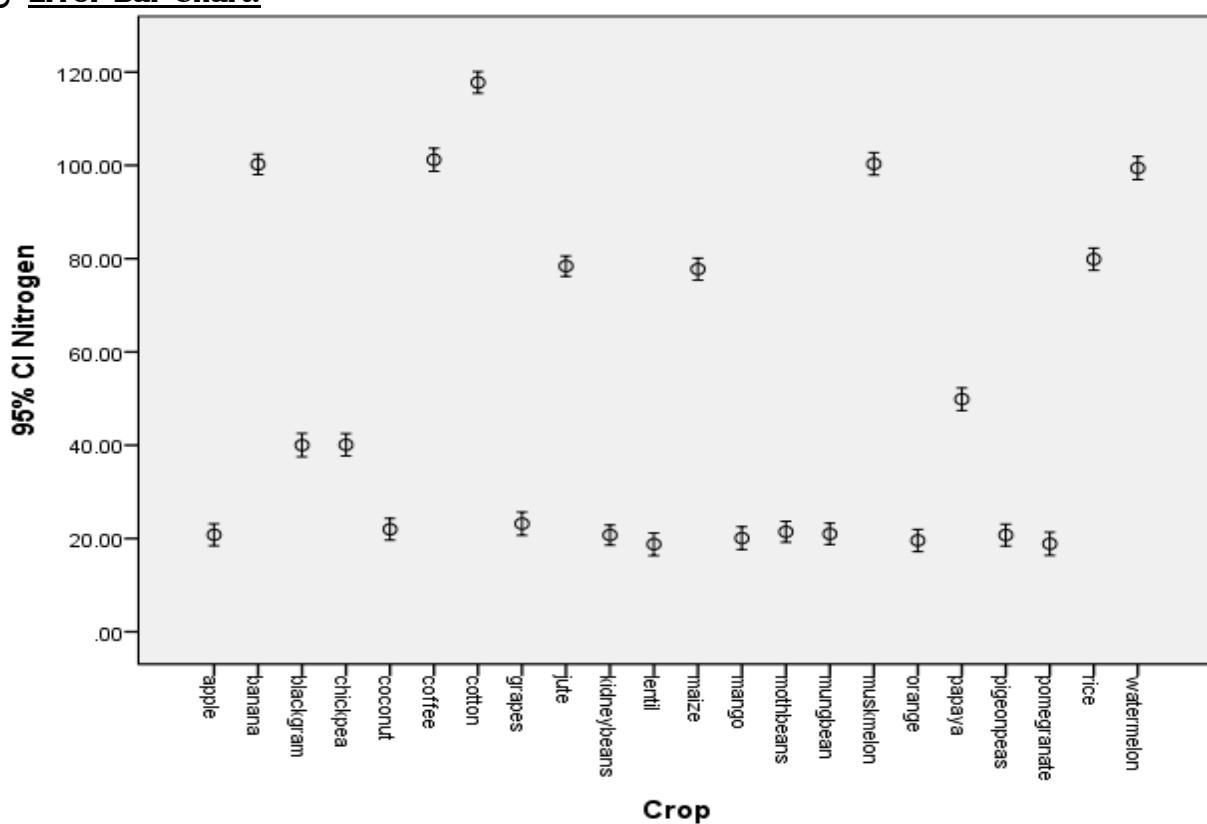


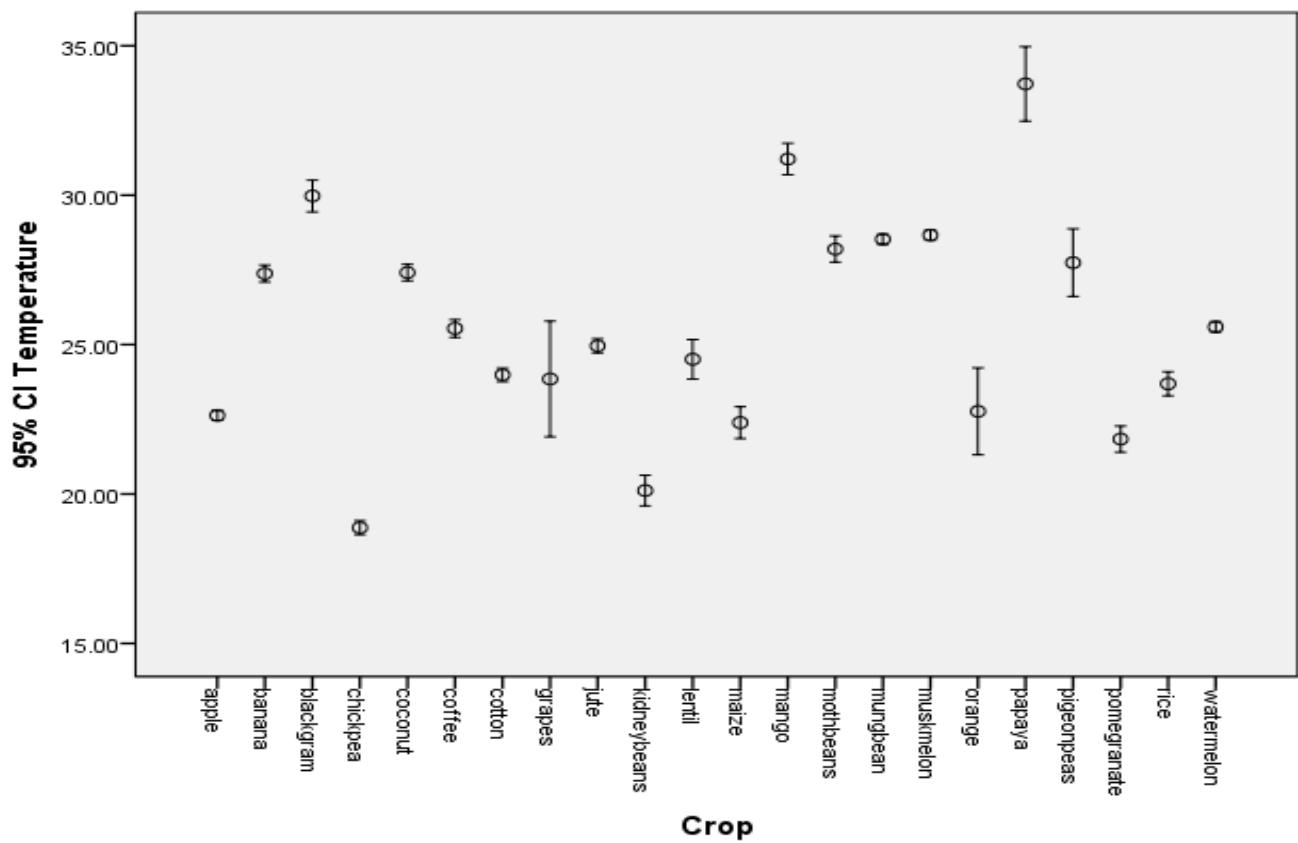
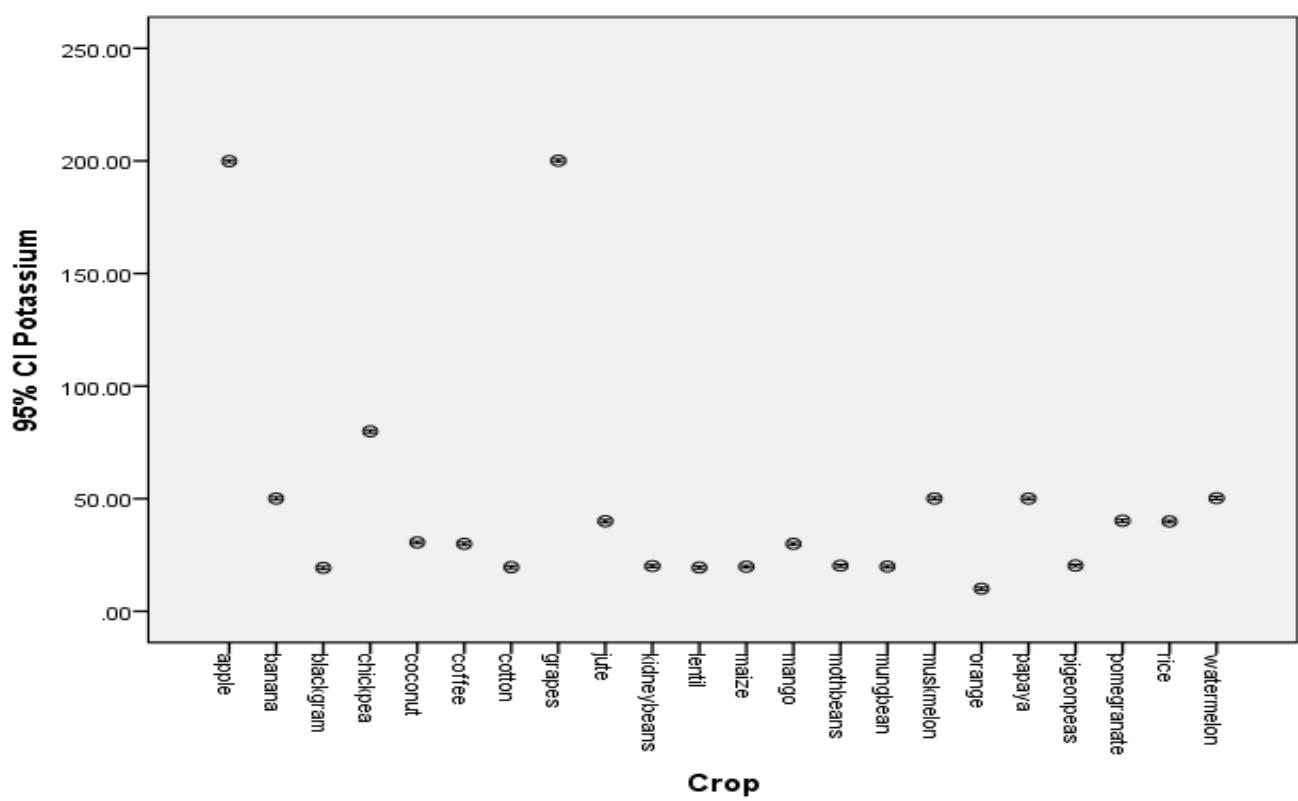


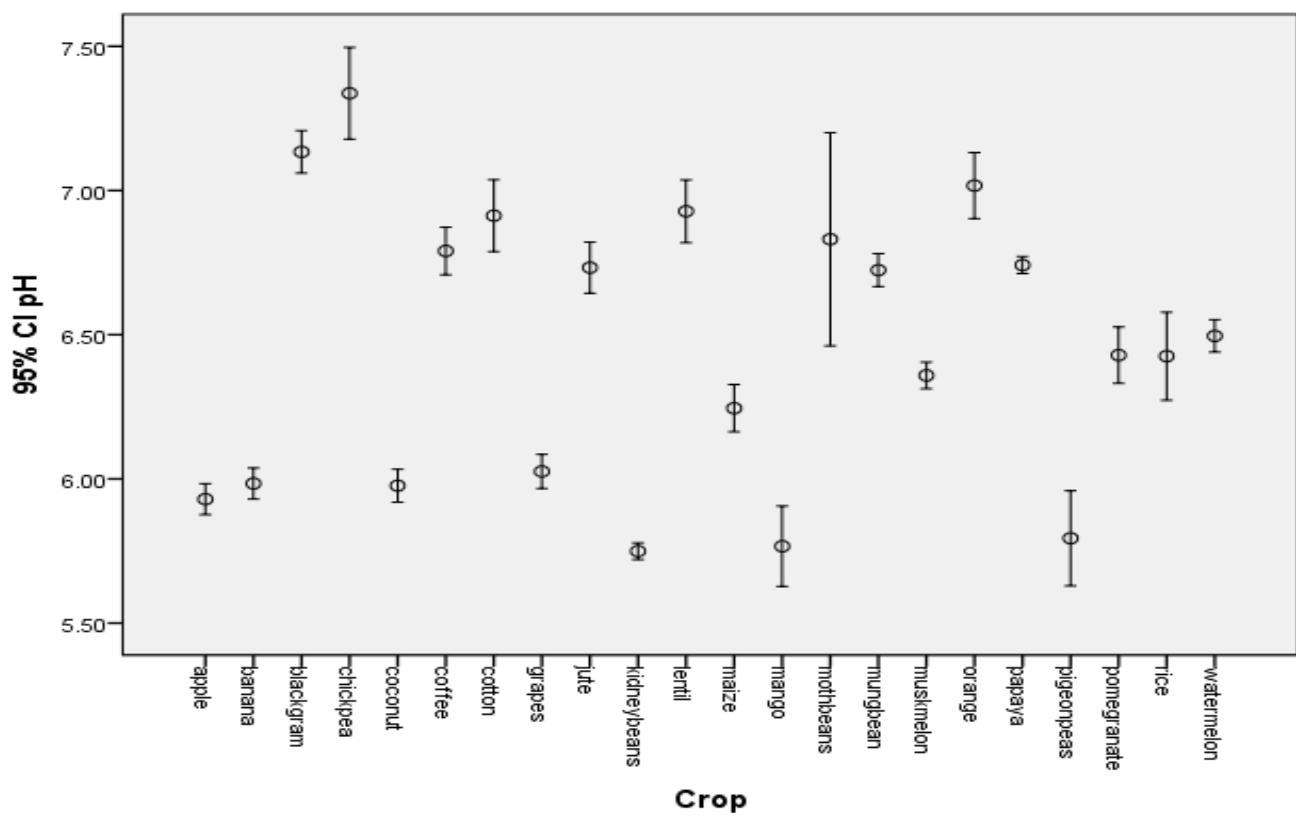
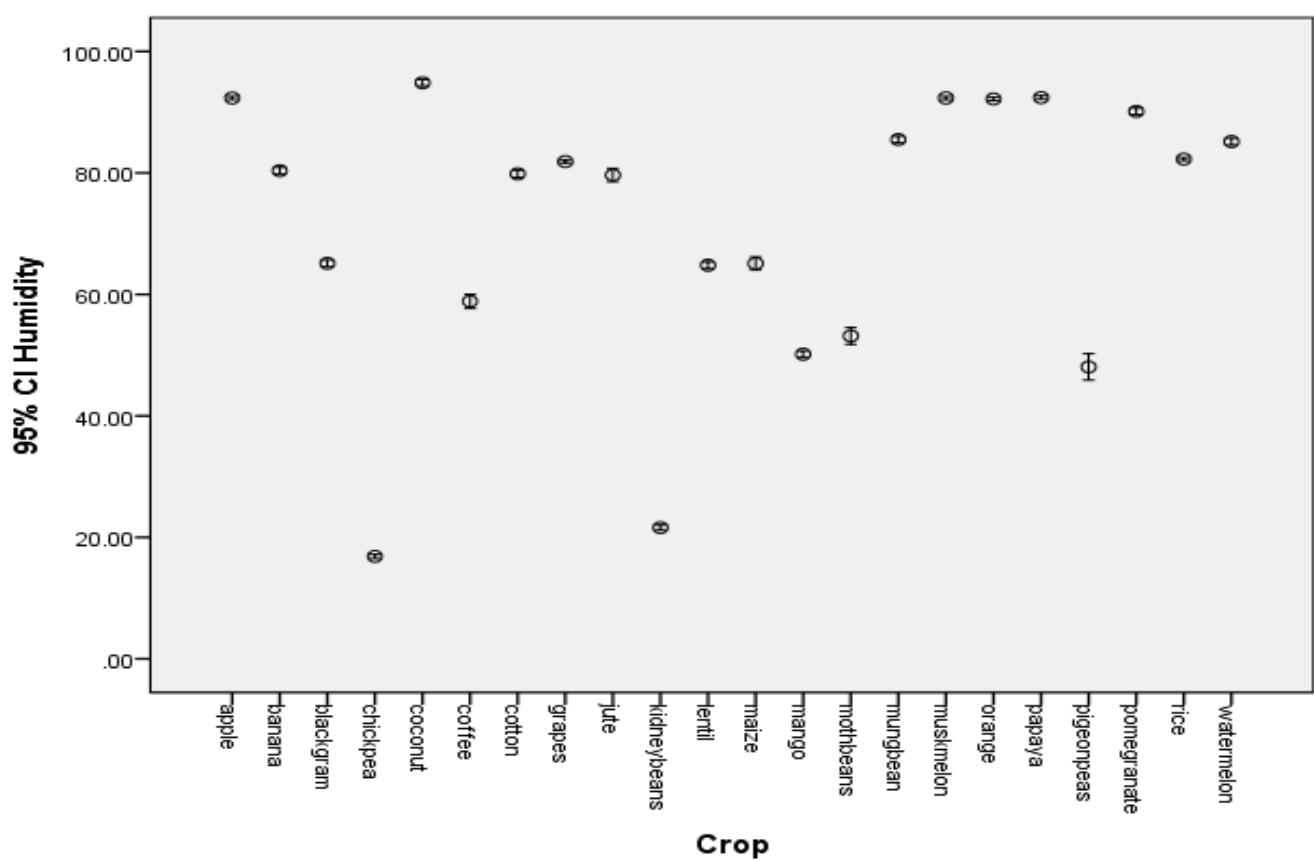


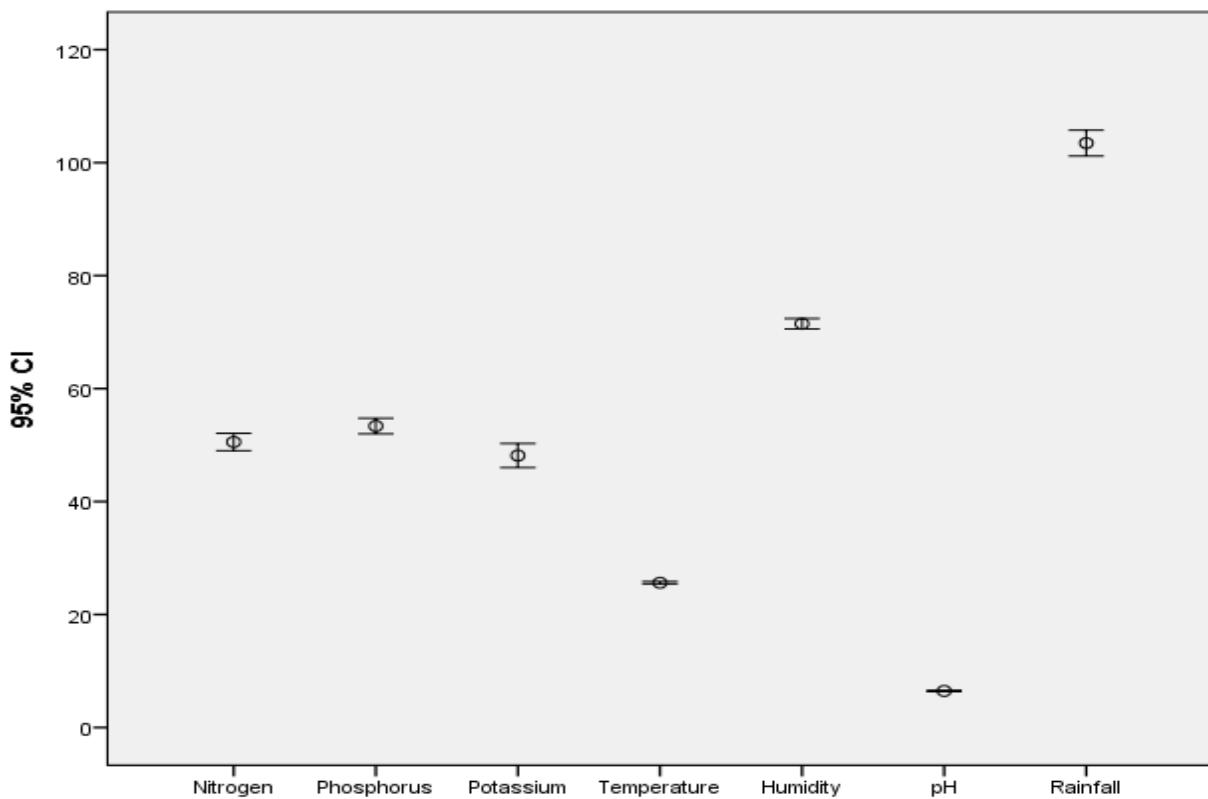
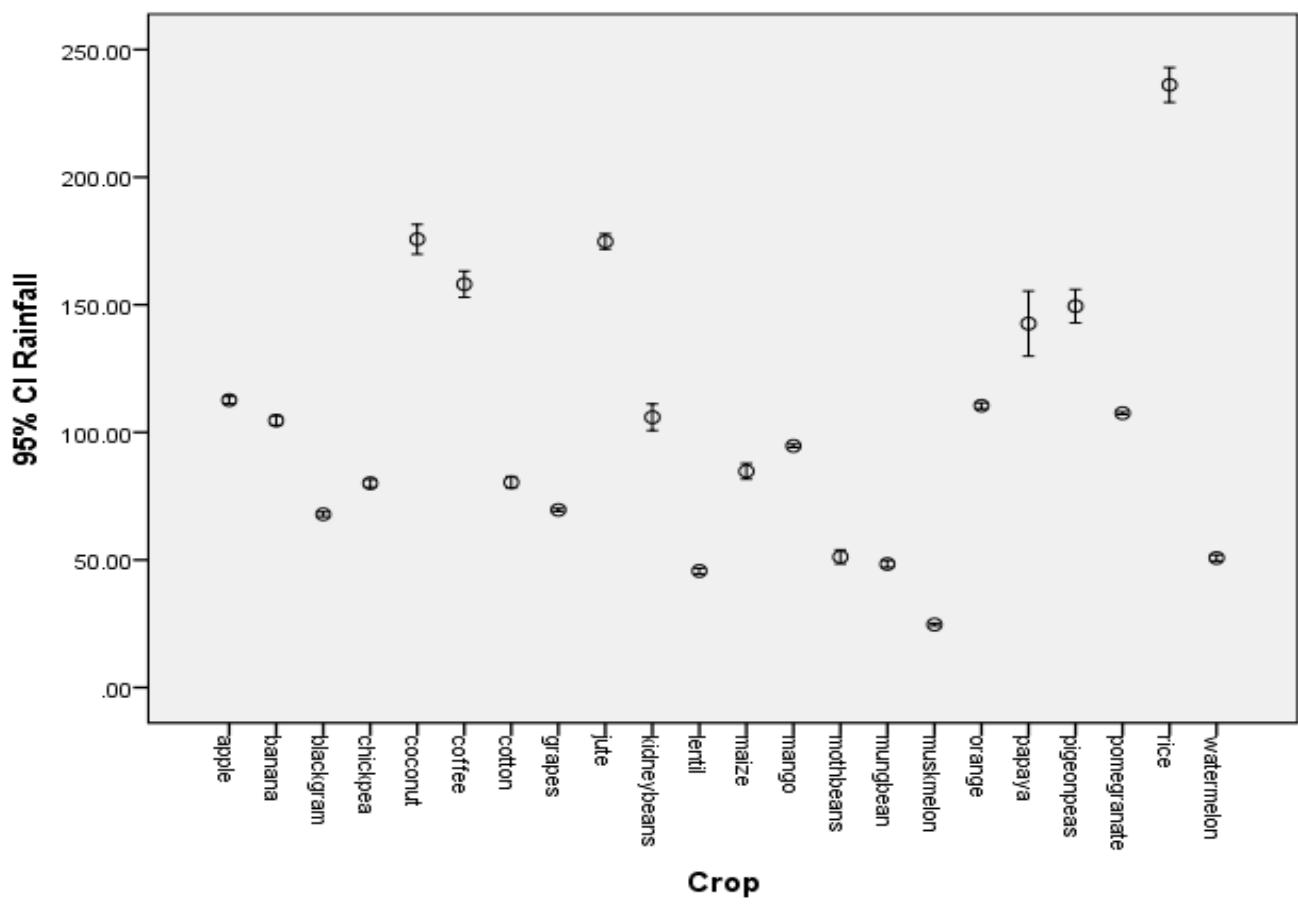


## **Error Bar Chart:**

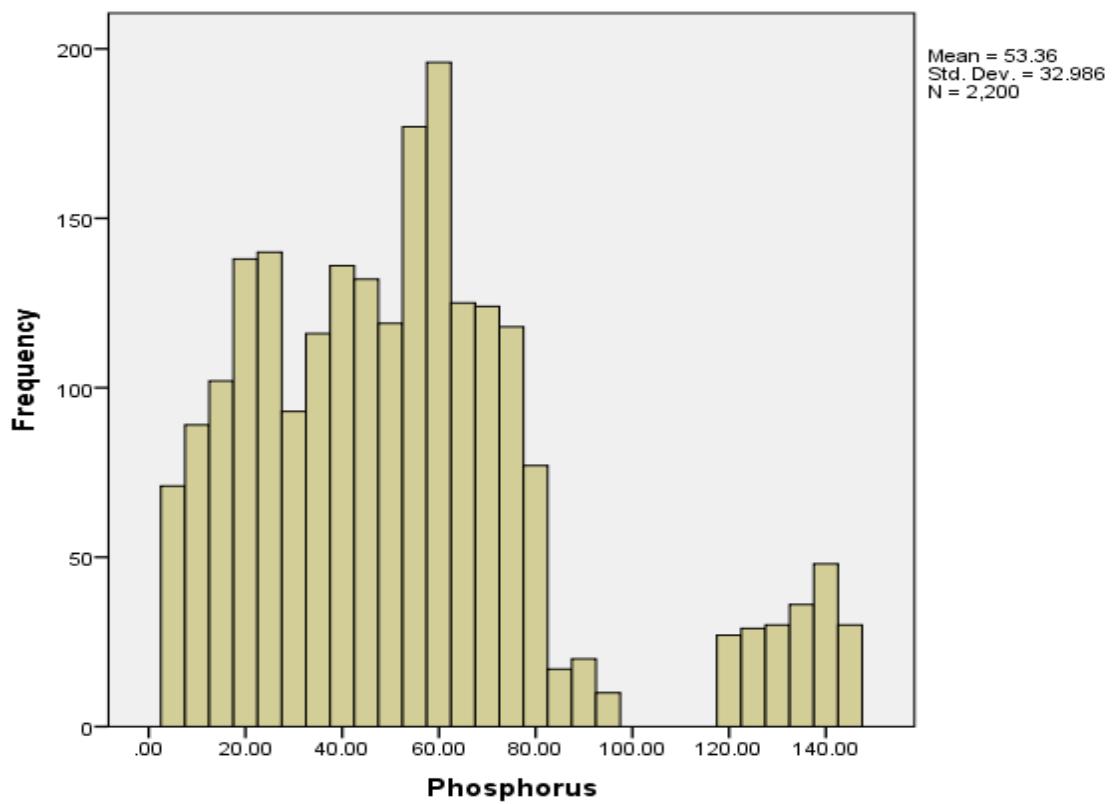
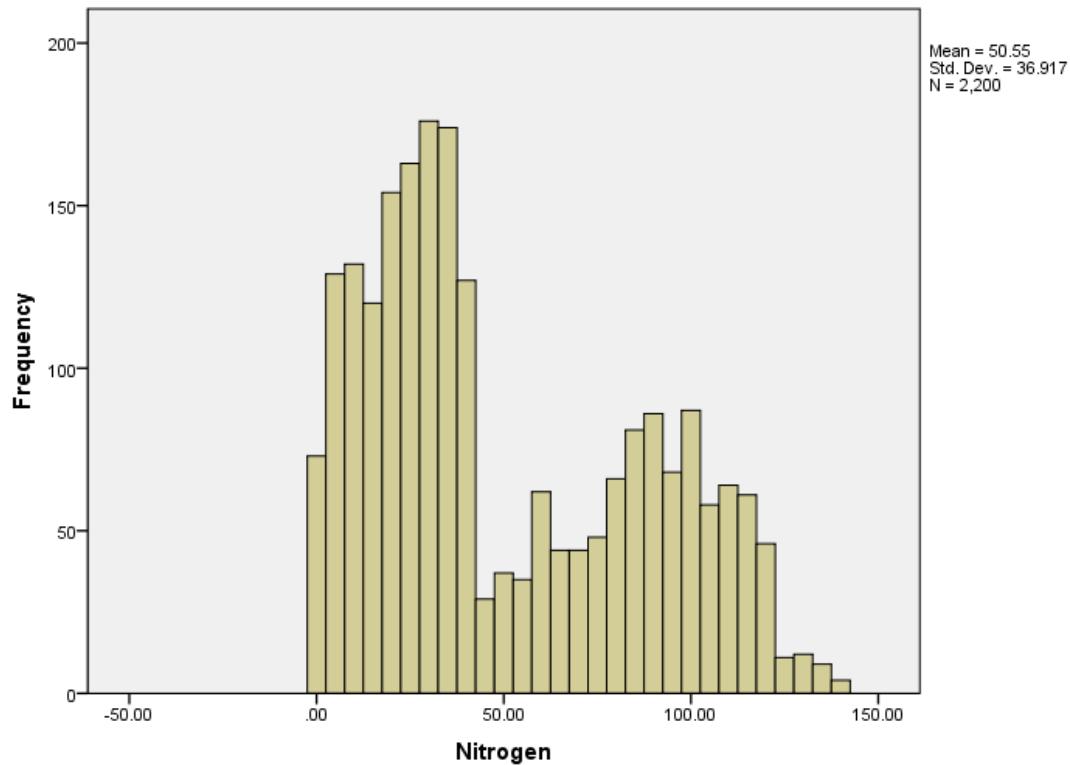


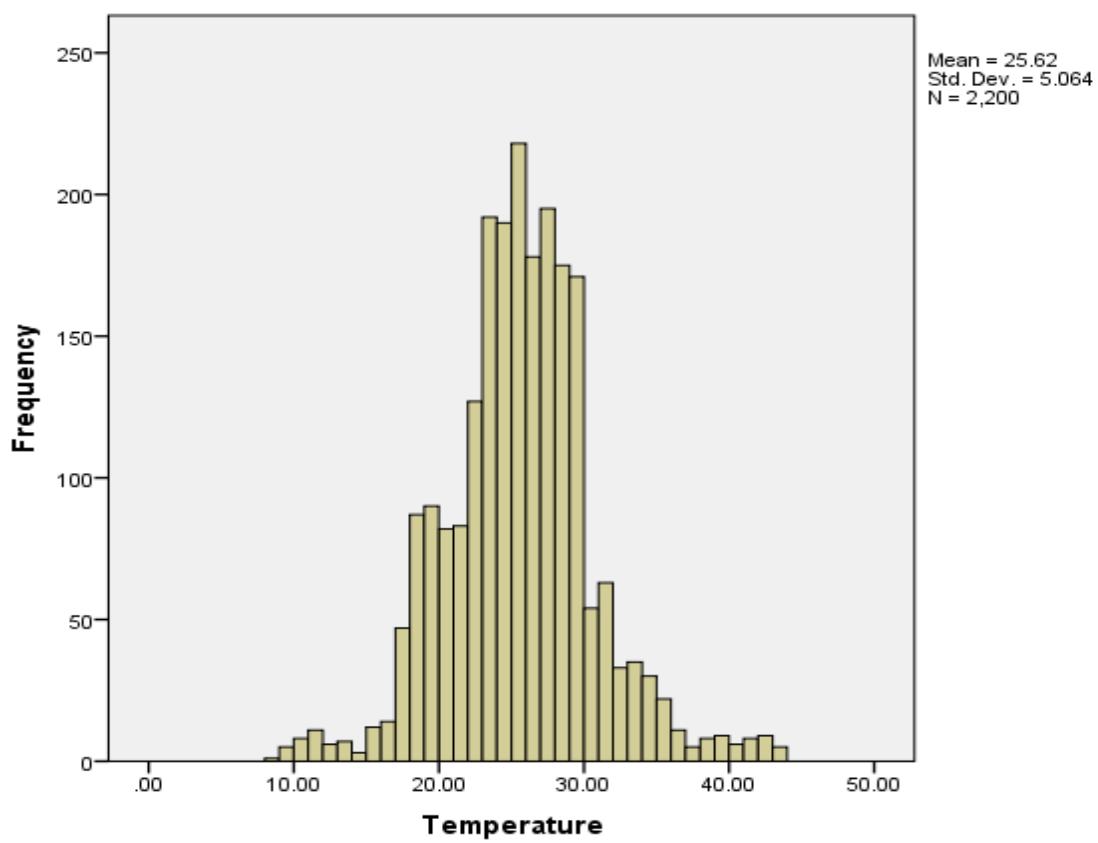
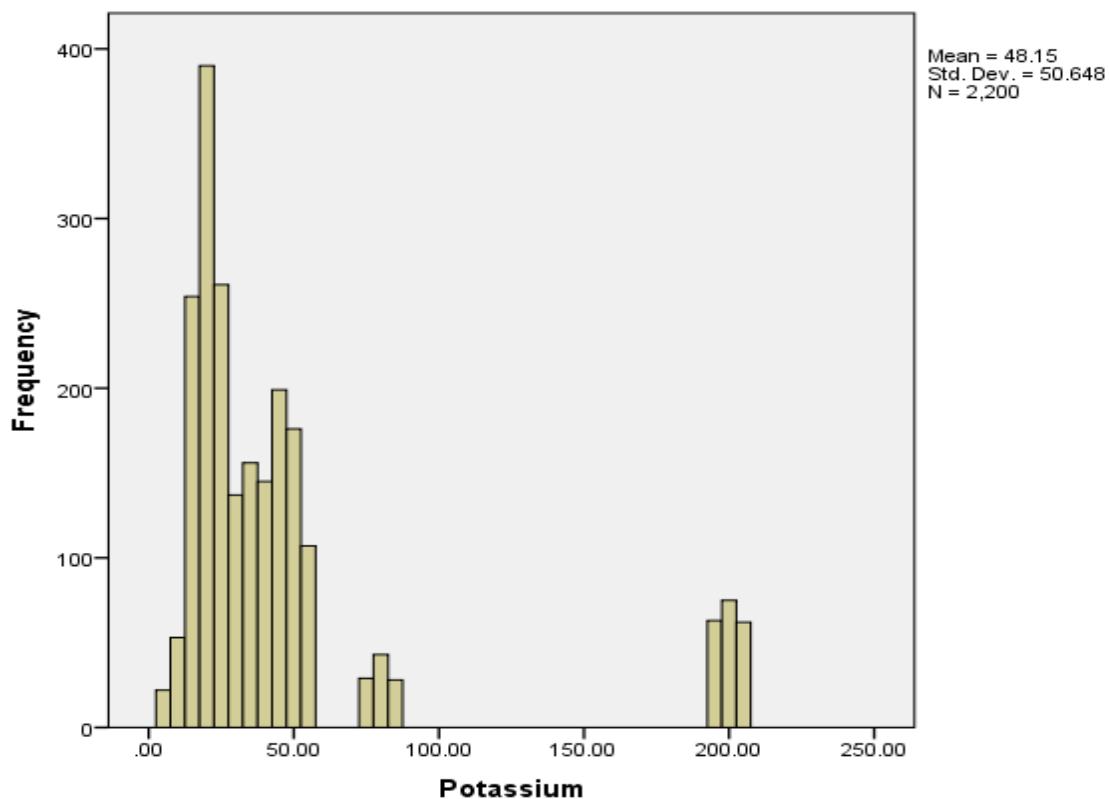


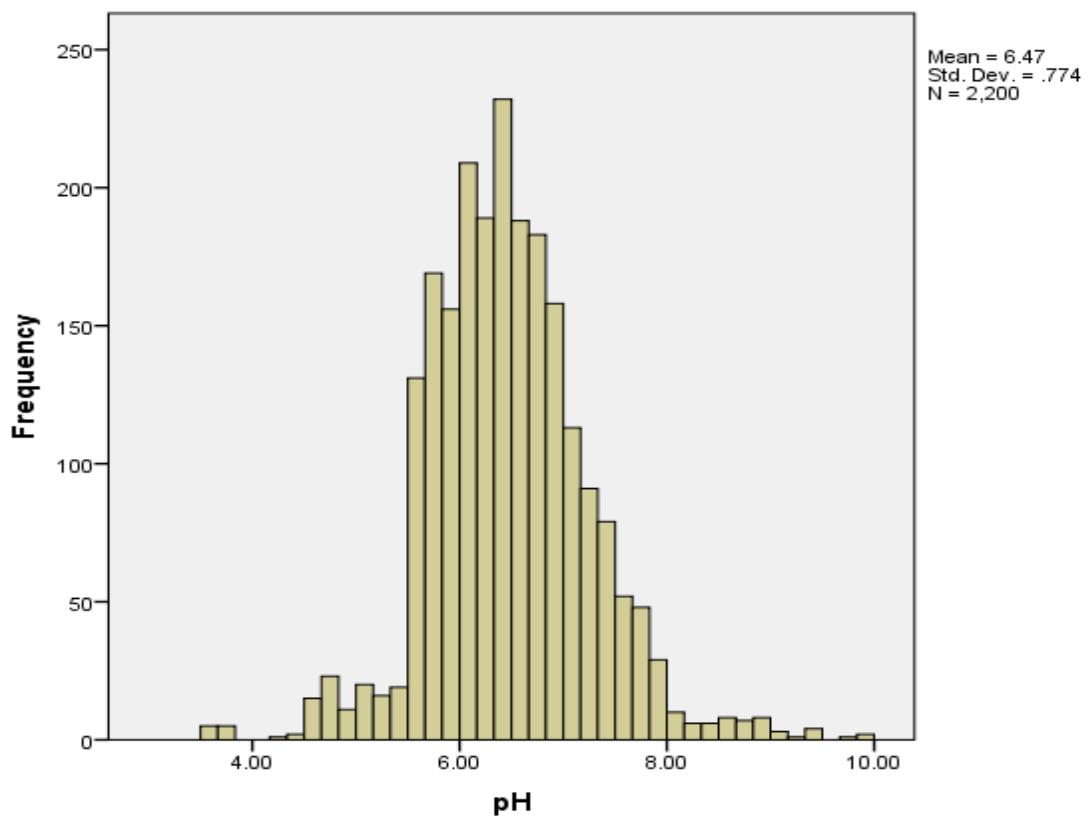
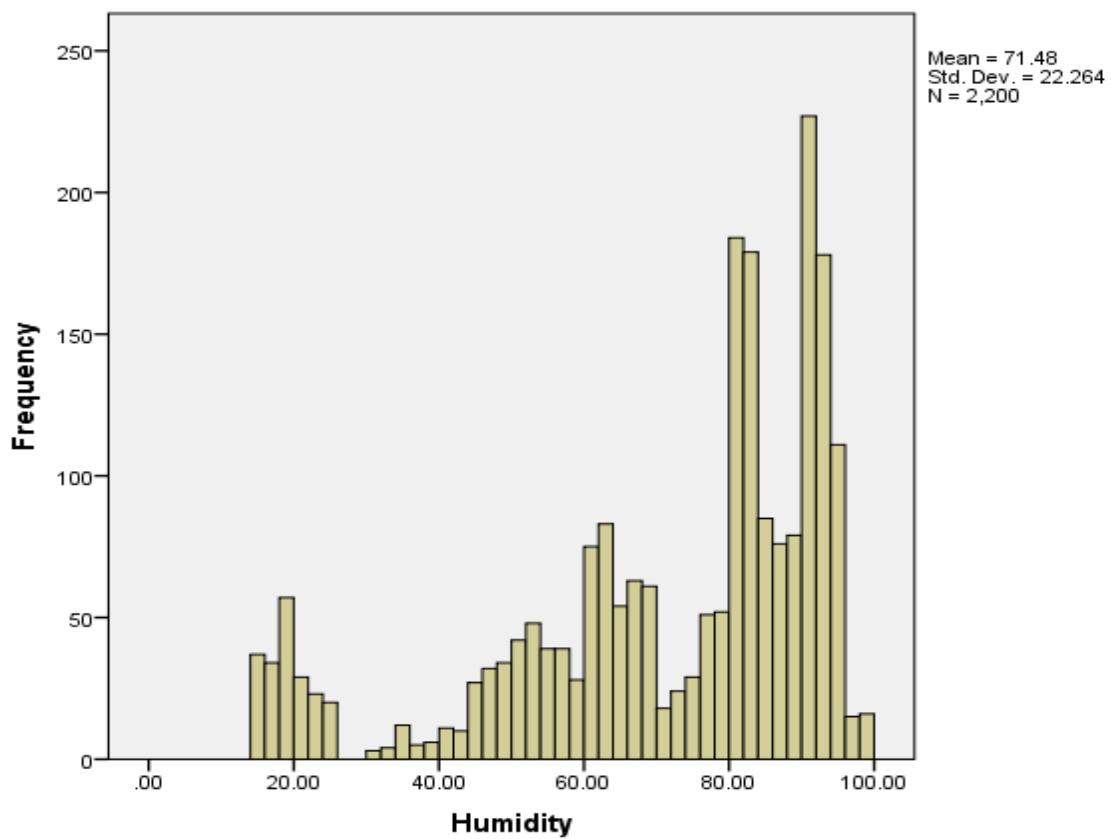


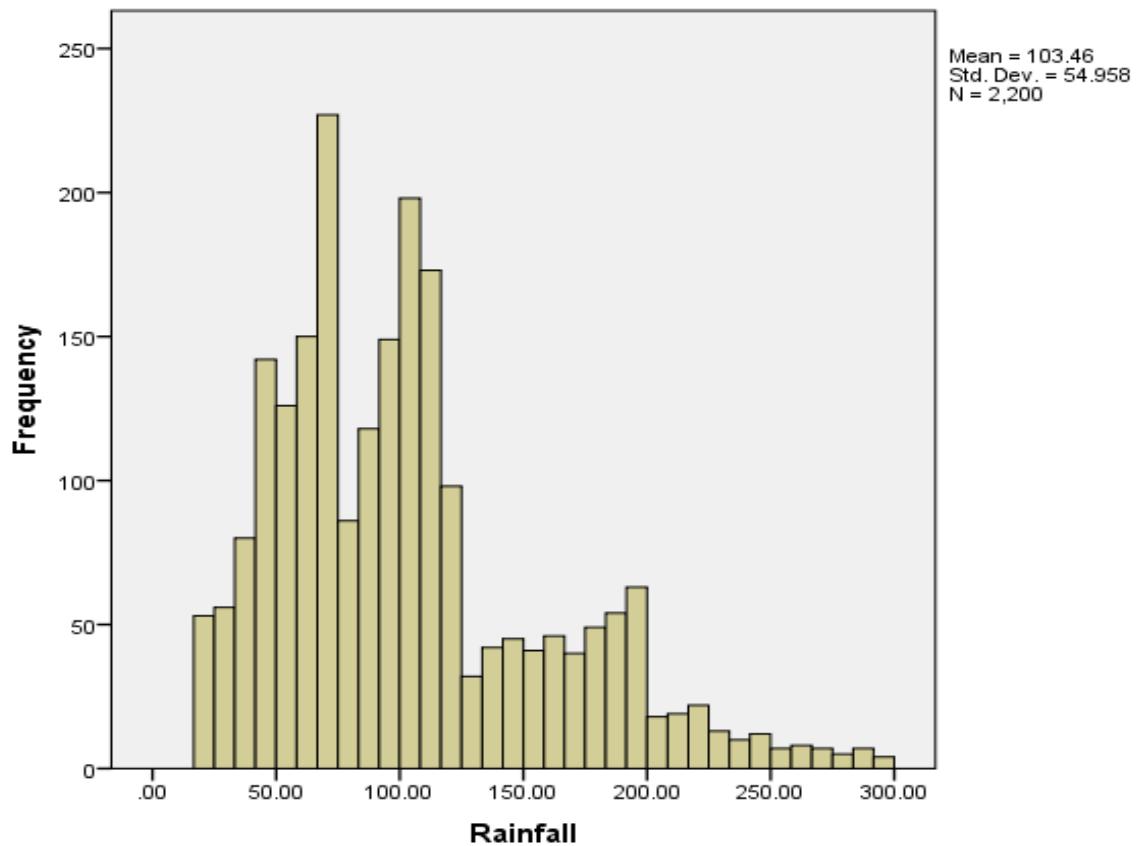


 **Frequency:**  
 **Histogram:**

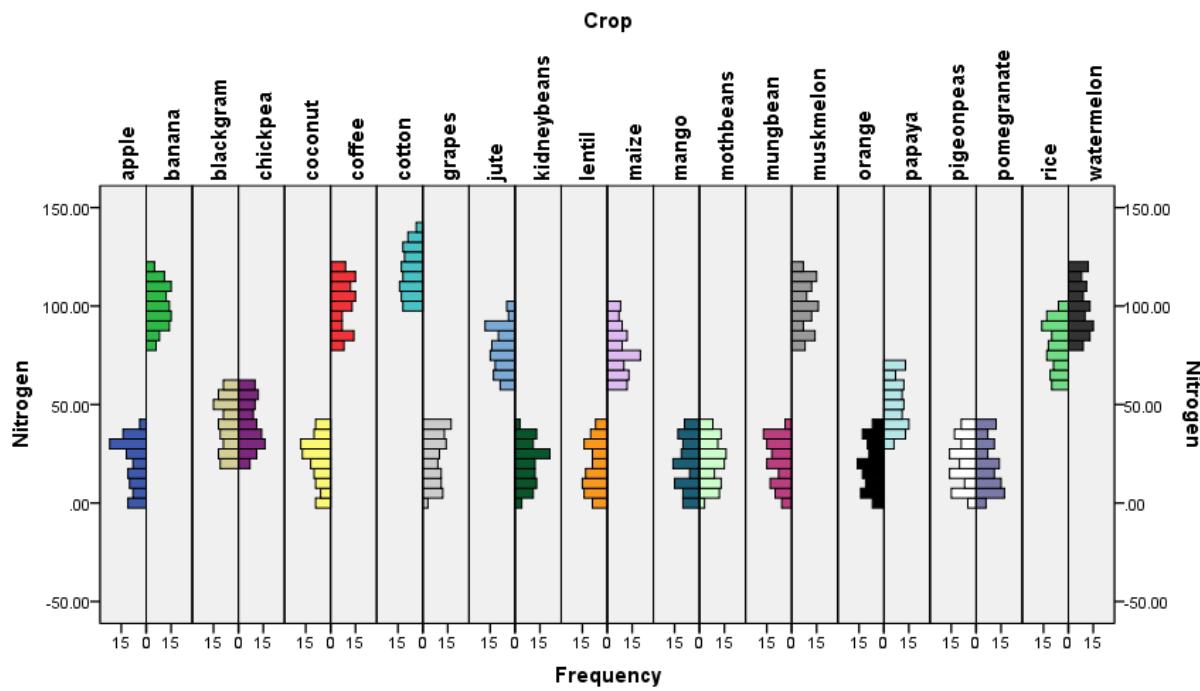


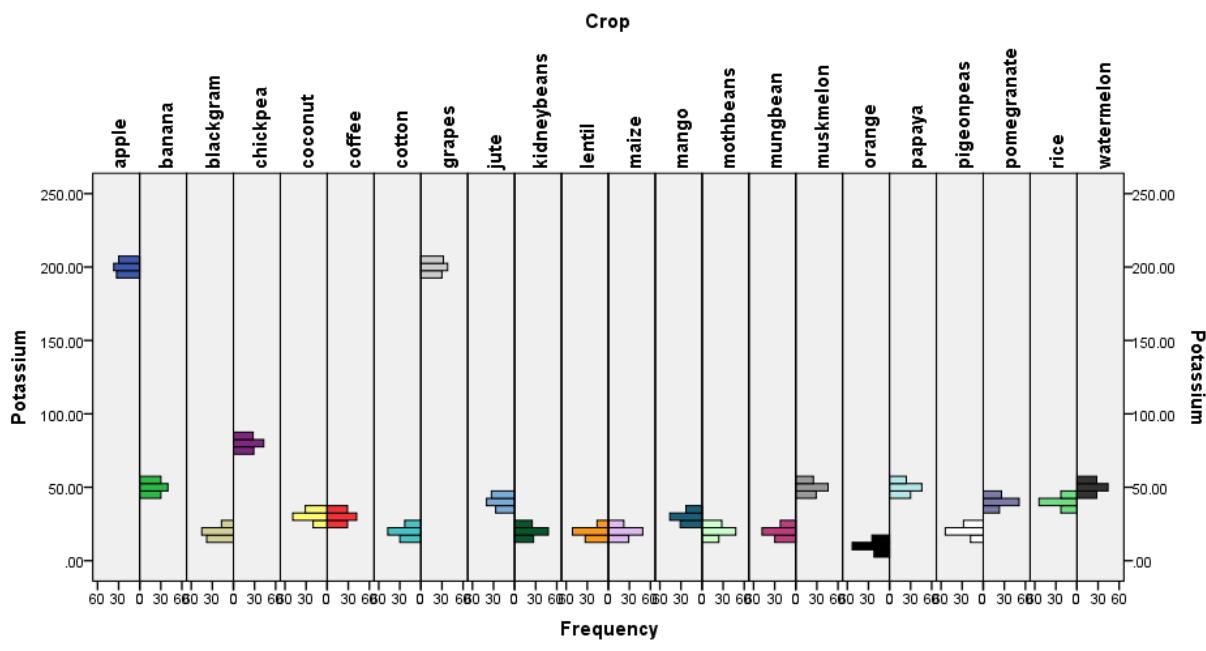
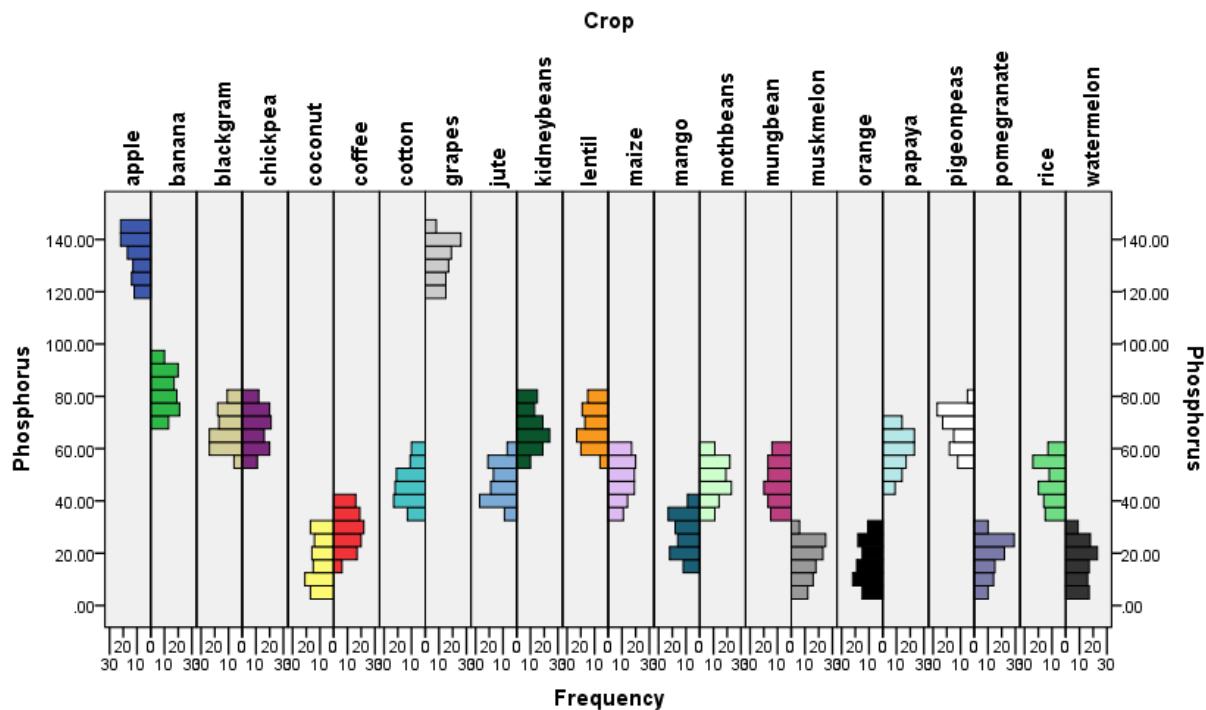


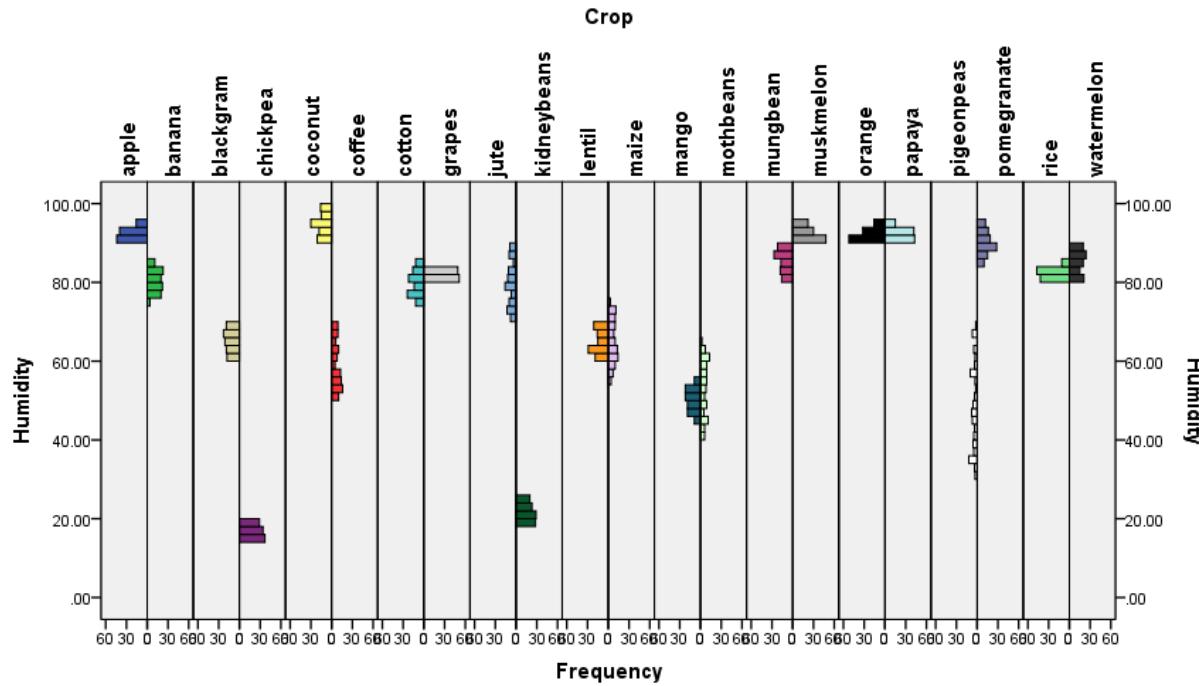
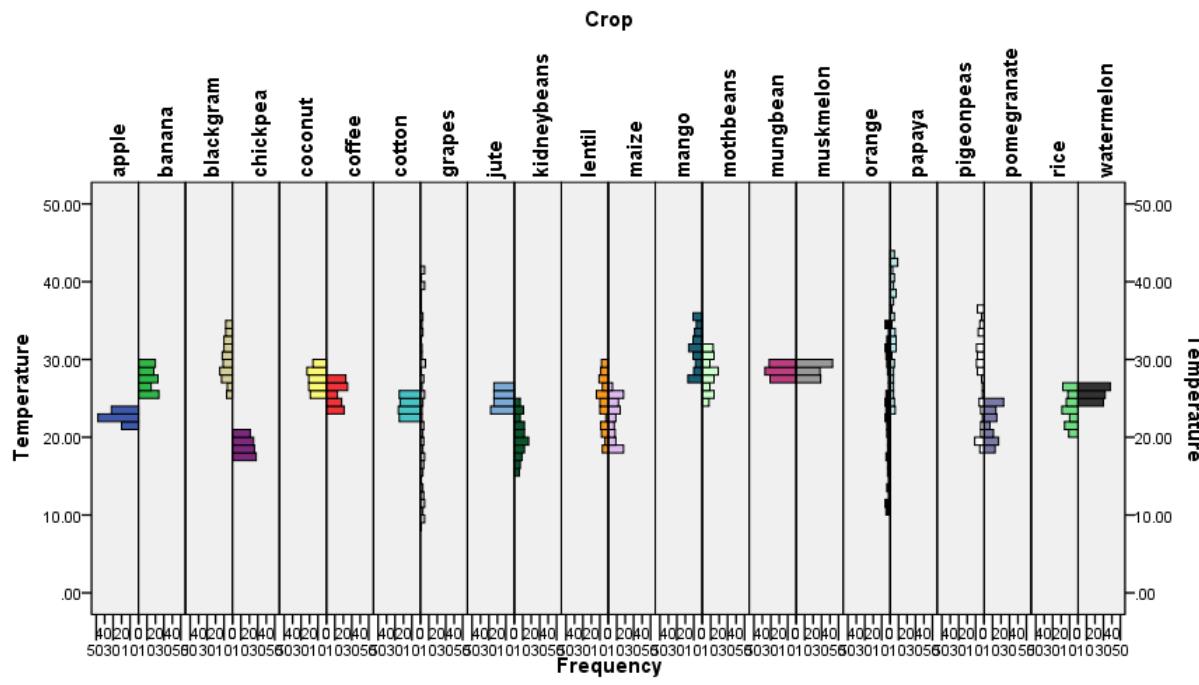


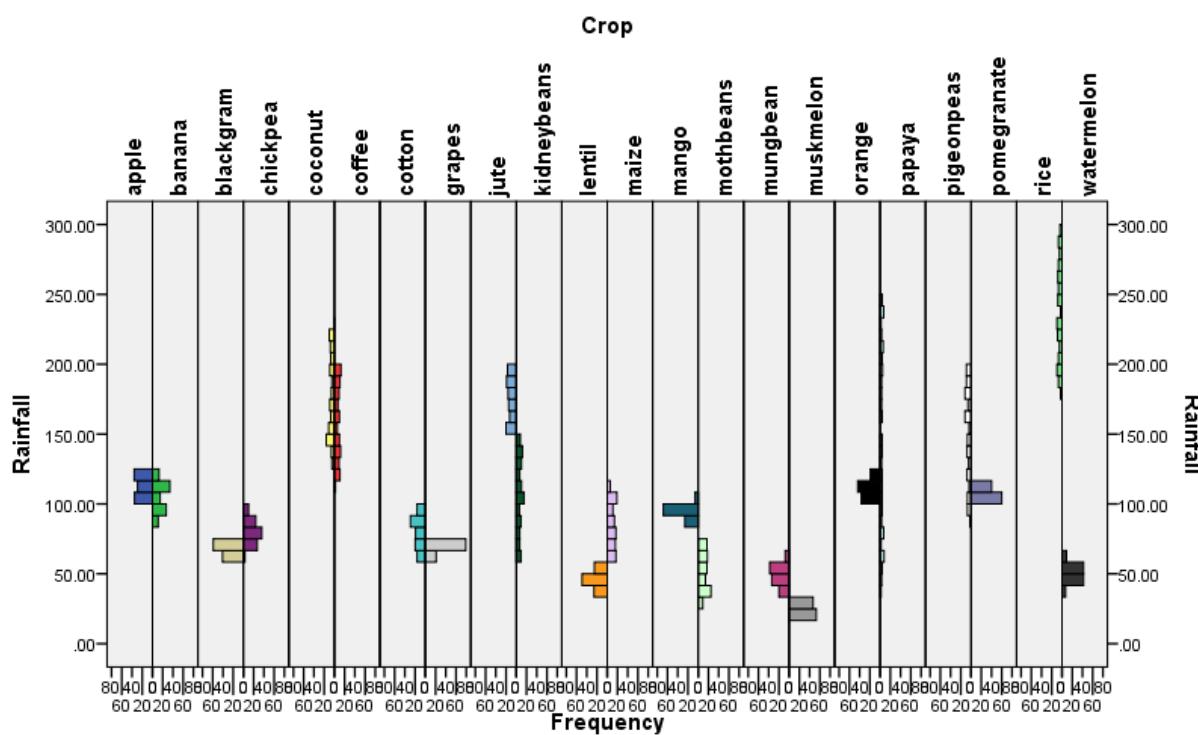
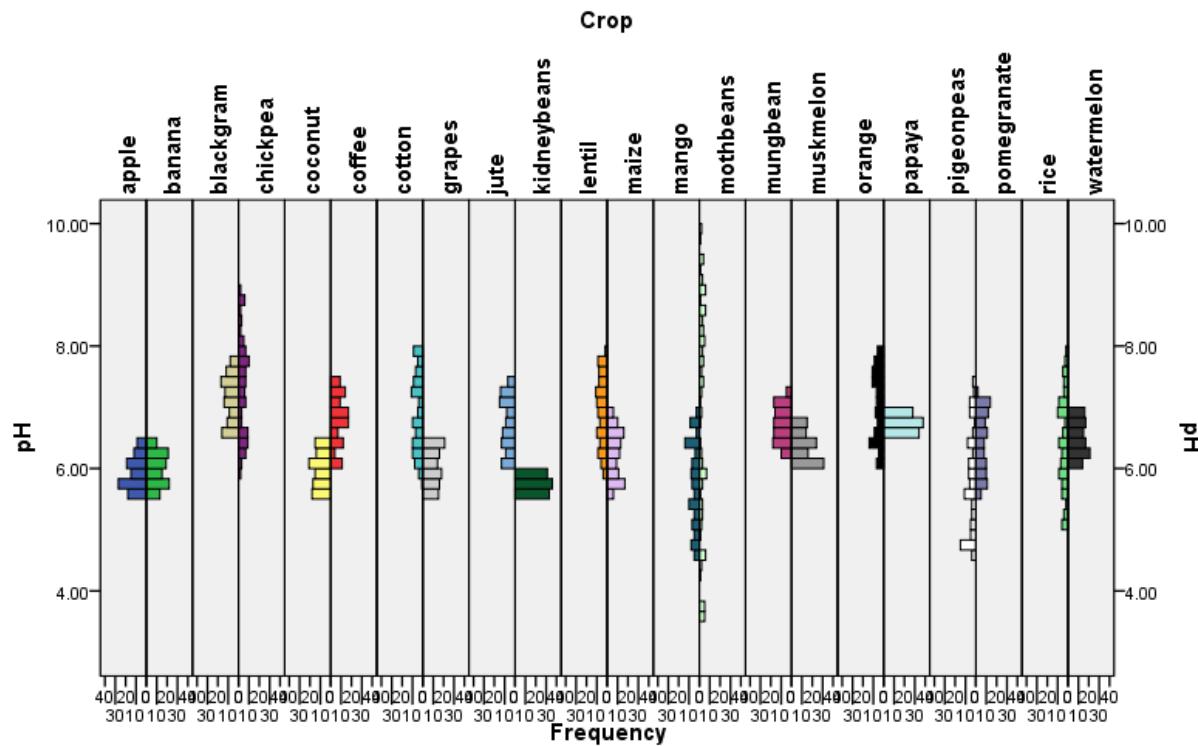


### Population Pyramid:









 **Dot Plot:**

**XGRAPH CHART=[POINT] BY Nitrogen[s]**  
**/DISPLAY DOT=ASYMMETRIC.**

**XGRAPH CHART=[POINT] BY Phosphorus[s]**  
**/DISPLAY DOT=ASYMMETRIC.**

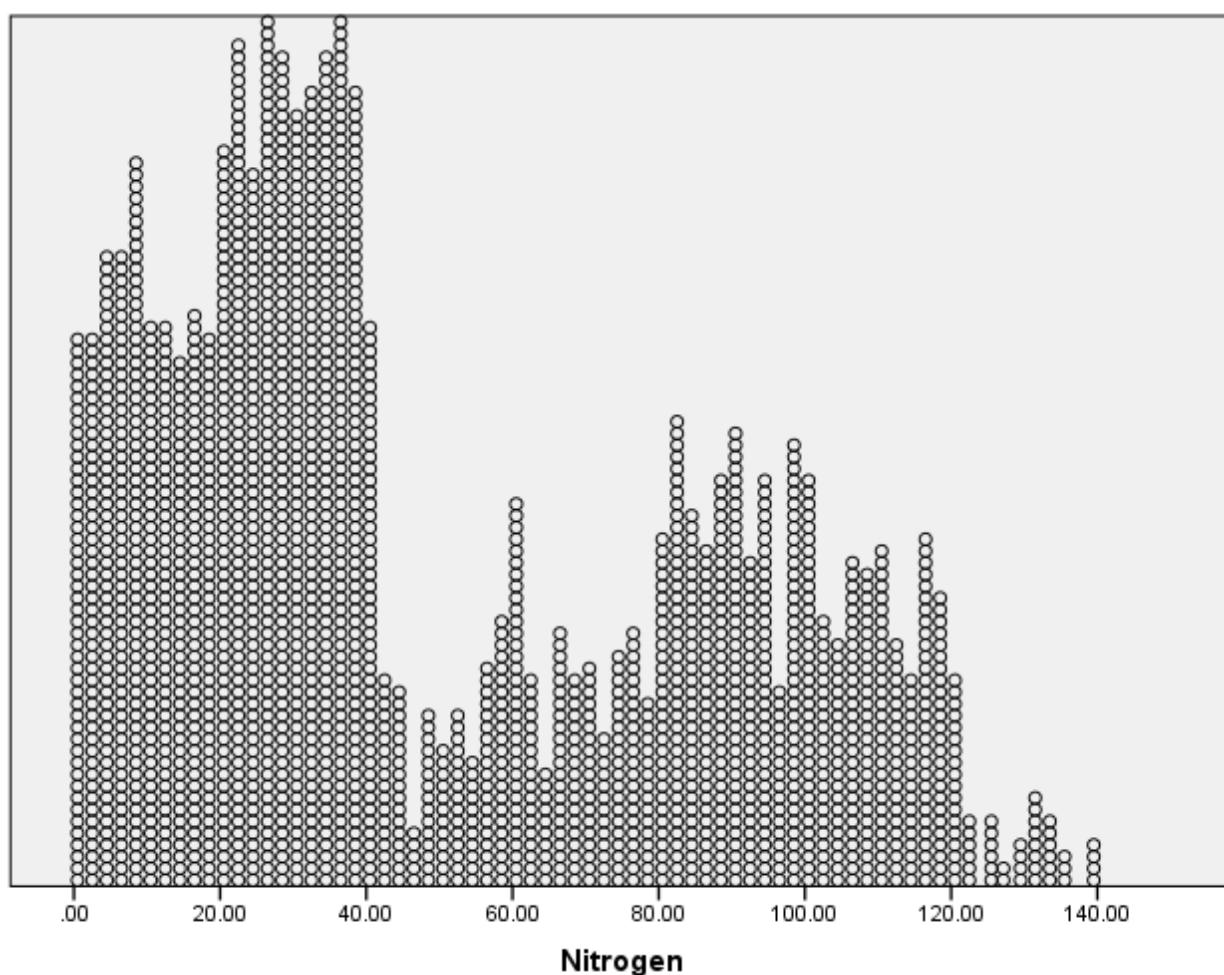
**XGRAPH CHART=[POINT] BY Potassium[s]**  
**/DISPLAY DOT=ASYMMETRIC.**

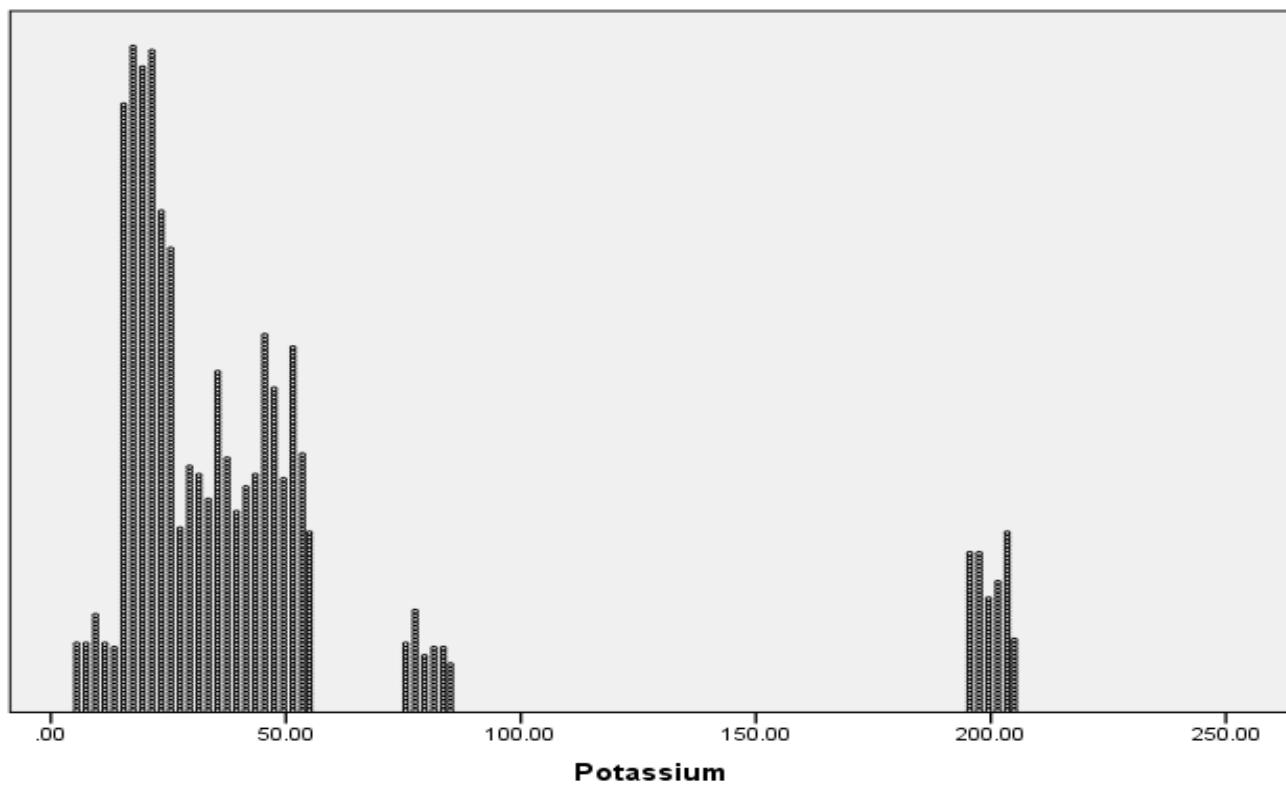
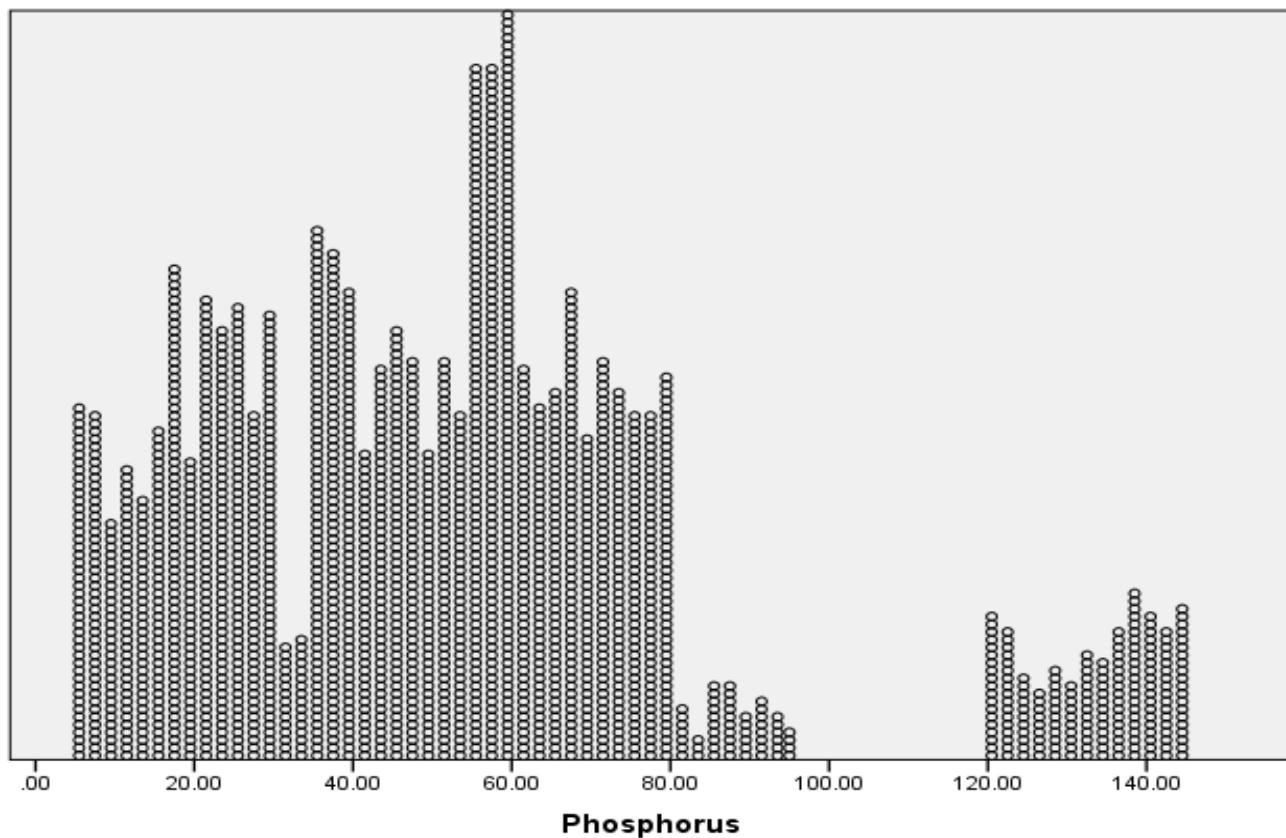
**XGRAPH CHART=[POINT] BY Temperature[s]**  
**/DISPLAY DOT=ASYMMETRIC.**

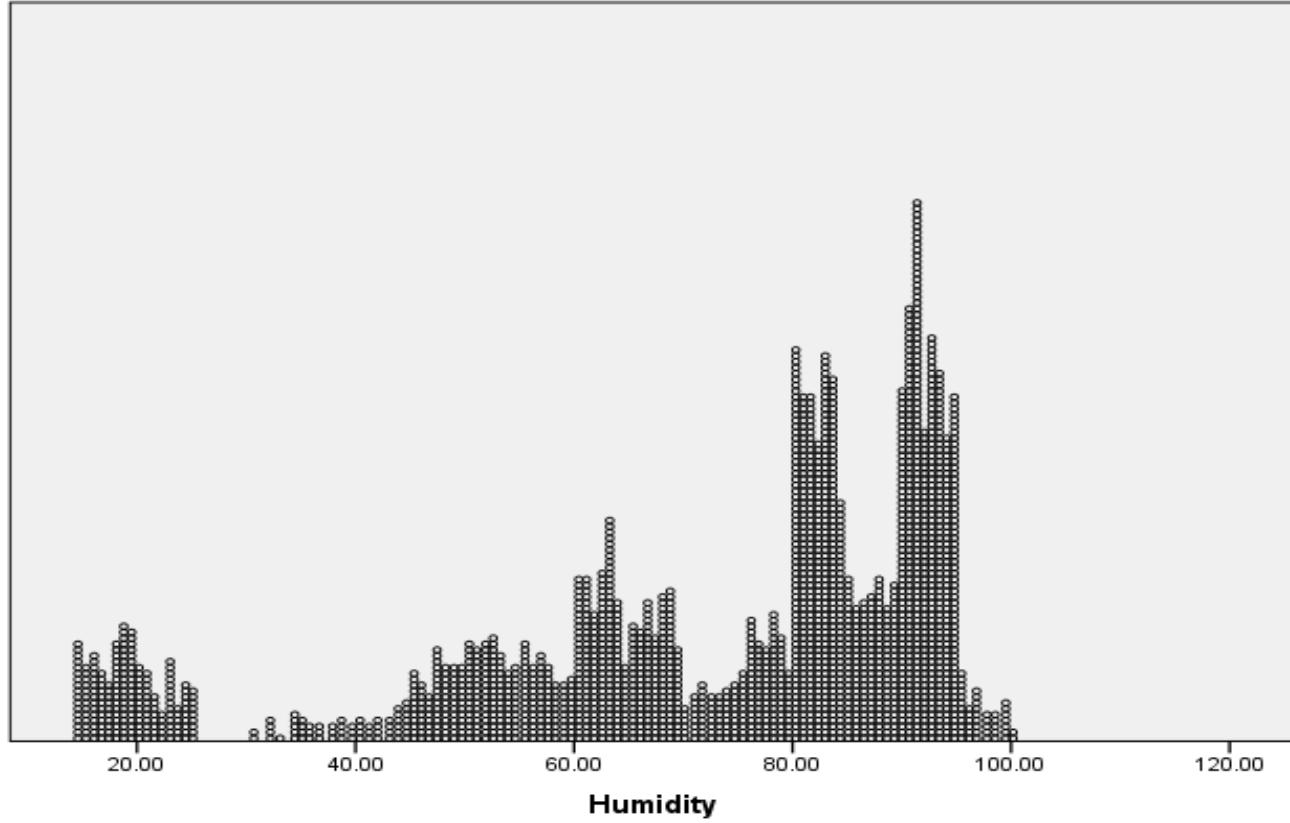
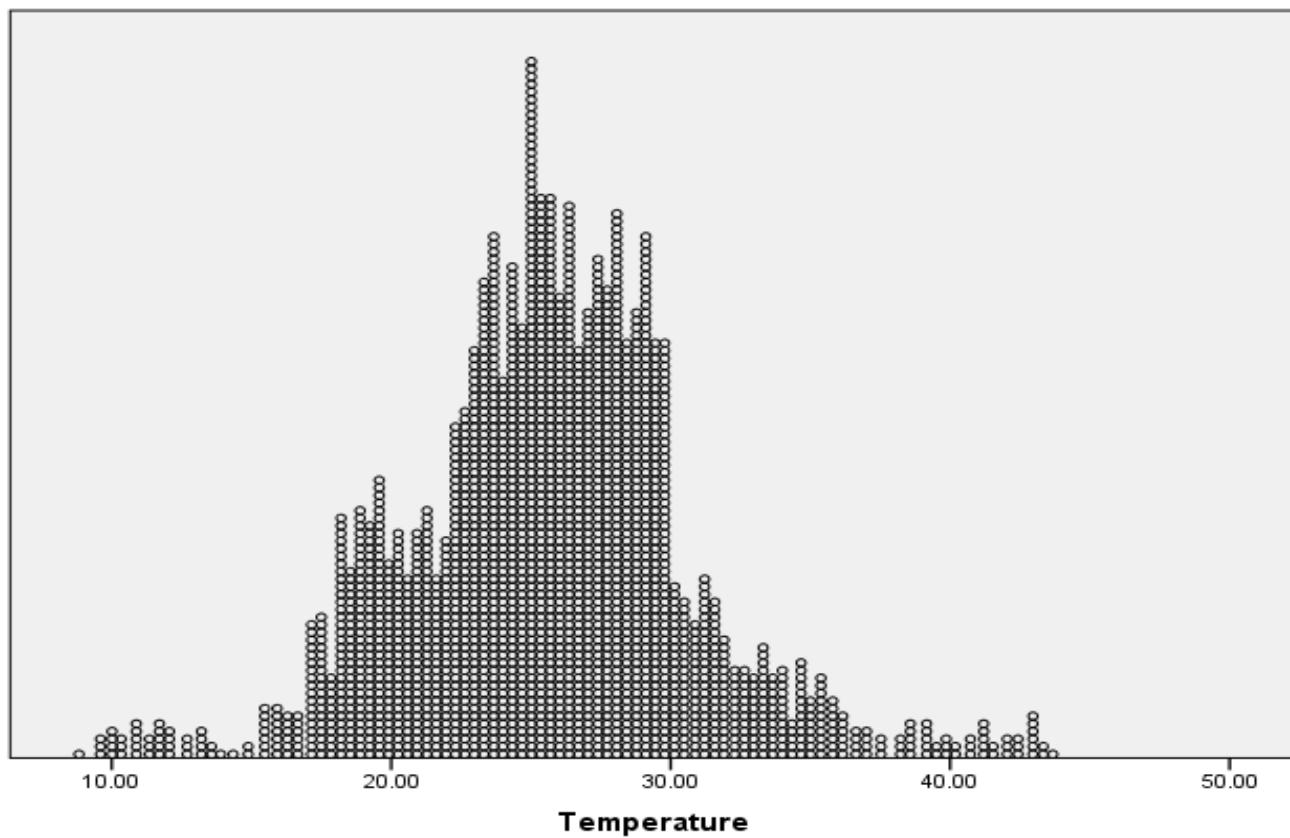
**XGRAPH CHART=[POINT] BY Humidity[s]**  
**/DISPLAY DOT=ASYMMETRIC.**

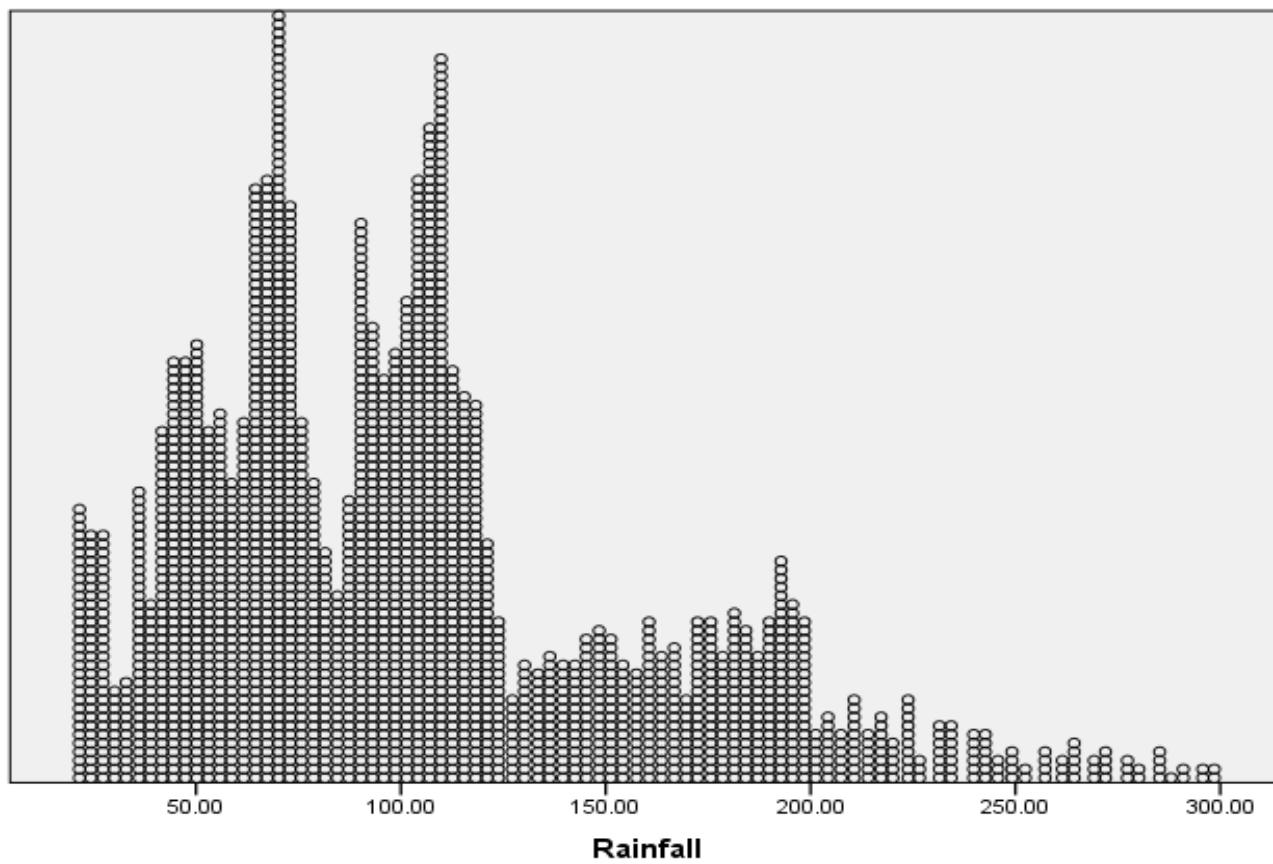
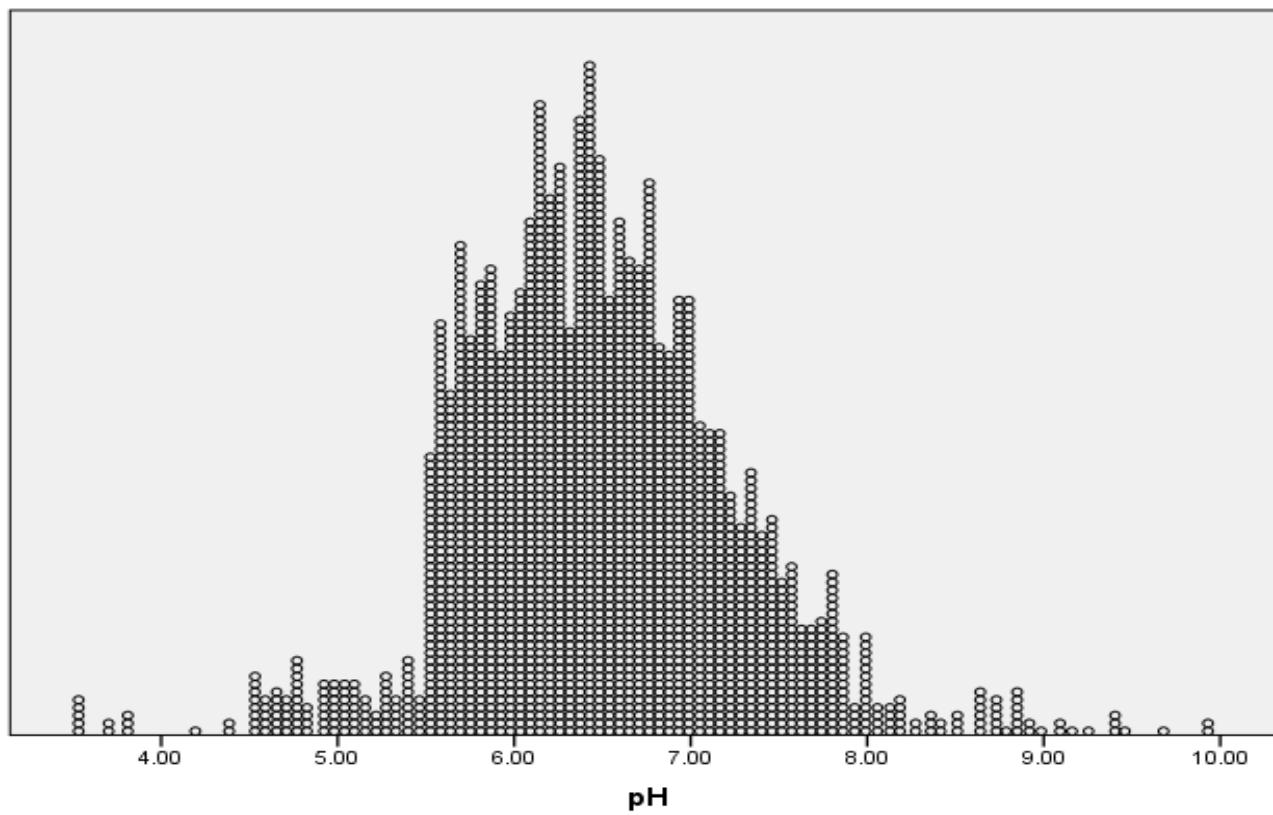
**XGRAPH CHART=[POINT] BY Rainfall[s]**  
**/DISPLAY DOT=ASYMMETRIC.**

**XGRAPH CHART=[POINT] BY pH[s]**  
**/DISPLAY DOT=ASYMMETRIC.**









**🔗 Correlation(Spearman's rho - 1 tailed Significance test):**

Correlations									
			Nitrogen	Phosphorus	Potassium	Temperature	Humidity	pH	Rainfall
<b>Spearman's rho</b>	<b>Nitrogen</b>	<b>Correlation Coefficient</b>	<b>1.000</b>	<b>-.163**</b>	<b>.208**</b>	<b>.022</b>	<b>.061**</b>	<b>.142**</b>	<b>.011</b>
		<b>Sig. (1-tailed)</b>	<b>.</b>	<b>.000</b>	<b>.000</b>	<b>.147</b>	<b>.002</b>	<b>.000</b>	<b>.296</b>
		<b>N</b>	<b>2200</b>	<b>2200</b>	<b>2200</b>	<b>2200</b>	<b>2200</b>	<b>2200</b>	<b>2200</b>
	<b>Phosphorus</b>	<b>Correlation Coefficient</b>	<b>-.163**</b>	<b>1.000</b>	<b>.195**</b>	<b>-.138**</b>	<b>-.309**</b>	<b>-</b>	<b>-.032</b>
		<b>Sig. (1-tailed)</b>	<b>.000</b>	<b>.</b>	<b>.000</b>	<b>.000</b>	<b>.000</b>	<b>.000</b>	<b>.064</b>
		<b>N</b>	<b>2200</b>	<b>2200</b>	<b>2200</b>	<b>2200</b>	<b>2200</b>	<b>2200</b>	<b>2200</b>
	<b>Potassium</b>	<b>Correlation Coefficient</b>	<b>.208**</b>	<b>.195**</b>	<b>1.000</b>	<b>-.081**</b>	<b>.279**</b>	<b>-</b>	<b>.070**</b>
		<b>Sig. (1-tailed)</b>	<b>.000</b>	<b>.000</b>	<b>.</b>	<b>.000</b>	<b>.000</b>	<b>.000</b>	<b>.001</b>
		<b>N</b>	<b>2200</b>	<b>2200</b>	<b>2200</b>	<b>2200</b>	<b>2200</b>	<b>2200</b>	<b>2200</b>
	<b>Temperature</b>	<b>Correlation Coefficient</b>	<b>.022</b>	<b>-.138**</b>	<b>-.081**</b>	<b>1.000</b>	<b>.124**</b>	<b>.028</b>	<b>-.152**</b>
		<b>Sig. (1-tailed)</b>	<b>.147</b>	<b>.000</b>	<b>.000</b>	<b>.</b>	<b>.000</b>	<b>.097</b>	<b>.000</b>
		<b>N</b>	<b>2200</b>	<b>2200</b>	<b>2200</b>	<b>2200</b>	<b>2200</b>	<b>2200</b>	<b>2200</b>
	<b>Humidity</b>	<b>Correlation Coefficient</b>	<b>.061**</b>	<b>-.309**</b>	<b>.279**</b>	<b>.124**</b>	<b>1.000</b>	<b>-.007</b>	<b>.101**</b>
		<b>Sig. (1-tailed)</b>	<b>.002</b>	<b>.000</b>	<b>.000</b>	<b>.000</b>	<b>.</b>	<b>.366</b>	<b>.000</b>
		<b>N</b>	<b>2200</b>	<b>2200</b>	<b>2200</b>	<b>2200</b>	<b>2200</b>	<b>2200</b>	<b>2200</b>
	<b>pH</b>	<b>Correlation Coefficient</b>	<b>.142**</b>	<b>-.119**</b>	<b>-.155**</b>	<b>.028</b>	<b>-.007</b>	<b>1.000</b>	<b>-.151**</b>
		<b>Sig. (1-tailed)</b>	<b>.000</b>	<b>.000</b>	<b>.000</b>	<b>.097</b>	<b>.366</b>	<b>.</b>	<b>.000</b>
		<b>N</b>	<b>2200</b>	<b>2200</b>	<b>2200</b>	<b>2200</b>	<b>2200</b>	<b>2200</b>	<b>2200</b>
	<b>Rainfall</b>	<b>Correlation Coefficient</b>	<b>.011</b>	<b>-.032</b>	<b>.070**</b>	<b>-.152**</b>	<b>.101**</b>	<b>-</b>	<b>1.000</b>
		<b>Sig. (1-tailed)</b>	<b>.296</b>	<b>.064</b>	<b>.001</b>	<b>.000</b>	<b>.000</b>	<b>.000</b>	<b>.</b>
		<b>N</b>	<b>2200</b>	<b>2200</b>	<b>2200</b>	<b>2200</b>	<b>2200</b>	<b>2200</b>	<b>2200</b>

\*\*. Correlation is significant at the 0.01 level (1-tailed).

**🔗 Correlation(Spearman's rho - 2 tailed Significance test):**

Correlations									
			Nitrogen	Phosphorus	Potassium	Temperature	Humidity	pH	Rainfall
Spearman's rho	Nitrogen	Correlation Coefficient	<b>1.000</b>	-.163**	.208**	.022	.061**	.142**	.011
		Sig. (2-tailed)	.	.000	.000	.294	.004	.000	.593
		N	<b>2200</b>						
	Phosphorus	Correlation Coefficient	-.163**	<b>1.000</b>	.195**	-.138**	-.309**	-.119**	-.032
		Sig. (2-tailed)	.000	.	.000	.000	.000	.000	.128
		N	<b>2200</b>						
	Potassium	Correlation Coefficient	.208**	.195**	<b>1.000</b>	-.081**	.279**	-.155**	.070**
		Sig. (2-tailed)	.000	.000	.	.000	.000	.000	.001
		N	<b>2200</b>						
	Temperature	Correlation Coefficient	.022	-.138**	-.081**	<b>1.000</b>	.124**	.028	-.152**
		Sig. (2-tailed)	.294	.000	.000	.	.000	.193	.000
		N	<b>2200</b>						
	Humidity	Correlation Coefficient	.061**	-.309**	.279**	.124**	<b>1.000</b>	-.007	.101**
		Sig. (2-tailed)	.004	.000	.000	.000	.	.733	.000
		N	<b>2200</b>						
	pH	Correlation Coefficient	.142**	-.119**	-.155**	.028	-.007	<b>1.000</b>	-.151**
		Sig. (2-tailed)	.000	.000	.000	.193	.733	.	.000
		N	<b>2200</b>						
	Rainfall	Correlation Coefficient	.011	-.032	.070**	-.152**	.101**	-.151**	<b>1.000</b>
		Sig. (2-tailed)	.593	.128	.001	.000	.000	.000	.
		N	<b>2200</b>						

\*\*. Correlation is significant at the 0.01 level (2-tailed).

### ડ Correlation(Kendall's tau-b -1 tailed Significance test):

### **Correlation(Kendall's tau-b -2 tailed Significance test):**

	Correlations						
	Nitrogen	Phosphorus	Potassium	Temperature	Humidity	pH	Rainfall
	0.85	0.78	0.82	0.65	0.72	0.58	0.88

<b>Kendall's tau-b</b>	<b>Nitrogen</b>	<b>Correlation Coefficient</b>	<b>1.000</b>	<b>-.126**</b>	<b>.134**</b>	<b>.018</b>	<b>.044**</b>	<b>.090**</b>	<b>.011</b>
		<b>Sig. (2-tailed)</b>	<b>.</b>	<b>.000</b>	<b>.000</b>	<b>.208</b>	<b>.002</b>	<b>.000</b>	<b>.455</b>
		<b>N</b>	<b>2200</b>						
<b>Phosphorus</b>	<b>Phosphorus</b>	<b>Correlation Coefficient</b>	<b>-.126**</b>	<b>1.000</b>	<b>.113**</b>	<b>-.094**</b>	<b>-.209**</b>	<b>-.070**</b>	<b>-.018</b>
		<b>Sig. (2-tailed)</b>	<b>.000</b>	<b>.</b>	<b>.000</b>	<b>.000</b>	<b>.000</b>	<b>.000</b>	<b>.200</b>
		<b>N</b>	<b>2200</b>						
<b>Potassium</b>	<b>Potassium</b>	<b>Correlation Coefficient</b>	<b>.134**</b>	<b>.113**</b>	<b>1.000</b>	<b>-.055**</b>	<b>.191**</b>	<b>-.106**</b>	<b>.055**</b>
		<b>Sig. (2-tailed)</b>	<b>.000</b>	<b>.000</b>	<b>.</b>	<b>.000</b>	<b>.000</b>	<b>.000</b>	<b>.000</b>
		<b>N</b>	<b>2200</b>						
<b>Temperature</b>	<b>Temperature</b>	<b>Correlation Coefficient</b>	<b>.018</b>	<b>-.094**</b>	<b>-.055**</b>	<b>1.000</b>	<b>.078**</b>	<b>.021</b>	<b>-.089**</b>
		<b>Sig. (2-tailed)</b>	<b>.208</b>	<b>.000</b>	<b>.000</b>	<b>.</b>	<b>.000</b>	<b>.146</b>	<b>.000</b>
		<b>N</b>	<b>2200</b>						
<b>Humidity</b>	<b>Humidity</b>	<b>Correlation Coefficient</b>	<b>.044**</b>	<b>-.209**</b>	<b>.191**</b>	<b>.078**</b>	<b>1.000</b>	<b>-.014</b>	<b>.062**</b>
		<b>Sig. (2-tailed)</b>	<b>.002</b>	<b>.000</b>	<b>.000</b>	<b>.000</b>	<b>.</b>	<b>.326</b>	<b>.000</b>
		<b>N</b>	<b>2200</b>						
<b>pH</b>	<b>pH</b>	<b>Correlation Coefficient</b>	<b>.090**</b>	<b>-.070**</b>	<b>-.106**</b>	<b>.021</b>	<b>-.014</b>	<b>1.000</b>	<b>-.097**</b>
		<b>Sig. (2-tailed)</b>	<b>.000</b>	<b>.000</b>	<b>.000</b>	<b>.146</b>	<b>.326</b>	<b>.</b>	<b>.000</b>
		<b>N</b>	<b>2200</b>						
<b>Rainfall</b>	<b>Rainfall</b>	<b>Correlation Coefficient</b>	<b>.011</b>	<b>-.018</b>	<b>.055**</b>	<b>-.089**</b>	<b>.062**</b>	<b>-.097**</b>	<b>1.000</b>
		<b>Sig. (2-tailed)</b>	<b>.455</b>	<b>.200</b>	<b>.000</b>	<b>.000</b>	<b>.000</b>	<b>.000</b>	<b>.</b>
		<b>N</b>	<b>2200</b>						

\*\*. Correlation is significant at the 0.01 level (2-tailed).

## 2 MVA:

A case may be omitted from an analysis because it contains one or more missing values in the variables being analyzed.

In listwise deletion a case is dropped from an analysis because it has a missing value in at least one of the specified variables. The analysis is only run on cases which have a complete set of data.

Pairwise deletion occurs when the statistical procedure uses cases that contain some missing data. The procedure cannot include a particular variable when it has a missing value, but it can still use the case when analyzing other variables with non-missing values.

**MVA VARIABLES=Nitrogen Phosphorus Potassium Temperature Humidity pH Rainfall**

/LISTWISE  
/PAIRWISE.

**Univariate Statistics**

	N	Mean	Std. Deviation	Missing		No. of Extremes	
				Count	Percent	Low	High
Nitrogen	2200	50.5518	36.91733	0	.0	0	0
Phosphorus	2200	53.3627	32.98588	0	.0	0	144
Potassium	2200	48.1491	50.64793	0	.0	0	200
Temperature	2200	25.6162	5.06375	0	.0	38	48
Humidity	2200	71.4818	22.26381	0	.0	29	0
pH	2200	6.4695	.77394	0	.0	18	39
Rainfall	2200	103.4637	54.95839	0	.0	0	99

a. Number of cases outside the range (Q1 - 1.5\*IQR, Q3 + 1.5\*IQR).

**Summary of Estimated Means**

	Nitrogen	Phosphorus	Potassium	Temperature	Humidity	pH	Rainfall
Listwise	50.5518	53.3627	48.1491	25.6162	71.4818	6.4695	103.4637
All Values	50.5518	53.3627	48.1491	25.6162	71.4818	6.4695	103.4637

**Summary of Estimated Standard Deviations**

	Nitrogen	Phosphorus	Potassium	Temperature	Humidity	pH	Rainfall
Listwise	36.91733	32.98588	50.64793	5.06375	22.26381	.77394	54.95839
All Values	36.91733	32.98588	50.64793	5.06375	22.26381	.77394	54.95839

↗ **Listwise Statistics:**

**Listwise Means**

Number of cases	Nitrogen	Phosphorus	Potassium	Temperature	Humidity	pH	Rainfall
2200	50.5518	53.3627	48.1491	25.6162	71.4818	6.4695	103.4637

**Listwise Covariances**

	Nitrogen	Phosphorus	Potassium	Temperature	Humidity	pH	Rainfall
Nitrogen	1362.88954						

Phosphorus	-281.86010	1088.06846						
Potassium	-262.72715	1229.99865	2565.21287					
Temperature	4.95462	-21.30348	-41.13423	25.64155				
Humidity	156.73070	-87.19732	215.21550	23.14740	495.67731			
pH	2.76239	-3.52349	-6.64424	-0.06974	-14616	.59898		
Rainfall	119.74715	-115.73069	-148.81121	-8.37218	115.53446	-4.63920	3020.42447	

**Listwise Correlations**

	Nitrogen	Phosphorus	Potassium	Temperature	Humidity	pH	Rainfall
<b>Nitrogen</b>	<b>1</b>						
<b>Phosphorus</b>	-.231	<b>1</b>					
<b>Potassium</b>	-.141	.736	<b>1</b>				
<b>Temperature</b>	.027	-.128	-.160	<b>1</b>			
<b>Humidity</b>	.191	-.119	.191	.205	<b>1</b>		
<b>pH</b>	.097	-.138	-.170	-.018	-.008	<b>1</b>	
<b>Rainfall</b>	.059	-.064	-.053	-.030	.094	-.109	<b>1</b>

### Pairwise Statistics:

**Pairwise Frequencies**

	Nitrogen	Phosphorus	Potassium	Temperature	Humidity	pH	Rainfall
<b>Nitrogen</b>	<b>2200</b>						
<b>Phosphorus</b>	<b>2200</b>	<b>2200</b>					
<b>Potassium</b>	<b>2200</b>	<b>2200</b>	<b>2200</b>				
<b>Temperature</b>	<b>2200</b>	<b>2200</b>	<b>2200</b>	<b>2200</b>			
<b>Humidity</b>	<b>2200</b>	<b>2200</b>	<b>2200</b>	<b>2200</b>	<b>2200</b>		
<b>pH</b>	<b>2200</b>	<b>2200</b>	<b>2200</b>	<b>2200</b>	<b>2200</b>	<b>2200</b>	
<b>Rainfall</b>	<b>2200</b>						

**Pairwise Means**

	Nitrogen	Phosphorus	Potassium	Temperatur e	Humidity	pH	Rainfall
<b>Nitrogen</b>	<b>50.5518</b>	<b>53.3627</b>	<b>48.1491</b>	<b>25.6162</b>	<b>71.4818</b>	<b>6.4695</b>	<b>103.4637</b>
<b>Phosphorus</b>	<b>50.5518</b>	<b>53.3627</b>	<b>48.1491</b>	<b>25.6162</b>	<b>71.4818</b>	<b>6.4695</b>	<b>103.4637</b>
<b>Potassium</b>	<b>50.5518</b>	<b>53.3627</b>	<b>48.1491</b>	<b>25.6162</b>	<b>71.4818</b>	<b>6.4695</b>	<b>103.4637</b>
<b>Temperature</b>	<b>50.5518</b>	<b>53.3627</b>	<b>48.1491</b>	<b>25.6162</b>	<b>71.4818</b>	<b>6.4695</b>	<b>103.4637</b>

<b>Humidity</b>	<b>50.5518</b>	<b>53.3627</b>	<b>48.1491</b>	<b>25.6162</b>	<b>71.4818</b>	<b>6.4695</b>	<b>103.4637</b>
<b>pH</b>	<b>50.5518</b>	<b>53.3627</b>	<b>48.1491</b>	<b>25.6162</b>	<b>71.4818</b>	<b>6.4695</b>	<b>103.4637</b>
<b>Rainfall</b>	<b>50.5518</b>	<b>53.3627</b>	<b>48.1491</b>	<b>25.6162</b>	<b>71.4818</b>	<b>6.4695</b>	<b>103.4637</b>

**Mean of quantitative variable when another variable is present.**

**Pairwise Standard Deviations**

	<b>Nitrogen</b>	<b>Phosphorus</b>	<b>Potassium</b>	<b>Temperatur e</b>	<b>Humidity</b>	<b>pH</b>	<b>Rainfall</b>
<b>Nitrogen</b>	<b>36.91733</b>	<b>32.98588</b>	<b>50.64793</b>	<b>5.06375</b>	<b>22.26381</b>	<b>.77394</b>	<b>54.95839</b>
<b>Phosphorus</b>	<b>36.91733</b>	<b>32.98588</b>	<b>50.64793</b>	<b>5.06375</b>	<b>22.26381</b>	<b>.77394</b>	<b>54.95839</b>
<b>Potassium</b>	<b>36.91733</b>	<b>32.98588</b>	<b>50.64793</b>	<b>5.06375</b>	<b>22.26381</b>	<b>.77394</b>	<b>54.95839</b>
<b>Temperature</b>	<b>36.91733</b>	<b>32.98588</b>	<b>50.64793</b>	<b>5.06375</b>	<b>22.26381</b>	<b>.77394</b>	<b>54.95839</b>
<b>Humidity</b>	<b>36.91733</b>	<b>32.98588</b>	<b>50.64793</b>	<b>5.06375</b>	<b>22.26381</b>	<b>.77394</b>	<b>54.95839</b>
<b>pH</b>	<b>36.91733</b>	<b>32.98588</b>	<b>50.64793</b>	<b>5.06375</b>	<b>22.26381</b>	<b>.77394</b>	<b>54.95839</b>
<b>Rainfall</b>	<b>36.91733</b>	<b>32.98588</b>	<b>50.64793</b>	<b>5.06375</b>	<b>22.26381</b>	<b>.77394</b>	<b>54.95839</b>

**Standard deviation of quantitative variable when another variable is present.**

**Pairwise Covariances**

	<b>Nitrogen</b>	<b>Phosphorus</b>	<b>Potassium</b>	<b>Temperature</b>	<b>Humidity</b>	<b>pH</b>	<b>Rainfall</b>
<b>Nitrogen</b>	<b>1362.88954</b>						
<b>Phosphorus</b>	<b>-281.86010</b>	<b>1088.06846</b>					
<b>Potassium</b>	<b>-262.72715</b>	<b>1229.99865</b>	<b>2565.21287</b>				
<b>Temperature</b>	<b>4.95462</b>	<b>-21.30348</b>	<b>-41.13423</b>	<b>25.64155</b>			
<b>Humidity</b>	<b>156.73070</b>	<b>-87.19732</b>	<b>215.21550</b>	<b>23.14740</b>	<b>495.67731</b>		
<b>pH</b>	<b>2.76239</b>	<b>-3.52349</b>	<b>-6.64424</b>	<b>-.06974</b>	<b>-.14616</b>	<b>.59898</b>	
<b>Rainfall</b>	<b>119.74715</b>	<b>-115.73069</b>	<b>-148.81121</b>	<b>-8.37218</b>	<b>115.53446</b>	<b>-4.63920</b>	<b>3020.42447</b>

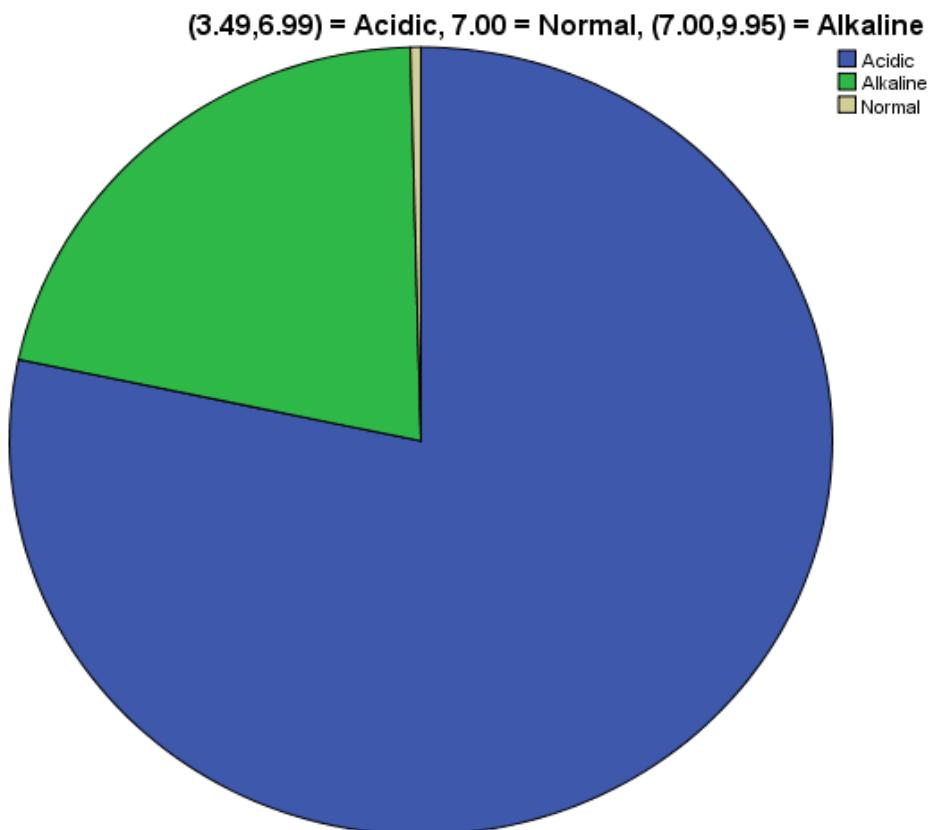
**Pairwise Correlations**

	<b>Nitrogen</b>	<b>Phosphorus</b>	<b>Potassium</b>	<b>Temperature</b>	<b>Humidity</b>	<b>pH</b>	<b>Rainfall</b>
<b>Nitrogen</b>	<b>1</b>						
<b>Phosphorus</b>	<b>-.231</b>	<b>1</b>					
<b>Potassium</b>	<b>-.141</b>	<b>.736</b>	<b>1</b>				
<b>Temperature</b>	<b>.027</b>	<b>-.128</b>	<b>-.160</b>	<b>1</b>			
<b>Humidity</b>	<b>.191</b>	<b>-.119</b>	<b>.191</b>	<b>.205</b>	<b>1</b>		
<b>pH</b>	<b>.097</b>	<b>-.138</b>	<b>-.170</b>	<b>-.018</b>	<b>-.008</b>	<b>1</b>	
<b>Rainfall</b>	<b>.059</b>	<b>-.064</b>	<b>-.053</b>	<b>-.030</b>	<b>.094</b>	<b>-.109</b>	<b>1</b>

## **Categorization of pH:**

Statistics		
<b>(3.49,6.99) = Acidic, 7.00 = Normal, (7.00,9.95) = Alkaline</b>		
<b>N</b>	<b>Valid</b>	<b>2200</b>
	<b>Missing</b>	<b>0</b>

<b>(3.49,6.99) = Acidic, 7.00 = Normal, (7.00,9.95) = Alkaline</b>					
		Frequency	Percent	Valid Percent	Cumulative Percent
<b>Valid</b>	<b>Acidic</b>	<b>1723</b>	<b>78.3</b>	<b>78.3</b>	<b>78.3</b>
	<b>Alkaline</b>	<b>468</b>	<b>21.3</b>	<b>21.3</b>	<b>99.6</b>
	<b>Normal</b>	<b>9</b>	<b>.4</b>	<b>.4</b>	<b>100.0</b>
	<b>Total</b>	<b>2200</b>	<b>100.0</b>	<b>100.0</b>	



⌚ **Missing Values per factors:**

Case Processing Summary							
	Crop	Cases					
		Valid		Missing		Total	
		N	Percent	N	Percent	N	Percent
Rainfall	apple	100	100.0%	0	0.0%	100	100.0%
	banana	100	100.0%	0	0.0%	100	100.0%
	blackgram	100	100.0%	0	0.0%	100	100.0%
	chickpea	100	100.0%	0	0.0%	100	100.0%
	coconut	100	100.0%	0	0.0%	100	100.0%
	coffee	100	100.0%	0	0.0%	100	100.0%
	cotton	100	100.0%	0	0.0%	100	100.0%
	grapes	100	100.0%	0	0.0%	100	100.0%
	jute	100	100.0%	0	0.0%	100	100.0%
	kidney beans	100	100.0%	0	0.0%	100	100.0%
	lentil	100	100.0%	0	0.0%	100	100.0%
	maize	100	100.0%	0	0.0%	100	100.0%
	mango	100	100.0%	0	0.0%	100	100.0%
	moth beans	100	100.0%	0	0.0%	100	100.0%
	mungbean	100	100.0%	0	0.0%	100	100.0%
	muskmelon	100	100.0%	0	0.0%	100	100.0%
	orange	100	100.0%	0	0.0%	100	100.0%
	papaya	100	100.0%	0	0.0%	100	100.0%
	pigeon peas	100	100.0%	0	0.0%	100	100.0%
	pomegranate	100	100.0%	0	0.0%	100	100.0%
	rice	100	100.0%	0	0.0%	100	100.0%
	watermelon	100	100.0%	0	0.0%	100	100.0%

Case Processing Summary							
	Crop	Cases					
		Valid		Missing		Total	
		N	Percent	N	Percent	N	Percent
pH	apple	100	100.0%	0	0.0%	100	100.0%
	banana	100	100.0%	0	0.0%	100	100.0%
	blackgram	100	100.0%	0	0.0%	100	100.0%
	chickpea	100	100.0%	0	0.0%	100	100.0%
	coconut	100	100.0%	0	0.0%	100	100.0%
	coffee	100	100.0%	0	0.0%	100	100.0%

	cotton	100	100.0%	0	0.0%	100	100.0%
	grapes	100	100.0%	0	0.0%	100	100.0%
	jute	100	100.0%	0	0.0%	100	100.0%
	kidney beans	100	100.0%	0	0.0%	100	100.0%
	lentil	100	100.0%	0	0.0%	100	100.0%
	maize	100	100.0%	0	0.0%	100	100.0%
	mango	100	100.0%	0	0.0%	100	100.0%
	moth bean	100	100.0%	0	0.0%	100	100.0%
	mungbean	100	100.0%	0	0.0%	100	100.0%
	muskmelon	100	100.0%	0	0.0%	100	100.0%
	orange	100	100.0%	0	0.0%	100	100.0%
	papaya	100	100.0%	0	0.0%	100	100.0%
	pigeon peas	100	100.0%	0	0.0%	100	100.0%
	pomegranate	100	100.0%	0	0.0%	100	100.0%
	rice	100	100.0%	0	0.0%	100	100.0%
	watermelon	100	100.0%	0	0.0%	100	100.0%

Case Processing Summary							
Humidity	Crop	Cases					
		Valid		Missing		Total	
		N	Percent	N	Percent	N	Percent
	apple	100	100.0%	0	0.0%	100	100.0%
	banana	100	100.0%	0	0.0%	100	100.0%
	Blackgram	100	100.0%	0	0.0%	100	100.0%
	chickpea	100	100.0%	0	0.0%	100	100.0%
	coconut	100	100.0%	0	0.0%	100	100.0%
	coffee	100	100.0%	0	0.0%	100	100.0%
	cotton	100	100.0%	0	0.0%	100	100.0%
	grapes	100	100.0%	0	0.0%	100	100.0%
	jute	100	100.0%	0	0.0%	100	100.0%
	kidney bean	100	100.0%	0	0.0%	100	100.0%
	lentil	100	100.0%	0	0.0%	100	100.0%
	maize	100	100.0%	0	0.0%	100	100.0%
	mango	100	100.0%	0	0.0%	100	100.0%
	moth bean	100	100.0%	0	0.0%	100	100.0%
	mungbean	100	100.0%	0	0.0%	100	100.0%
	muskmelon	100	100.0%	0	0.0%	100	100.0%
	orange	100	100.0%	0	0.0%	100	100.0%
	papaya	100	100.0%	0	0.0%	100	100.0%

	pigeon peas	100	100.0%	0	0.0%	100	100.0%
	pomegranate	100	100.0%	0	0.0%	100	100.0%
	rice	100	100.0%	0	0.0%	100	100.0%
	watermelon	100	100.0%	0	0.0%	100	100.0%

Case Processing Summary							
	Crop	Cases					
		Valid		Missing		Total	
		N	Percent	N	Percent	N	Percent
Temperature	apple	100	100.0%	0	0.0%	100	100.0%
	banana	100	100.0%	0	0.0%	100	100.0%
	blackgram	100	100.0%	0	0.0%	100	100.0%
	chickpea	100	100.0%	0	0.0%	100	100.0%
	coconut	100	100.0%	0	0.0%	100	100.0%
	coffee	100	100.0%	0	0.0%	100	100.0%
	cotton	100	100.0%	0	0.0%	100	100.0%
	grapes	100	100.0%	0	0.0%	100	100.0%
	jute	100	100.0%	0	0.0%	100	100.0%
	kidney beans	100	100.0%	0	0.0%	100	100.0%
	lentil	100	100.0%	0	0.0%	100	100.0%
	maize	100	100.0%	0	0.0%	100	100.0%
	mango	100	100.0%	0	0.0%	100	100.0%
	moth bean	100	100.0%	0	0.0%	100	100.0%
	mungbean	100	100.0%	0	0.0%	100	100.0%
	muskmelon	100	100.0%	0	0.0%	100	100.0%
	orange	100	100.0%	0	0.0%	100	100.0%
	papaya	100	100.0%	0	0.0%	100	100.0%
	pigeon peas	100	100.0%	0	0.0%	100	100.0%
	pomegranate	100	100.0%	0	0.0%	100	100.0%
	rice	100	100.0%	0	0.0%	100	100.0%
	watermelon	100	100.0%	0	0.0%	100	100.0%

Case Processing Summary							
	Crop	Cases					
		Valid		Missing		Total	
		N	Percent	N	Percent	N	Percent
Potassium	apple	100	100.0%	0	0.0%	100	100.0%
	banana	100	100.0%	0	0.0%	100	100.0%

	<b>blackgram</b>	<b>100</b>	<b>100.0%</b>	<b>0</b>	<b>0.0%</b>	<b>100</b>	<b>100.0%</b>
	<b>chickpea</b>	<b>100</b>	<b>100.0%</b>	<b>0</b>	<b>0.0%</b>	<b>100</b>	<b>100.0%</b>
	<b>coconut</b>	<b>100</b>	<b>100.0%</b>	<b>0</b>	<b>0.0%</b>	<b>100</b>	<b>100.0%</b>
	<b>coffee</b>	<b>100</b>	<b>100.0%</b>	<b>0</b>	<b>0.0%</b>	<b>100</b>	<b>100.0%</b>
	<b>cotton</b>	<b>100</b>	<b>100.0%</b>	<b>0</b>	<b>0.0%</b>	<b>100</b>	<b>100.0%</b>
	<b>grapes</b>	<b>100</b>	<b>100.0%</b>	<b>0</b>	<b>0.0%</b>	<b>100</b>	<b>100.0%</b>
	<b>jute</b>	<b>100</b>	<b>100.0%</b>	<b>0</b>	<b>0.0%</b>	<b>100</b>	<b>100.0%</b>
	<b>kidney beans</b>	<b>100</b>	<b>100.0%</b>	<b>0</b>	<b>0.0%</b>	<b>100</b>	<b>100.0%</b>
	<b>lentil</b>	<b>100</b>	<b>100.0%</b>	<b>0</b>	<b>0.0%</b>	<b>100</b>	<b>100.0%</b>
	<b>maize</b>	<b>100</b>	<b>100.0%</b>	<b>0</b>	<b>0.0%</b>	<b>100</b>	<b>100.0%</b>
	<b>mango</b>	<b>100</b>	<b>100.0%</b>	<b>0</b>	<b>0.0%</b>	<b>100</b>	<b>100.0%</b>
	<b>moth bean</b>	<b>100</b>	<b>100.0%</b>	<b>0</b>	<b>0.0%</b>	<b>100</b>	<b>100.0%</b>
	<b>mungbean</b>	<b>100</b>	<b>100.0%</b>	<b>0</b>	<b>0.0%</b>	<b>100</b>	<b>100.0%</b>
	<b>muskmelon</b>	<b>100</b>	<b>100.0%</b>	<b>0</b>	<b>0.0%</b>	<b>100</b>	<b>100.0%</b>
	<b>orange</b>	<b>100</b>	<b>100.0%</b>	<b>0</b>	<b>0.0%</b>	<b>100</b>	<b>100.0%</b>
	<b>papaya</b>	<b>100</b>	<b>100.0%</b>	<b>0</b>	<b>0.0%</b>	<b>100</b>	<b>100.0%</b>
	<b>pigeon peas</b>	<b>100</b>	<b>100.0%</b>	<b>0</b>	<b>0.0%</b>	<b>100</b>	<b>100.0%</b>
	<b>pomegranate</b>	<b>100</b>	<b>100.0%</b>	<b>0</b>	<b>0.0%</b>	<b>100</b>	<b>100.0%</b>
	<b>rice</b>	<b>100</b>	<b>100.0%</b>	<b>0</b>	<b>0.0%</b>	<b>100</b>	<b>100.0%</b>
	<b>watermelon</b>	<b>100</b>	<b>100.0%</b>	<b>0</b>	<b>0.0%</b>	<b>100</b>	<b>100.0%</b>

Case Processing Summary							
	Crop	Cases					
		Valid		Missing		Total	
		N	Percent	N	Percent	N	Percent
<b>Phosphorus</b>	<b>apple</b>	<b>100</b>	<b>100.0%</b>	<b>0</b>	<b>0.0%</b>	<b>100</b>	<b>100.0%</b>
	<b>banana</b>	<b>100</b>	<b>100.0%</b>	<b>0</b>	<b>0.0%</b>	<b>100</b>	<b>100.0%</b>
	<b>blackgram</b>	<b>100</b>	<b>100.0%</b>	<b>0</b>	<b>0.0%</b>	<b>100</b>	<b>100.0%</b>
	<b>chickpea</b>	<b>100</b>	<b>100.0%</b>	<b>0</b>	<b>0.0%</b>	<b>100</b>	<b>100.0%</b>
	<b>coconut</b>	<b>100</b>	<b>100.0%</b>	<b>0</b>	<b>0.0%</b>	<b>100</b>	<b>100.0%</b>
	<b>coffee</b>	<b>100</b>	<b>100.0%</b>	<b>0</b>	<b>0.0%</b>	<b>100</b>	<b>100.0%</b>
	<b>cotton</b>	<b>100</b>	<b>100.0%</b>	<b>0</b>	<b>0.0%</b>	<b>100</b>	<b>100.0%</b>
	<b>grapes</b>	<b>100</b>	<b>100.0%</b>	<b>0</b>	<b>0.0%</b>	<b>100</b>	<b>100.0%</b>
	<b>jute</b>	<b>100</b>	<b>100.0%</b>	<b>0</b>	<b>0.0%</b>	<b>100</b>	<b>100.0%</b>
	<b>kidney beans</b>	<b>100</b>	<b>100.0%</b>	<b>0</b>	<b>0.0%</b>	<b>100</b>	<b>100.0%</b>
	<b>lentil</b>	<b>100</b>	<b>100.0%</b>	<b>0</b>	<b>0.0%</b>	<b>100</b>	<b>100.0%</b>
	<b>maize</b>	<b>100</b>	<b>100.0%</b>	<b>0</b>	<b>0.0%</b>	<b>100</b>	<b>100.0%</b>
	<b>mango</b>	<b>100</b>	<b>100.0%</b>	<b>0</b>	<b>0.0%</b>	<b>100</b>	<b>100.0%</b>
	<b>moth bean</b>	<b>100</b>	<b>100.0%</b>	<b>0</b>	<b>0.0%</b>	<b>100</b>	<b>100.0%</b>

	<b>mungbean</b>	<b>100</b>	<b>100.0%</b>	<b>0</b>	<b>0.0%</b>	<b>100</b>	<b>100.0%</b>
	<b>muskmelon</b>	<b>100</b>	<b>100.0%</b>	<b>0</b>	<b>0.0%</b>	<b>100</b>	<b>100.0%</b>
	<b>orange</b>	<b>100</b>	<b>100.0%</b>	<b>0</b>	<b>0.0%</b>	<b>100</b>	<b>100.0%</b>
	<b>papaya</b>	<b>100</b>	<b>100.0%</b>	<b>0</b>	<b>0.0%</b>	<b>100</b>	<b>100.0%</b>
	<b>pigeon peas</b>	<b>100</b>	<b>100.0%</b>	<b>0</b>	<b>0.0%</b>	<b>100</b>	<b>100.0%</b>
	<b>pomegranate</b>	<b>100</b>	<b>100.0%</b>	<b>0</b>	<b>0.0%</b>	<b>100</b>	<b>100.0%</b>
	<b>rice</b>	<b>100</b>	<b>100.0%</b>	<b>0</b>	<b>0.0%</b>	<b>100</b>	<b>100.0%</b>
	<b>watermelon</b>	<b>100</b>	<b>100.0%</b>	<b>0</b>	<b>0.0%</b>	<b>100</b>	<b>100.0%</b>

Case Processing Summary							
	Crop	Cases					
		Valid		Missing		Total	
		N	Percent	N	Percent	N	Percent
Nitrogen	<b>apple</b>	<b>100</b>	<b>100.0%</b>	<b>0</b>	<b>0.0%</b>	<b>100</b>	<b>100.0%</b>
	<b>banana</b>	<b>100</b>	<b>100.0%</b>	<b>0</b>	<b>0.0%</b>	<b>100</b>	<b>100.0%</b>
	<b>blackgram</b>	<b>100</b>	<b>100.0%</b>	<b>0</b>	<b>0.0%</b>	<b>100</b>	<b>100.0%</b>
	<b>chickpea</b>	<b>100</b>	<b>100.0%</b>	<b>0</b>	<b>0.0%</b>	<b>100</b>	<b>100.0%</b>
	<b>coconut</b>	<b>100</b>	<b>100.0%</b>	<b>0</b>	<b>0.0%</b>	<b>100</b>	<b>100.0%</b>
	<b>coffee</b>	<b>100</b>	<b>100.0%</b>	<b>0</b>	<b>0.0%</b>	<b>100</b>	<b>100.0%</b>
	<b>cotton</b>	<b>100</b>	<b>100.0%</b>	<b>0</b>	<b>0.0%</b>	<b>100</b>	<b>100.0%</b>
	<b>grapes</b>	<b>100</b>	<b>100.0%</b>	<b>0</b>	<b>0.0%</b>	<b>100</b>	<b>100.0%</b>
	<b>jute</b>	<b>100</b>	<b>100.0%</b>	<b>0</b>	<b>0.0%</b>	<b>100</b>	<b>100.0%</b>
	<b>kidney beans</b>	<b>100</b>	<b>100.0%</b>	<b>0</b>	<b>0.0%</b>	<b>100</b>	<b>100.0%</b>
	<b>lentil</b>	<b>100</b>	<b>100.0%</b>	<b>0</b>	<b>0.0%</b>	<b>100</b>	<b>100.0%</b>
	<b>maize</b>	<b>100</b>	<b>100.0%</b>	<b>0</b>	<b>0.0%</b>	<b>100</b>	<b>100.0%</b>
	<b>mango</b>	<b>100</b>	<b>100.0%</b>	<b>0</b>	<b>0.0%</b>	<b>100</b>	<b>100.0%</b>
	<b>moth bean</b>	<b>100</b>	<b>100.0%</b>	<b>0</b>	<b>0.0%</b>	<b>100</b>	<b>100.0%</b>
	<b>mungbean</b>	<b>100</b>	<b>100.0%</b>	<b>0</b>	<b>0.0%</b>	<b>100</b>	<b>100.0%</b>
	<b>muskmelon</b>	<b>100</b>	<b>100.0%</b>	<b>0</b>	<b>0.0%</b>	<b>100</b>	<b>100.0%</b>
	<b>orange</b>	<b>100</b>	<b>100.0%</b>	<b>0</b>	<b>0.0%</b>	<b>100</b>	<b>100.0%</b>
	<b>papaya</b>	<b>100</b>	<b>100.0%</b>	<b>0</b>	<b>0.0%</b>	<b>100</b>	<b>100.0%</b>
	<b>pigeon peas</b>	<b>100</b>	<b>100.0%</b>	<b>0</b>	<b>0.0%</b>	<b>100</b>	<b>100.0%</b>
	<b>pomegranate</b>	<b>100</b>	<b>100.0%</b>	<b>0</b>	<b>0.0%</b>	<b>100</b>	<b>100.0%</b>
	<b>rice</b>	<b>100</b>	<b>100.0%</b>	<b>0</b>	<b>0.0%</b>	<b>100</b>	<b>100.0%</b>
	<b>watermelon</b>	<b>100</b>	<b>100.0%</b>	<b>0</b>	<b>0.0%</b>	<b>100</b>	<b>100.0%</b>

### Normality test:

The Shapiro-Wilk test is more appropriate method for small sample sizes (<50 samples) although it can also be handling on larger sample size while Kolmogorov-Smirnov test is used for n ≥50.

If the sample size is over 2000, the Kolmogorov test should be used. If the sample size is less than 2000, the Shapiro test is better. The null hypothesis of a normality test is that there is no significant departure from normality.

The Kolmogorov-Smirnov test is used to test the null hypothesis that a set of data comes from a Normal distribution. The Kolmogorov Smirnov test produces test statistics that are used (along with a degree of freedom parameter) to test for normality. (A variable is not normally distributed if “Sig.” < 0.05, reject the null hypothesis if p < 0.05. In other words, If the Kolmogorov-Smirnov test is significant (e.g., p<.05) then it indicates that the distribution of our sample is significantly different from the distribution against which it is being compared, e.g., a normal distribution (therefore the sample distribution does not fit the assumption of normality).)

The Shapiro-Wilk test can be used to decide whether or not a sample fits a normal distribution, and it is commonly used for small samples. (If the test is non-significant ( $p > .05$ ) it tells us that the distribution of the sample is not significantly different from a normal distribution. If, however, the test is significant ( $p < .05$ ) then the distribution in question is significantly different from a normal distribution. In other words, the Shapiro-Wilk test p-value is less than  $\alpha = 0.05$ , leading to reject  $H_0$  : data are normally distributed. In conclusion, the eruptions data is not normally distributed.)

For quick and visual identification of a normal distribution, use a QQ plot if you have only one variable to look at and a Box Plot if you have many. Use a histogram if you need to present your results to a non-statistical public. As a statistical test to confirm your hypothesis, use the Shapiro Wilk test.

Assumptions of the Kolmogorov test: The null hypothesis is both samples are randomly drawn from the same (pooled) set of values. The two samples are mutually independent. The scale of measurement is at least ordinal.

For the formal tests (KS and Shapiro-Wilk), look for p-values greater than 5%. Assuming you ran the analysis with the default .05 alpha level, any values less than .05 would cause you to reject the null hypothesis that the data follows a normal distribution.

For less formal analysis, check the histogram and QQ plots to see if the data roughly follows a normal distribution. For the QQ (Quantile-Quantile) plot, your data should be clustered close to the line.

Also, the skewness and kurtosis should be no greater than  $\pm 1$ , otherwise, your data is non normal. Small skew and kurtosis values indicate the distribution is approximately normal.

QQ plots can be used to compare the distribution of a variable with a chosen distribution (typically a normal distribution as we are doing here). The data are plotted against a theoretical normal distribution (with the same mean and variance as the sample data) in such a way that the points should form an approximate straight line. Departures from this straight line indicate departures from normality. As we found a significant effect in the Kolmogorov Smirnov test we should see points diverging from the line in the plot above with either some outlying values lying away from the line or even the shape of the points forming a non-linear pattern. However, the small departures from normality would not usually prevent us from employing parametric statistical methods.

#### Explore:

Case Processing Summary			
	Cases		
	Valid	Missing	Total

	N	Percent	N	Percent	N	Percent
<b>Nitrogen</b>	<b>2200</b>	<b>100.0%</b>	<b>0</b>	<b>0.0%</b>	<b>2200</b>	<b>100.0%</b>
<b>Phosphorus</b>	<b>2200</b>	<b>100.0%</b>	<b>0</b>	<b>0.0%</b>	<b>2200</b>	<b>100.0%</b>
<b>Potassium</b>	<b>2200</b>	<b>100.0%</b>	<b>0</b>	<b>0.0%</b>	<b>2200</b>	<b>100.0%</b>
<b>Temperature</b>	<b>2200</b>	<b>100.0%</b>	<b>0</b>	<b>0.0%</b>	<b>2200</b>	<b>100.0%</b>
<b>Humidity</b>	<b>2200</b>	<b>100.0%</b>	<b>0</b>	<b>0.0%</b>	<b>2200</b>	<b>100.0%</b>
<b>pH</b>	<b>2200</b>	<b>100.0%</b>	<b>0</b>	<b>0.0%</b>	<b>2200</b>	<b>100.0%</b>
<b>Rainfall</b>	<b>2200</b>	<b>100.0%</b>	<b>0</b>	<b>0.0%</b>	<b>2200</b>	<b>100.0%</b>

Descriptives			
		Statistic	Std. Error
<b>Nitrogen</b>	<b>Mean</b>	<b>50.5518</b>	<b>.78708</b>
	<b>95% Confidence Interval for</b>	<b>Lower Bound</b>	<b>49.0083</b>
	<b>Mean</b>	<b>Upper Bound</b>	<b>52.0953</b>
	<b>5% Trimmed Mean</b>	<b>49.2667</b>	
	<b>Median</b>	<b>37.0000</b>	
	<b>Variance</b>	<b>1362.890</b>	
	<b>Std. Deviation</b>	<b>36.91733</b>	
	<b>Minimum</b>	<b>.00</b>	
	<b>Maximum</b>	<b>140.00</b>	
	<b>Range</b>	<b>140.00</b>	
	<b>Interquartile Range</b>	<b>63.75</b>	
	<b>Skewness</b>	<b>.510</b>	<b>.052</b>
	<b>Kurtosis</b>	<b>-1.058</b>	<b>.104</b>
<b>Phosphorus</b>	<b>Mean</b>	<b>53.3627</b>	<b>.70326</b>
	<b>95% Confidence Interval for</b>	<b>Lower Bound</b>	<b>51.9836</b>
	<b>Mean</b>	<b>Upper Bound</b>	<b>54.7419</b>
	<b>5% Trimmed Mean</b>	<b>51.1490</b>	
	<b>Median</b>	<b>51.0000</b>	
	<b>Variance</b>	<b>1088.068</b>	
	<b>Std. Deviation</b>	<b>32.98588</b>	
	<b>Minimum</b>	<b>5.00</b>	
	<b>Maximum</b>	<b>145.00</b>	
	<b>Range</b>	<b>140.00</b>	
	<b>Interquartile Range</b>	<b>40.00</b>	
	<b>Skewness</b>	<b>1.011</b>	<b>.052</b>
	<b>Kurtosis</b>	<b>.860</b>	<b>.104</b>
<b>Potassium</b>	<b>Mean</b>	<b>48.1491</b>	<b>1.07982</b>
		<b>Lower Bound</b>	<b>46.0315</b>

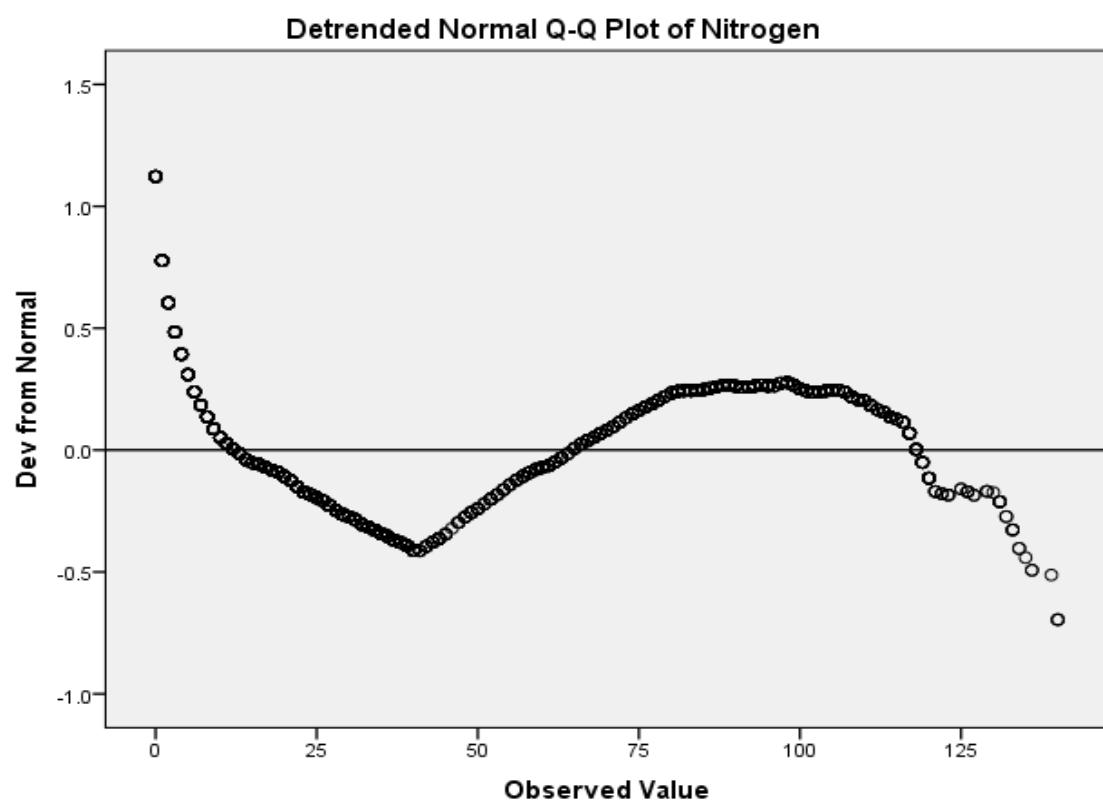
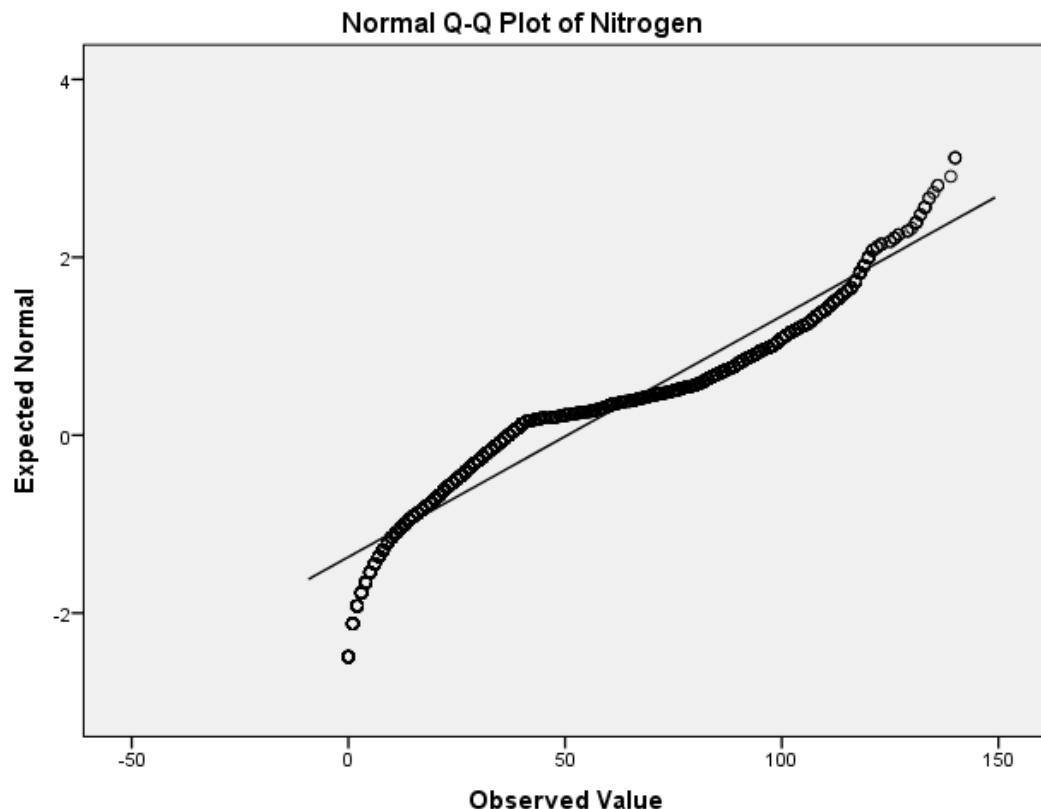
	<b>95% Confidence Interval for Mean</b>	<b>Upper Bound</b>	<b>50.2667</b>	
	<b>5% Trimmed Mean</b>		<b>41.6611</b>	
	<b>Median</b>		<b>32.0000</b>	
	<b>Variance</b>		<b>2565.213</b>	
	<b>Std. Deviation</b>		<b>50.64793</b>	
	<b>Minimum</b>		<b>5.00</b>	
	<b>Maximum</b>		<b>205.00</b>	
	<b>Range</b>		<b>200.00</b>	
	<b>Interquartile Range</b>		<b>29.00</b>	
	<b>Skewness</b>		<b>2.375</b>	<b>.052</b>
	<b>Kurtosis</b>		<b>4.449</b>	<b>.104</b>
<b>Temperature</b>	<b>Mean</b>		<b>25.6162</b>	<b>.10796</b>
	<b>95% Confidence Interval for Mean</b>	<b>Lower Bound</b>	<b>25.4045</b>	
	<b>Mean</b>	<b>Upper Bound</b>	<b>25.8280</b>	
	<b>5% Trimmed Mean</b>		<b>25.5411</b>	
	<b>Median</b>		<b>25.5987</b>	
	<b>Variance</b>		<b>25.642</b>	
	<b>Std. Deviation</b>		<b>5.06375</b>	
	<b>Minimum</b>		<b>8.83</b>	
	<b>Maximum</b>		<b>43.68</b>	
	<b>Range</b>		<b>34.85</b>	
	<b>Interquartile Range</b>		<b>5.79</b>	
	<b>Skewness</b>		<b>.185</b>	<b>.052</b>
	<b>Kurtosis</b>		<b>1.233</b>	<b>.104</b>
<b>Humidity</b>	<b>Mean</b>		<b>71.4818</b>	<b>.47467</b>
	<b>95% Confidence Interval for Mean</b>	<b>Lower Bound</b>	<b>70.5509</b>	
	<b>Mean</b>	<b>Upper Bound</b>	<b>72.4126</b>	
	<b>5% Trimmed Mean</b>		<b>73.1632</b>	
	<b>Median</b>		<b>80.4731</b>	
	<b>Variance</b>		<b>495.677</b>	
	<b>Std. Deviation</b>		<b>22.26381</b>	
	<b>Minimum</b>		<b>14.26</b>	
	<b>Maximum</b>		<b>99.98</b>	
	<b>Range</b>		<b>85.72</b>	
	<b>Interquartile Range</b>		<b>29.72</b>	
	<b>Skewness</b>		<b>-1.092</b>	<b>.052</b>
	<b>Kurtosis</b>		<b>.302</b>	<b>.104</b>
<b>pH</b>	<b>Mean</b>		<b>6.4695</b>	<b>.01650</b>

	<b>95% Confidence Interval for Mean</b>	<b>Lower Bound</b>	<b>6.4371</b>	
		<b>Upper Bound</b>	<b>6.5018</b>	
	<b>5% Trimmed Mean</b>		<b>6.4601</b>	
	<b>Median</b>		<b>6.4250</b>	
	<b>Variance</b>		<b>.599</b>	
	<b>Std. Deviation</b>		<b>.77394</b>	
	<b>Minimum</b>		<b>3.50</b>	
	<b>Maximum</b>		<b>9.94</b>	
	<b>Range</b>		<b>6.43</b>	
	<b>Interquartile Range</b>		<b>.95</b>	
	<b>Skewness</b>		<b>.284</b>	<b>.052</b>
	<b>Kurtosis</b>		<b>1.656</b>	<b>.104</b>
<b>Rainfall</b>	<b>Mean</b>		<b>103.4637</b>	<b>1.17172</b>
	<b>95% Confidence Interval for Mean</b>	<b>Lower Bound</b>	<b>101.1659</b>	
		<b>Upper Bound</b>	<b>105.7614</b>	
	<b>5% Trimmed Mean</b>		<b>100.0423</b>	
	<b>Median</b>		<b>94.8676</b>	
	<b>Variance</b>		<b>3020.424</b>	
	<b>Std. Deviation</b>		<b>54.95839</b>	
	<b>Minimum</b>		<b>20.21</b>	
	<b>Maximum</b>		<b>298.56</b>	
	<b>Range</b>		<b>278.35</b>	
	<b>Interquartile Range</b>		<b>59.81</b>	
	<b>Skewness</b>		<b>.966</b>	<b>.052</b>
	<b>Kurtosis</b>		<b>.607</b>	<b>.104</b>

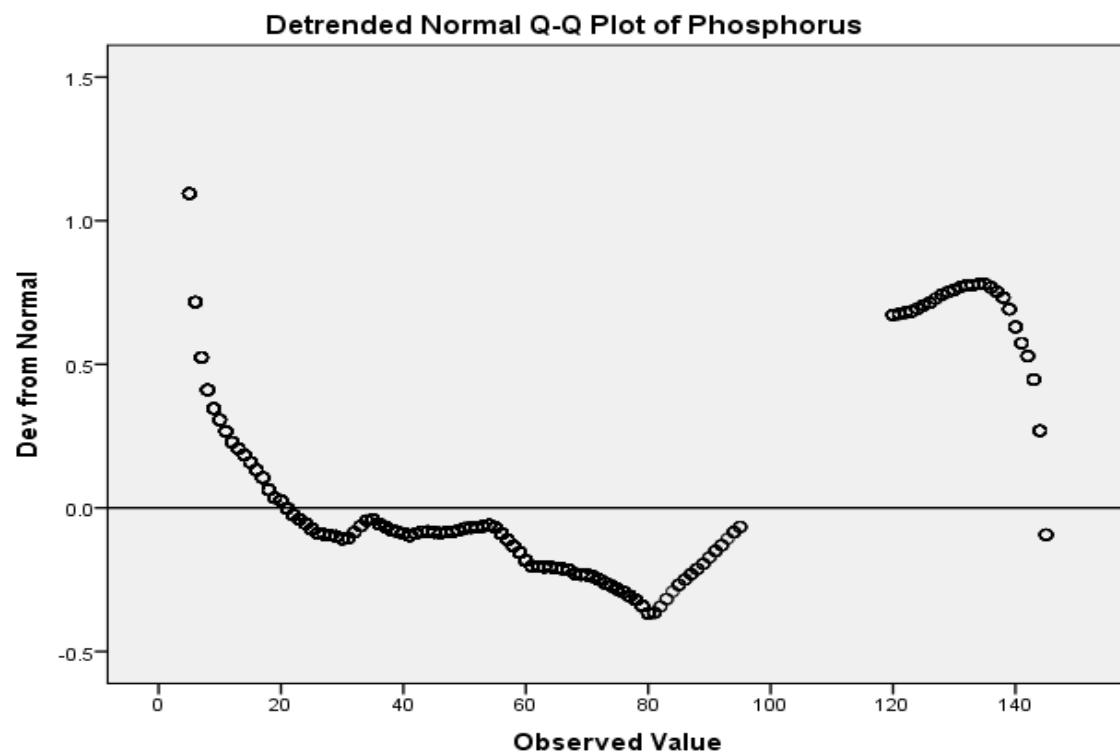
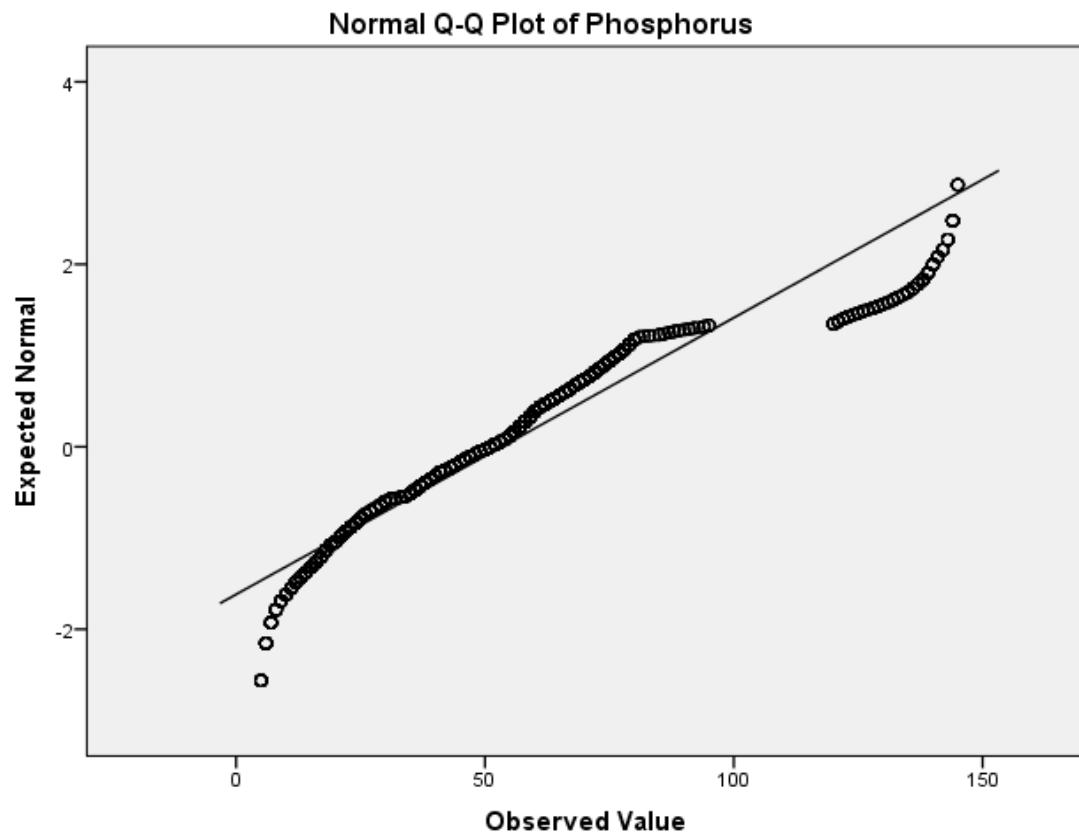
Tests of Normality						
	Kolmogorov-Smirnov <sup>a</sup>			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
<b>Nitrogen</b>	<b>.173</b>	<b>2200</b>	<b>.000</b>	<b>.915</b>	<b>2200</b>	<b>.000</b>
<b>Phosphorus</b>	<b>.094</b>	<b>2200</b>	<b>.000</b>	<b>.911</b>	<b>2200</b>	<b>.000</b>
<b>Potassium</b>	<b>.310</b>	<b>2200</b>	<b>.000</b>	<b>.606</b>	<b>2200</b>	<b>.000</b>
<b>Temperature</b>	<b>.059</b>	<b>2200</b>	<b>.000</b>	<b>.982</b>	<b>2200</b>	<b>.000</b>
<b>Humidity</b>	<b>.172</b>	<b>2200</b>	<b>.000</b>	<b>.866</b>	<b>2200</b>	<b>.000</b>
<b>pH</b>	<b>.052</b>	<b>2200</b>	<b>.000</b>	<b>.979</b>	<b>2200</b>	<b>.000</b>
<b>Rainfall</b>	<b>.119</b>	<b>2200</b>	<b>.000</b>	<b>.930</b>	<b>2200</b>	<b>.000</b>

a. Lilliefors Significance Correction

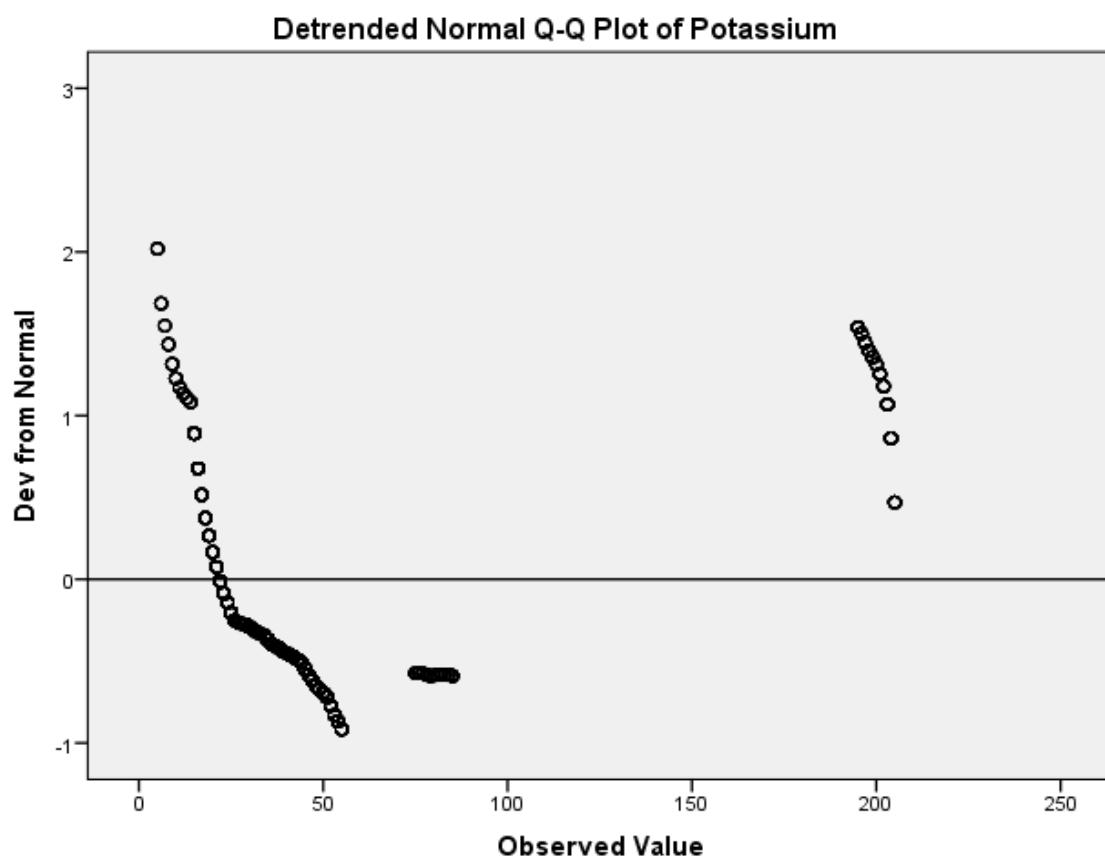
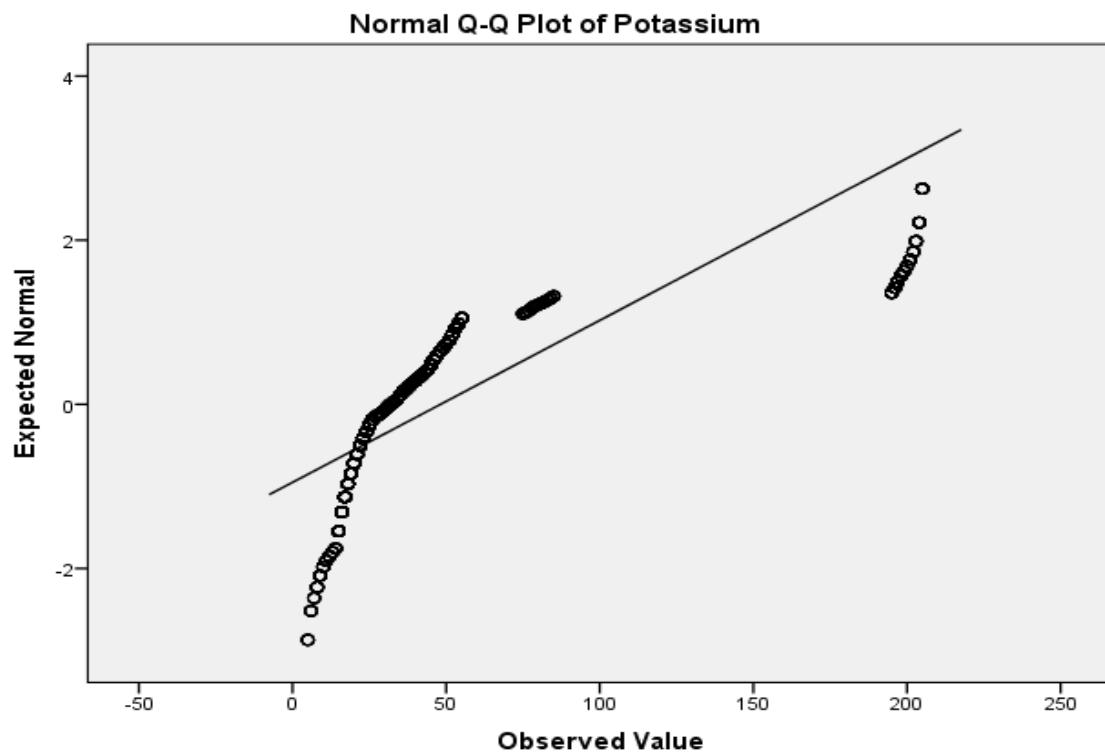
**Nitrogen:**



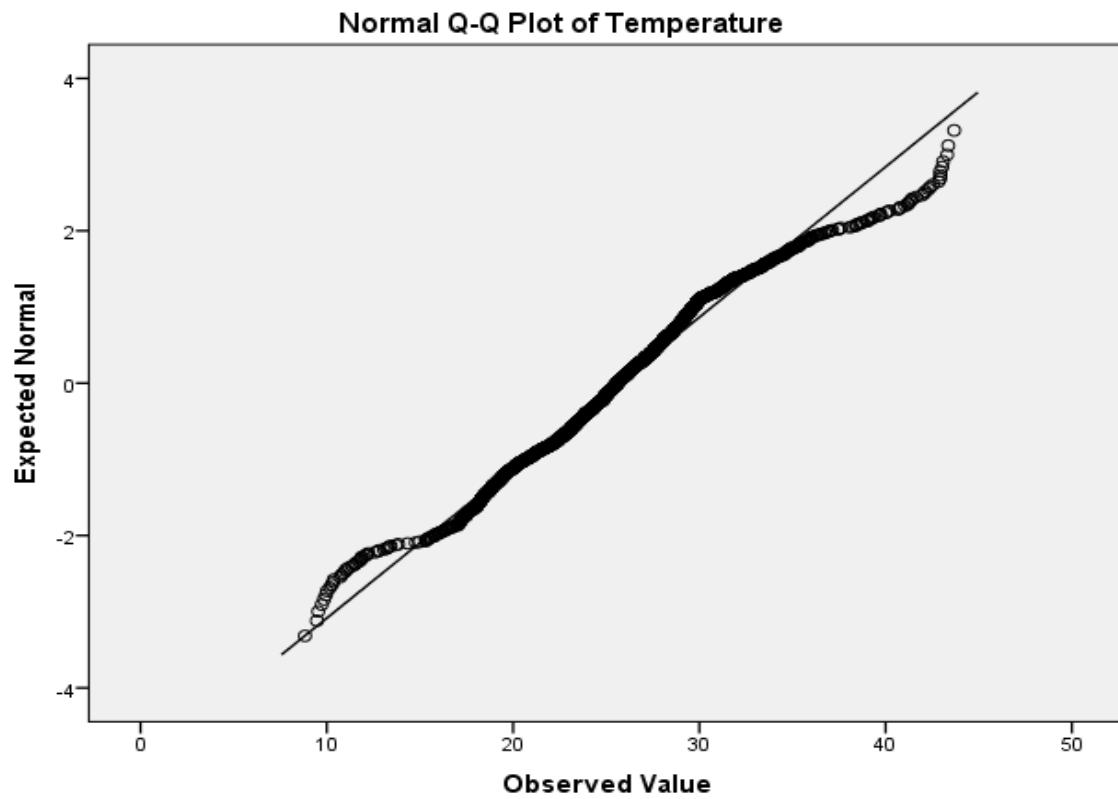
**Phosphorus:**



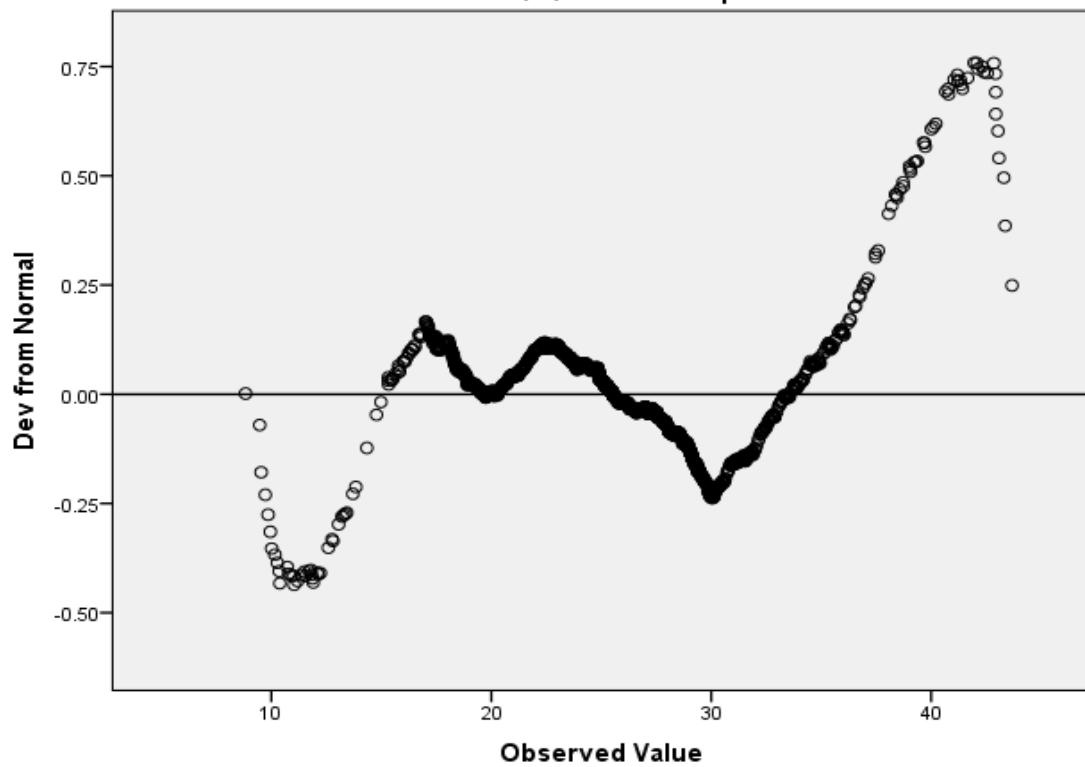
**Potassium:**



**Temperature:**

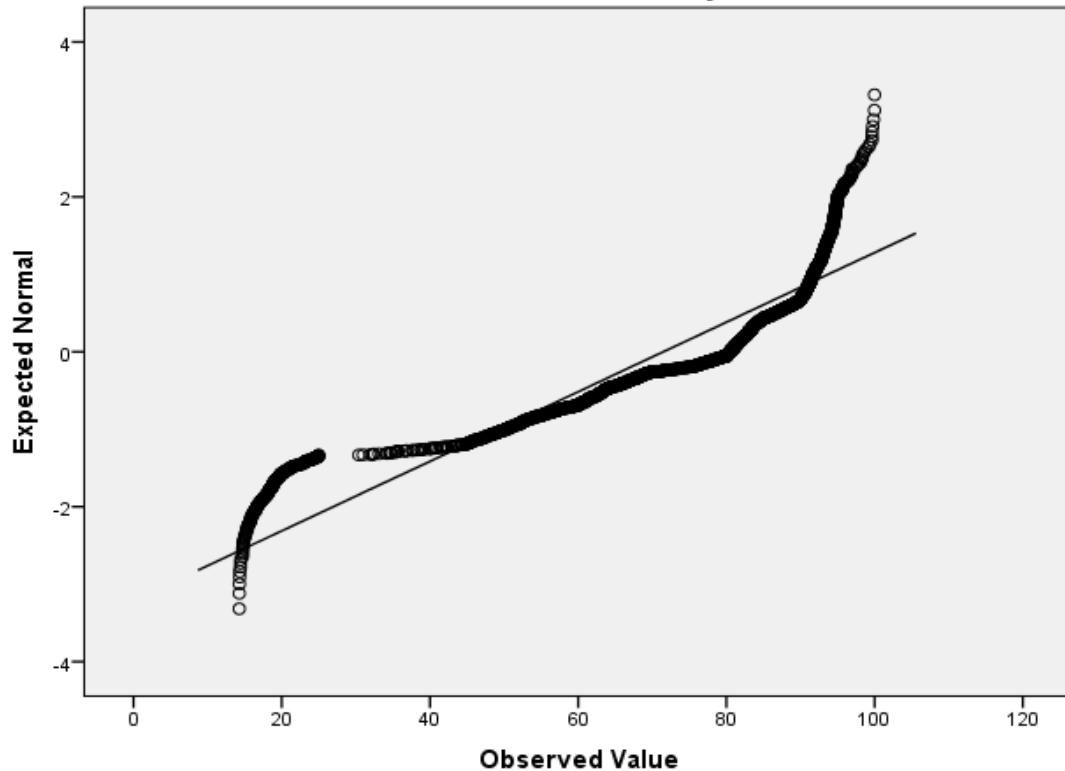


**Detrended Normal Q-Q Plot of Temperature**

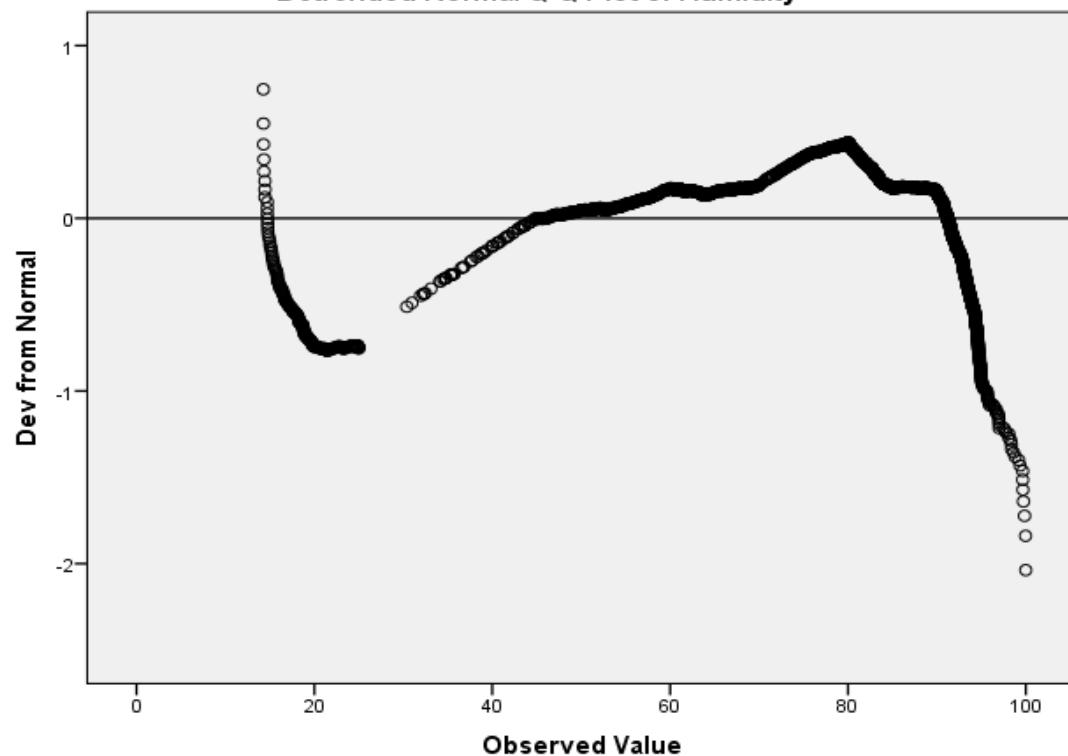


**Humidity:**

**Normal Q-Q Plot of Humidity**

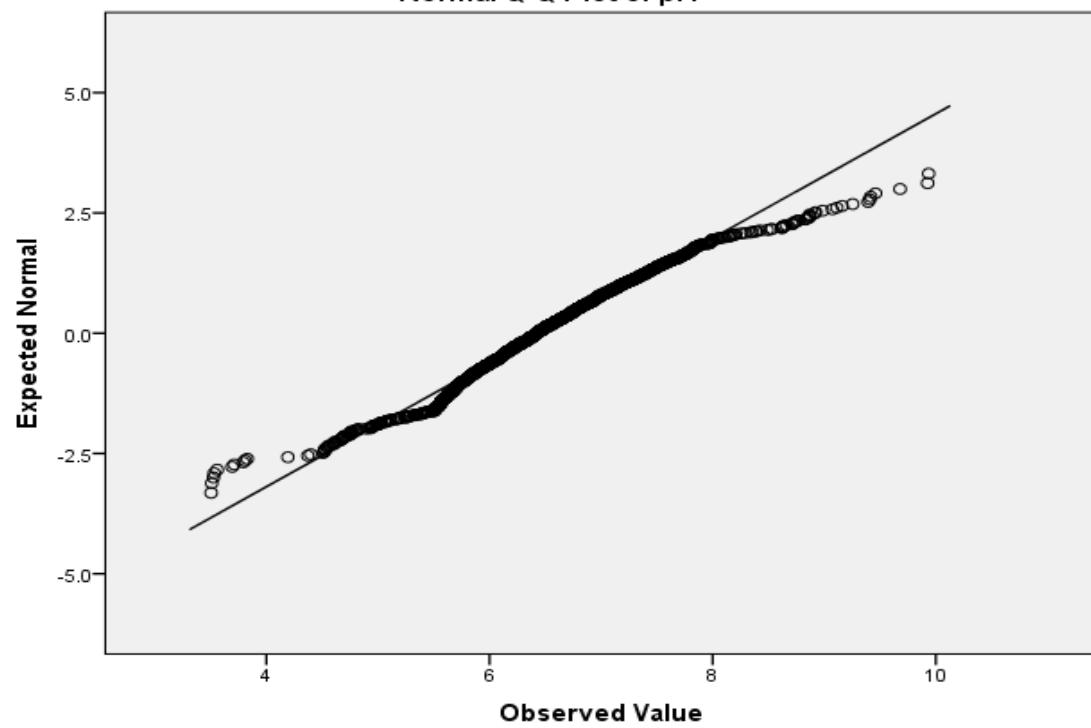


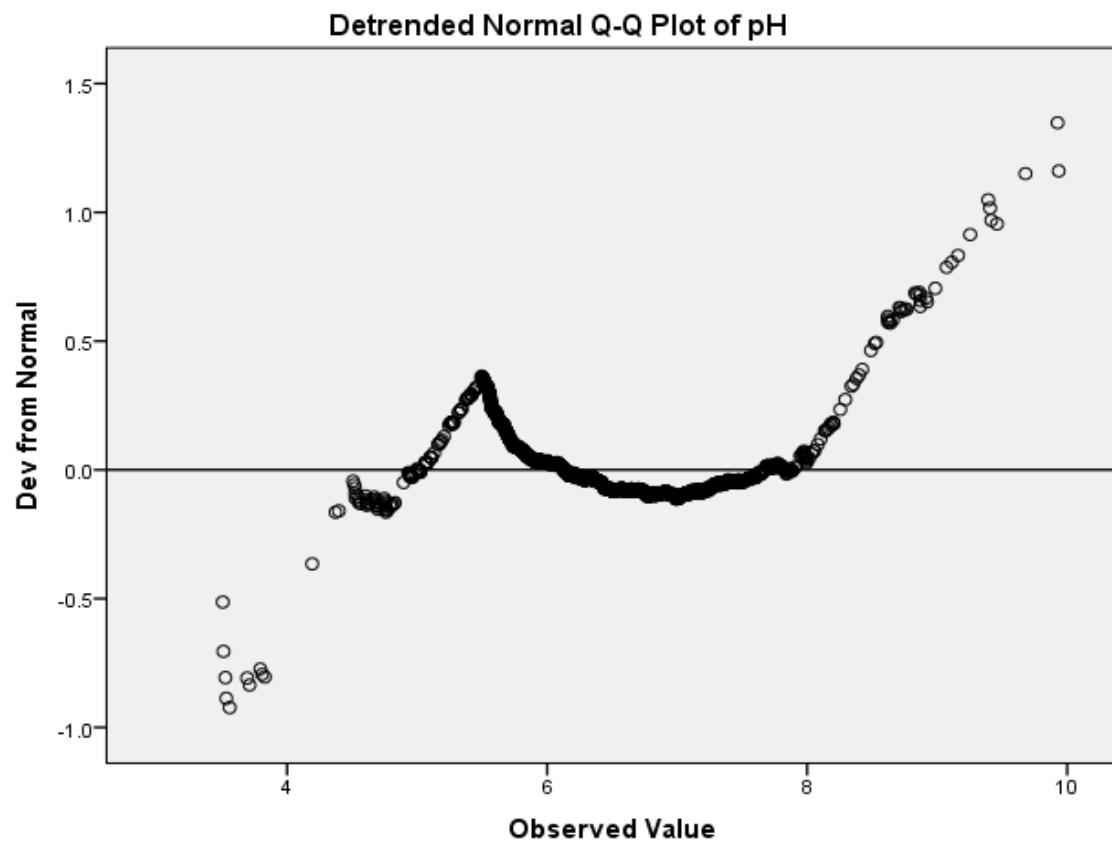
**Detrended Normal Q-Q Plot of Humidity**



**pH:**

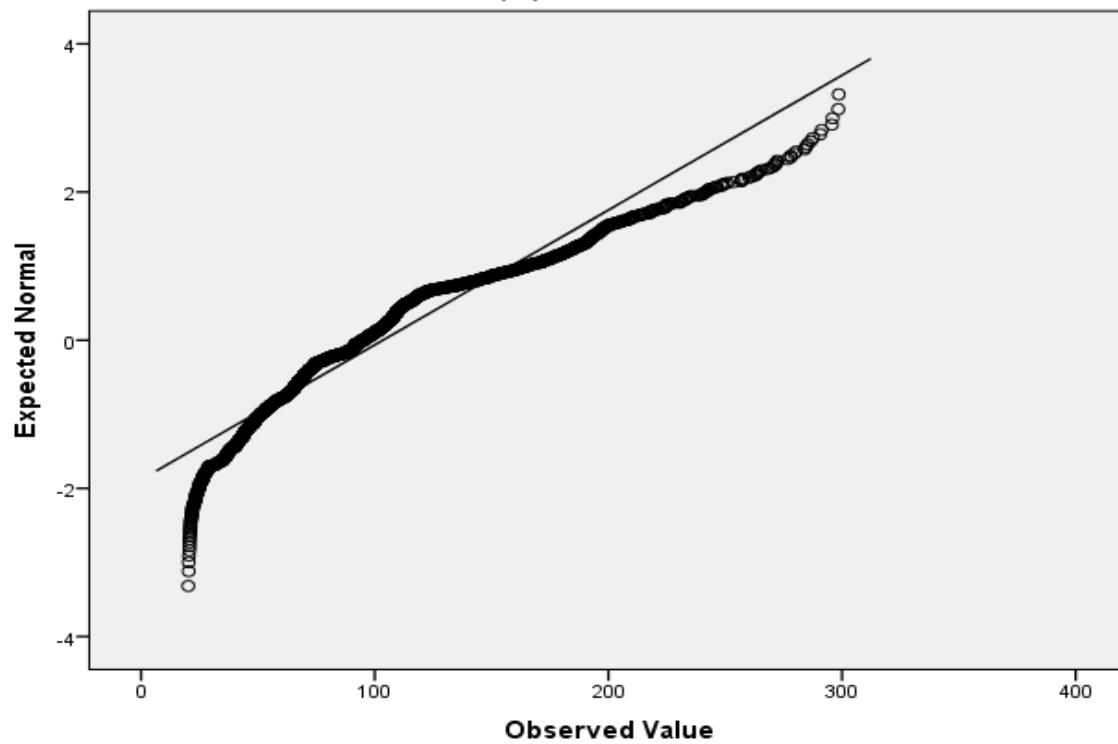
**Normal Q-Q Plot of pH**



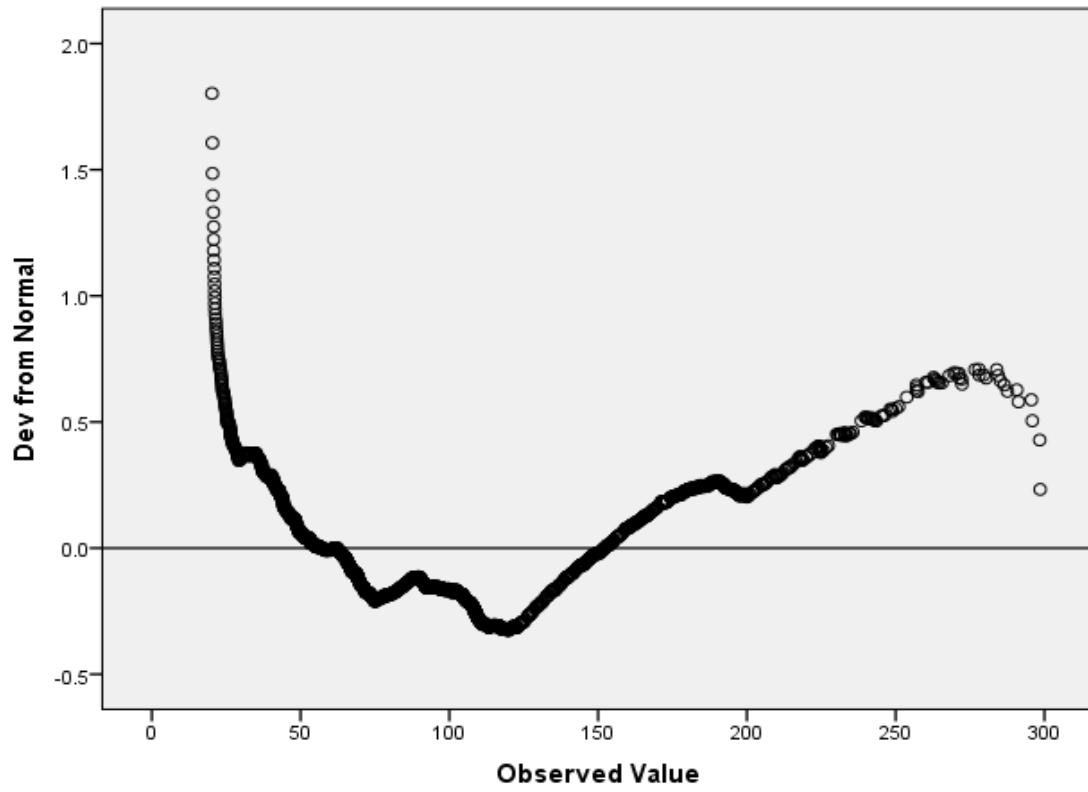


**Rainfall:**

**Normal Q-Q Plot of Rainfall**



**Detrended Normal Q-Q Plot of Rainfall**



## ડ નોન-પરામેટ્રિક ટેસ્ટ્સ:

One-Sample Kolmogorov-Smirnov Test								
		Nitrogen	Phosphorus	Potassium	Temperature	Humidity	pH	Rainfall
N		2200	2200	2200	2200	2200	2200	2200
Normal Parameters <sup>ab</sup>	Mean	50.5518	53.3627	48.1491	25.6162	71.4818	6.4695	103.4637
	Std. Deviation	36.91733	32.98588	50.64793	5.06375	22.26381	.77394	54.95839
Most Extreme Differences	Absolute	.173	.094	.310	.059	.172	.052	.119
	Positive	.173	.094	.310	.059	.123	.038	.119
	Negative	-.085	-.071	-.215	-.039	-.172	-.052	-.065
Kolmogorov-Smirnov Z		8.112	4.420	14.533	2.750	8.067	2.459	5.569
Asymp. Sig. (2-tailed)		.000	.000	.000	.000	.000	.000	.000
a. Test distribution is Normal.								
b. Calculated from data.								

- ડ Nitrogen: Not Normal
- ડ Phosphorus: Not Normal
- ડ Potassium: Not Normal
- ડ Temperature: Not Normal
- ડ Humidity: Not Normal
- ડ pH: Not Normal
- ડ Rainfall: Not Normal