

Table 4. Means of Plant height, No. of pods plant⁻¹, No. of seeds pod⁻¹ and pod length of cowpea as influenced by cutting system and K fertilizer application in two seasons and their combined.

Main effects and interactions	Plant height (cm)			No. of pods/ plant			No. of seeds/ pod			pod length (cm)			
	1 st season	2 nd season	Com.	1 st season	2 nd season	Com.	1 st season	2 nd season	Com.	1 st season	2 nd season	Com.	
Cutting system (C)													
Without cut (C1)	113.44	105.58	109.50	16.13	15.13	15.63	15.66	14.16	14.91	15.84	14.80	15.31	
After once cut (C2)	80.94	81.36	81.14	14.10	14.60	14.35	14.83	12.27	13.55	14.71	12.86	13.78	
After twice cut (C3)	70.00	62.91	66.45	11.34	12.23	11.78	11.66	8.22	9.94	11.09	8.48	9.78	
LSD 0.05	5.07	12.58	5.17	0.89	0.39	1.13	1.28	1.37	1.10	2.82	1.22	0.88	
Potassium fertilizer application (K)													
Control (K1)	86.11	78.50	82.30	10.73	12.28	11.50	11.00	8.22	9.60	13.16	10.30	11.73	
100% K as soil (K2)	88.77	82.66	85.71	13.88	13.88	13.88	12.77	10.11	11.44	13.77	11.53	12.64	
50% K+ foliar spray at flowering stage (K3)	89.11	86.05	87.57	14.00	14.33	14.16	15.00	12.22	13.60	14.30	12.02	13.15	
50% K+ foliar spray at flowering and pod filling stages (K4)	90.55	87.50	89.02	15.32	14.65	14.98	16.44	13.33	14.88	14.55	13.63	14.09	
25% K+ foliar spray at flowering stage (K5)	86.55	82.33	84.44	13.86	14.20	14.03	13.33	11.88	12.60	13.38	11.87	12.63	
25% K+ foliar spray at flowering and pod filling stages (K6)	87.66	82.66	85.16	15.36	14.58	14.97	15.77	13.55	14.66	14.11	12.92	13.51	
LSD 0.05	NS	NS	NS	0.78	0.56	0.49	1.05	1.07	0.51	NS	0.90	0.48	
Interaction (CXK)													
C1	K1	113.66	99.50	106.58	12.33	13.66	12.99	12.33	10.66	11.49	15.16	12.16	13.66
C1	K2	117.33	102.33	109.83	16.06	15.06	15.56	14.00	12.33	13.16	15.33	13.66	14.49
C1	K3	112.66	107.66	110.16	16.40	15.40	15.99	15.66	15.00	15.33	16.23	14.16	15.19
C1	K4	114.66	112.83	113.74	17.96	15.96	16.96	18.33	16.66	17.49	16.50	17.90	17.20
C1	K5	110.66	103.50	107.08	16.06	15.06	15.56	15.33	14.33	14.83	15.50	14.13	14.81
C1	K6	111.66	107.66	109.66	18.00	15.66	16.83	18.33	16.00	17.16	16.33	16.76	16.54
C2	K1	77.33	80.16	78.74	11.86	14.2	13.03	12.00	8.00	10.00	14.00	11.40	12.70
C2	K2	81.33	79.83	80.58	14.26	14.26	14.26	12.33	10.66	11.49	14.83	12.76	13.79
C2	K3	81.33	82.00	81.66	13.66	14.66	14.16	16.66	13.66	15.16	15.16	13.16	14.16
C2	K4	83.33	82.83	83.08	14.66	14.66	14.66	17.66	15.00	16.33	15.43	13.83	14.63
C2	K5	81.00	82.50	81.75	15.00	15.00	15.00	13.66	11.66	12.66	14.16	13.00	13.58
C2	K6	81.33	80.83	81.08	15.16	14.83	14.99	16.66	14.66	15.66	14.66	13.00	13.83
C3	K1	67.33	55.83	61.58	8.00	9.00	8.50	8.66	6.00	7.33	10.33	7.33	8.83
C3	K2	67.66	65.83	66.74	11.33	12.33	11.83	12.00	7.33	9.66	11.16	8.16	9.66
C3	K3	73.33	68.50	70.91	11.93	12.93	12.43	12.66	8.00	10.33	11.50	8.73	10.11
C3	K4	73.66	66.83	70.24	13.33	13.33	13.33	13.33	8.33	10.83	11.73	9.16	10.44
C3	K5	68.00	61.00	64.50	10.53	12.53	11.53	11.00	9.66	10.33	10.50	8.50	9.50
C3	K6	70.00	59.50	64.75	12.93	13.26	13.09	12.33	10.00	11.16	11.33	9.00	10.16
LSD 0.05		N.S	N.S	N.S	1.36	0.96	0.85	1.83	1.85	0.89	N.S	1.56	0.84

Table 5. Means of Weight of pods/ plant, 100 weight seed, harvest index and seed yield of cowpea as influenced by cutting system and K fertilizer application in two seasons and their combined.

Main effects and interactions	weight of pods/ plant (g)			100 weight seed (g)			harvest index			seed yield (kg)			
	1 st season	2 nd season	Com.	1 st season	2 nd season	Com.	1 st season	2 nd season	Com.	1 st season	2 nd season	Com.	
Cutting system (C)													
Without cut (C1)	26.30	27.25	26.77	15.03	15.10	15.06	0.35	0.33	0.34	575.54	505.29	540.41	
After once cut (C2)	24.15	26.55	25.35	14.40	14.48	14.44	0.35	0.34	0.34	527.35	480.21	503.77	
After twice cut (C3)	17.71	16.41	17.05	9.20	7.98	8.59	0.29	0.30	0.29	339.67	359.63	349.64	
LSD 0.05	1.37	1.97	2.11	1.49	1.66	0.85	0.008	0.017	0.016	38.06	29.59	53.10	
Potassium fertilizer application (K)													
Control (K1)	15.46	14.35	14.90	10.55	10.87	10.70	0.30	0.28	0.29	375.25	336.30	355.77	
100% K as soil (K2)	21.68	20.05	20.86	11.96	11.50	11.73	0.32	0.30	0.31	424.46	372.96	398.71	
50% K+ foliar spray at flowering stage (K3)	25.94	25.47	25.69	13.77	12.75	13.26	0.34	0.33	0.33	522.73	525.16	523.94	
50% K+ foliar spray at flowering and pod filling stages (K4)	27.86	28.51	28.18	14.61	13.70	14.15	0.35	0.36	0.35	565.06	543.86	554.46	
25% K+ foliar spray at flowering stage (K5)	20.95	23.80	22.37	12.53	12.75	12.64	0.33	0.33	0.33	479.74	442.06	460.89	
25% K+ foliar spray at flowering and pod filling stages (K6)	24.42	28.23	26.32	13.82	13.57	13.69	0.34	0.34	0.34	517.87	469.91	493.89	
LSD 0.05	1.07	1.52	1.45	0.87	1.00	0.45	0.012	0.011	0.01	27.79	21.99	17.22	
Interaction (CXK)													
C1	K1	19.68	19.68	19.68	12.77	13.77	13.27	0.31	0.29	0.30	419.96	387.78	403.87
C1	K2	23.84	22.16	23.00	13.87	13.87	13.87	0.35	0.31	0.33	501.32	418.76	460.04
C1	K3	30.13	27.84	28.98b	15.23	15.23	15.23	0.36	0.34	0.35	620.65	624.37	622.51
C1	K4	33.61	33.13	33.37	17.32	17.32	17.32	0.37	0.37	0.37	708.06	589.96	649.01
C1	K5	22.16	28.40	25.28	14.59	14.59	14.59	0.343	0.33	0.33	599.56	505.13	552.34
C1	K6	28.40	32.28	30.34	16.39	15.86	16.12	0.37	0.35	0.36	603.68	505.74	554.71
C2	K1	17.25	15.25	16.25	10.51	11.51	11.01	0.31	0.32	0.31	407.83	350.98	379.40
C2	K2	22.77	22.44	22.60	12.79	12.79	12.79	0.33	0.32	0.32	454.68	384.06	419.37
C2	K3	26.85	28.93	27.89	16.78	14.78	14.28	0.35	0.34	0.34	586.23	564.43	575.33
C2	K4	28.92	30.85	29.88	17.00	15.50	14.75	0.38	0.38	0.38	619.96	614.98	617.47
C2	K5	24.35	27.93	26.14	13.75	15.75	14.75	0.36	0.36	0.36	508.36	453.42	480.89
C2	K6	24.77	33.93	29.35	15.56	16.56	16.06	0.37	0.35	0.36	587.04	513.39	550.21
C3	K1	9.47	8.12	8.79	8.35	7.32	6.83	0.28	0.25	0.26	297.98	270.15	284.06
C3	K2	18.43	15.56	16.99	9.23	7.84	7.53	0.28	0.28	0.28	317.40	316.05	316.72
C3	K3	20.84	19.66	20.21	9.32	8.23	7.77	0.30	0.32	0.31	361.30	386.68	373.99
C3	K4	21.05	21.57	21.31	9.53	8.28	7.90	0.30	0.32	0.31	367.18	426.64	396.91
C3	K5	16.36	15.07	15.71	9.25	7.92	7.58	0.29	0.31	0.30	331.28	367.64	349.46
C3	K6	20.09	18.48	19.28	9.53	8.30	7.91	0.30	0.33	0.31	362.90	390.60	376.75
LSD 0.05		1.86	2.63	2.52	1.50	1.74	0.79	0.021	0.019	0.013	48.14	38.10	29.82

Table 6. Means of Germination%, seedling vigor index (1) and seedling vigor index (2) of cowpea as influenced by cutting system and K fertilizer application in two seasons and their combined.

Main effects and interactions		Germination (%)			Seedling vigor index (1)			Seedling vigor index (2)		
		1 st season	2 nd season	Com.	1 st season	2 nd season	Com.	1 st season	2 nd season	Com.
Cutting system (C)										
	Without cut (C1)	93.16	93.27	93.21	2052.63	2474.24	2263.43	6.30	8.71	7.50
	After once cut (C2)	95.05	90.11	92.58	2006.00	2219.86	2112.93	5.83	7.22	6.09
	After twice cut (C3)	85.61	80.44	83.02	1670.62	1728.53	1699.57	3.57	5.10	4.33
	LSD 0.05	4.028	5.267	3.383	68.934	140.693	206.817	1.086	1.083	1.262
Potassium fertilizer application (K)										
	Control (K1)	88.22	86.22	87.21	1675.31	1911.15	1793.23	3.73	5.28	4.15
	100% K as soil (K2)	91.11	86.66	88.88	1938.74	1979.21	1958.97	4.61	5.80	4.70
	50% K+ foliar spray at flowering stage (K3)	92.22	88.33	90.27	2096.90	2234.61	2165.75	6.03	8.65	7.34
	50% K+ foliar spray at flowering and pod filling stages (K4)	93.22	89.77	91.49	2092.00	2424.15	2258.07	6.79	9.39	8.09
	25% K+ foliar spray at flowering stage (K5)	89.88	87.55	88.72	1751.56	2077.58	1914.57	4.92	6.07	5.49
	25% K+ foliar spray at flowering and pod filling stages (K6)	93.00	89.11	91.05	1903.99	2218.57	2061.27	5.30	6.88	6.07
	LSD 0.05	2.666	NS	0.880	59.907	92.659	116.108	0.771	0.644	0.973
Interaction (C×K)										
C1	K1	89.33	92.33	90.83	1797.90	2123.78	1960.84	4.14	5.54	4.84
C1	K2	93.33	92.66	92.99	2195.43	2141.83	2168.63	4.68	6.48	5.58
C1	K3	94.00	93.66	93.83	2488.49	2689.45	2588.97	7.94	12.17	10.05
C1	K4	95.00	94.00	94.50	2416.16	2967.01	2691.58	9.46	13.46	11.46
C1	K5	92.00	9.00	92.50	1714.69	2341.28	2027.98	5.52	6.82	6.17
C1	K6	95.33	94.00	94.66	1703.11	2582.09	2142.60	6.03	7.83	6.93
C2	K1	91.33	86.66	88.99	1754.97	2005.93	1880.45	3.40	6.33	3.81
C2	K2	96.00	86.66	91.33	2117.51	2132.26	2124.88	6.08	6.36	4.72
C2	K3	96.00	90.00	93.00	1910.67	2250.00	2080.33	6.40	8.10	7.25
C2	K4	97.33	94.00	95.66	2049.66	2455.43	2252.54	7.14	8.48	7.81
C2	K5	92.66	90.00	91.33	1796.12	2193.80	1994.96	5.85	6.60	6.22
C2	K6	97.00	93.33	95.16	2407.09	2281.73	2344.41	6.13	7.46	6.76
C3	K1	84.00	79.66	81.83	1473.07	1603.73	1538.40	3.66	3.98	3.82
C3	K2	84.00	80.66	82.33	1503.28	1663.54	1583.41	3.07	4.57	3.82
C3	K3	86.66	81.33	83.99	1891.553	1764.40	1827.97	3.75	5.69	4.72
C3	K4	87.33	81.33	84.33	1810.19	1850.01	1830.10	3.78	6.24	5.01
C3	K5	85.00	79.66	82.33	1743.88	1697.66	1720.77	3.40	4.78	4.09
C3	K6	86.66	80.00	83.33	1601.77	1791.88	1696.82	3.75	5.34	4.54
LSD 0.05		NS	NS	1.525	103.76	160.490	201.105	1.336	1.115	1.685

Table 7. Means of Shoot and radical lengths and fresh and dry weight of seedlings of cowpea as influenced by cutting system and K fertilizer application in two seasons and their combined.

Main effects and interactions	Shoot Length(cm)		Radical length(cm)			Fresh weight of seedling (g)			Dry weight of seedling (g)				
	1 st season	2 nd season	Com.	1 st season	2 nd season	Com.	1 st season	2 nd season	Com.	1 st season	2 nd season	Com.	
Cutting system (C)													
Without cut (C1)	16.70	21.29	18.99	5.30	5.21	5.25	4.04	3.81	3.92	0.06	0.09	0.07	
After once cut (C2)	16.41	19.49	17.94	4.65	5.12	4.88	3.67	3.61	3.63	0.06	0.08	0.06	
After twice cut (C3)	14.98	17.53	16.25	4.51	3.95	4.23	2.40	3.18	2.78	0.04	0.06	0.04	
LSD 0.05	1.128	0.744	1.201	0.279	0.508	0.584	1.099	0.464	0.609	0.006	0.009	0.005	
Potassium fertilizer application (K)													
Control (K1)	14.53	17.94	16.23	4.42	4.15	4.28	2.13	2.49	2.31	0.04	0.06	0.05	
100% K as soil (K2)	16.57	18.34	17.45	4.58	4.44	4.51	2.40	2.88	2.63	0.05	0.06	0.05	
50% K+ foliar spray at flowering stage (K3)	17.51	20.04	18.78	5.21	5.08	5.14	3.98	3.97	3.97	0.06	0.09	0.07	
50% K+ foliar spray at flowering and pod filling stages (K4)	17.16	21.41	19.28	5.25	5.40	5.32	4.61	4.46	4.53	0.07	0.10	0.08	
25% K+ foliar spray at flowering stage (K5)	14.78	18.96	16.86	4.72	4.66	4.68	3.03	3.49	3.26	0.05	0.06	0.05	
25% K+ foliar spray at flowering and pod filling stages (K6)	15.64	19.93	17.78	4.74	4.84	4.79	4.06	3.90	3.98	0.05	0.07	0.06	
LSD 0.05	1.128	0.601	1.150	0.292	0.464	0.147	0.483	0.464	0.253	0.006	0.006	0.005	
Interaction (CXK)													
C1	K1	15.17	18.47	16.82	4.94	4.53	4.73	2.04	2.31	2.17	0.04	0.06	0.05
C1	K2	18.44	18.41	18.42	5.09	4.71	4.90	2.29	2.52	2.40	0.05	0.07	0.06
C1	K3	20.58	23.28	21.93	5.90	5.43	5.66	5.00	4.59	4.79	0.08	0.13	0.10
C1	K4	19.51	25.58	22.54	5.91	6.00	5.95	6.26	5.11	5.68	0.10	0.14	0.12
C1	K5	13.63	19.89	16.76	4.99	5.27	5.13	3.70	3.79	3.74	0.06	0.07	0.06
C1	K6	12.90	22.14	17.52	4.96	5.32	5.14	4.97	4.56	4.76	0.06	0.08	0.07
C2	K1	14.63	18.50	16.56	4.58	4.64	4.61	2.62	3.01	2.81	0.06	0.07	0.06
C2	K2	17.35	19.68	18.51	4.69	4.93	4.81	2.93	3.51	3.22	0.06	0.07	0.06
C2	K3	15.16	19.56	17.36	4.72	5.44	5.08	4.20	3.59	3.89	0.06	0.09	0.07
C2	K4	16.29	20.39	18.34	4.75	5.72	5.23	4.39	4.21	4.30	0.07	0.09	0.08
C2	K5	14.84	19.55	17.19	4.54	4.83	4.68	3.04	3.65	3.34	0.06	0.07	0.06
C2	K6	20.19	19.24	19.71	4.62	5.18	4.90	4.81	3.72	4.26	0.06	0.08	0.07
C3	K1	13.80	16.84	15.32	3.74	3.28	3.51	1.74	2.17	1.95	0.03	0.05	0.04
C3	K2	13.93	16.94	15.43	3.96	3.68	3.82	1.97	2.62	2.29	0.04	0.05	0.04
C3	K3	16.81	17.3	17.05	5.02	4.39	4.70	2.74	3.74	3.24	0.04	0.06	0.05
C3	K4	15.67	18.26	16.96	5.09	4.48	4.78	3.17	4.07	3.62	0.04	0.07	0.05
C3	K5	15.86	17.45	16.65	4.63	3.87	4.25	2.36	3.05	2.70	0.04	0.06	0.05
C3	K6	13.84	18.40	16.12	4.63	4.03	4.33	2.42	3.42	2.92	0.04	0.06	0.05
LSD 0.05		1.666	1.041	1.992	0.505	NS	0.255	0.837	0.771	0.439	0.010	0.011	0.009

Table 8. Estimates of costs for inputs farm operation and economic return of fodder cowpea as affected by cutting system and Potassium fertilizer application for the forage and seed yields across the two growing seasons.

Costs and production inputs	Treatments					
	Seed production: without cut					
	K1	K2	K3	K4	K5	K6
Total variable cost	7048	7448	7323	7398	7223	7298
Total revenue for forage Yield L.E fad. ⁻¹	-	-	-	-	-	-
Total revenue for seed yield L.E. fad. ⁻¹	8077	9200	12450	12980	11046	11094
Total revenue for forage and seed yields L.E fad. ⁻¹	8077	9200	12450	12980	11046	11094
Net return L.E.	179.4	502.8	4002.2	4532.2	2873.8	2846.2
Return invested L.E.	1.02	1.05	1.48	1.53	1.35	1.34
Net Return of invested L.E.	0.02	0.05	0.48	0.53	0.35	0.34
	Seed production: after once cut					
	K1	K2	K3	K4	K5	K6
Total variable cost	7048	7448	7323	7398	7223	7298
Total revenue for forage Yield L.E fad. ⁻¹	3664	4608	4596	4596	4544	4544
Total revenue for seed yield L.E. fad. ⁻¹	7588	8387	11506	12349	9617	11004
Total revenue for forage and seed yields L.E fad. ⁻¹	11252	12995	16102	16945	14161	15548
Net return L.E.	4204	5547	8779	9547	6938	8250
Return invested L.E.	1.59	1.74	2.19	2.29	1.96	2.13
Net Return of invested L.E.	0.59	0.74	1.19	1.29	0.96	1.13
	Seed production: after twice cut					
	K1	K2	K3	K4	K5	K6
Total variable cost	7048	7448	7323	7398	7223	7298
Total revenue for forage Yield L.E fad. ⁻¹	5024	6020	5976	5976	5908	5908
Total revenue for seed yield L.E. fad. ⁻¹	5681	6334	7479	7938	6989	7535
Total revenue for forage and seed yields L.E fad. ⁻¹	10705	12354	13455	13914	13914	13443
Net return L.E.	3657	4906	6132	6516	6691	6145
Return invested L.E.	1.51	1.65	1.83	1.88	1.92	1.84
Net Return of invested L.E.	0.51	0.65	0.83	0.88	0.92	0.84

Where: K1 Control (no fertilizer), K2 100% K as soil application (48 kg Kfad⁻¹), K3 50% K as soil application (24 kg Kfad⁻¹) + K foliar spray application at flowering, K4 50% K as soil application (24 kg Kfad⁻¹) + K foliar spray applications at flowering and pod filling stages, K5 25 % K as soil application (12 kg Kfad⁻¹) + K foliar spray application at flowering, K6 25 % K as soil application (12 kg K fad⁻¹) + K foliar spray applications at flowering and pod filling stages

Net return (L.E. fad⁻¹) = Total revenue - Total variable cost Return of invested = Total revenue / Total variable cost

Net return of invested L.E.= Return of invested L.E