Table(1): Physical and chemical properties of soil used for growing cumin at El- Kowsar, Sohag

Properties	Gravel %	S.P[A] %	Particle size analysis			pH 1:1	ECe	Soluble cations (meq/l)*			
			Sand %	Silt %	Caly %			Na^{+1}	K^{+1}	Ca^{+2}	Mg^{+2}
Mean	35.96	31.23	70.27	18.42	11.29	8.63	1.44	0.96	0.46	8.12	5.21
Properties	Soluble anions (meq/l)			O.M[B] %	$CaCO_3$ %	N %	P ppm	S. K[C] ppm	Micronutrients ppm[D]			
	Cl^{-1}	HCO_3^{-1}	SO_4^{-2}						Fe	Mn	Zn	Cu
Mean	5.57	4.94	3.92	1.12	52.62	0.07	17.36	5.87	3.9	11.1	1.2	1.0

A:Water saturation percentage, B: Organic matter, C: Soluble-K, D: DTPA-extractable µnutrients

* In the soil paste extract, ** Results were reported by Moustafa (2006

Table(2): Effect of irrigation intervals and seeds biological treatments on plant survive and seeds yield of cumin plants grown organically in new sandy reclaimed soil naturally infested by *F. oxysporum* f. sp. *cumini*

Treatments		2006/2007 season						2007/2008 season					
Irrigation intervals	Biological treatments	No. of plants / plot	Surv-ive (%)	No. of umbels/ plant	Seeds / 10 plants (g)	Seeds / plot(g)	Seeds / feddan (kg)	No. of plants / plot	Surv-ive (%)	No. of umbels / plant	Seeds / 10 plants (g)	Seeds / plot(g)	Seeds / feddan (kg)
2 weeks	Control	37.0	51.4	38.7	100.1	390.4	273.3	43.9	60.9	40.6	105.1	470.0	329.0
	Chitosan	72.0	100.0	27.0	88.2	670.4	469.3	72.0	100.0	24.8	92.6	688.3	481.8
	Streptomyces	72.0	100.0	23.2	22.1	171.0	119.7	72.0	100.0	24.3	23.2	172.0	120.4
	Bion	58.5	81.3	15.8	30.3	191.2	133.8	64.7	89.8	16.6	31.9	211.2	147.9
4 weeks	Control	45.0	62.5	22.7	52.4	251.0	175.7	49.4	68.6	23.8	55.0	277.6	194.3
	Chitosan	50.5	70.1	12.3	19.3	95.6	67.0	59.1	82.1	13.0	20.3	119.8	83.8
	Streptomyces	71.5	99.3	7.2	14.3	102.7	71.9	72.0	100.0	7.5	15.0	108.0	75.6
	Bion	56.5	78.5	18.3	55.3	294.7	206.3	57.5	79.9	19.3	58.1	328.7	230.1
8 weeks	Control	38.0	52.8	17.8	26.5	105.7	74.0	41.3	57.4	18.7	27.8	116.9	81.8
	Chitosan	63.0	87.5	15.5	85.0	529.2	370.4	66.2	91.9	16.3	89.3	589.6	412.7
	Streptomyces	51.5	71.5	7.5	8.3	40.3	28.2	60.2	83.6	7.9	8.7	51.9	36.3
	Bion	48.0	66.7	10.3	16.4	70.8	49.6	41.1	57.1	10.9	17.2	67.8	47.4
Means of irrigation intervals	2 weeks	59.9	83.2	26.2	60.2	355.7	249.0	63.1	87.7	26.6	63.2	385.4	269.8
	4 weeks	55.9	77.6	15.1	35.3	186.0	130.2	59.5	82.7	15.9	37.1	208.5	146.0
	8 weeks	50.1	69.6	12.8	34.0	186.5	130.5	52.2	72.5	13.4	35.7	206.5	144.6
Means of biological treatments	Control	40.0	55.6	26.4	59.6	249.0	174.3	44.9	62.3	27.7	62.6	288.1	201.7
	Chitosan	61.8	85.9	18.3	64.2	431.7	302.2	65.8	91.3	18.0	67.4	465.9	326.1
	Streptomyces	65.0	90.3	12.6	14.9	104.7	73.3	68.1	94.5	13.2	15.6	110.6	77.4
	Bion	54.3	75.5	14.8	34.0	185.6	129.9	54.4	75.6	15.6	35.7	202.6	141.8
LSD (5%)	Irrigation intervals	*7.3*	*10.1*	*3.1*	*14.7*	*107.4*	*74.9*	*5.2*	*7.3*	*0.8*	*2.2*	*37.4*	*26.0*
	Biological treatments	*8.4*	*11.7*	*3.6*	*17.0*	*124.5*	*86.5*	*6.1*	*8.4*	*0.9*	*2.6*	*43.5*	*30.0*
	Irrigation x Treatments	*14.6*	*20.2*	*6.2*	*29.4*	*214.4*	*149.8*	*10.5*	*14.6*	*1.6*	*4.5*	*74.5*	*51.9*

Table(3): Effect of irrigation intervals and seeds biological treatments on vegetative growth parameters of cumin plants grown organically in new sandy reclaimed soil naturally infested by *F. oxysporum* f. sp. *cumini*

Treatments		2006/2007 season						2007/2008 season					
Irrigation intervals	Biological treatments	Stem height (cm)	Root length (cm)	Plant height (cm)	Stem diameter (cm)	No. of branches / plant	Plant D. W. (g)	Stem height (cm)	Root length (cm)	Plant height (cm)	Stem diameter (cm)	No. of branches /plant	Plant D. W. (g)
2 weeks	Control	32.0	6.5	38.5	2.8	9.3	0.94	35.0	5.4	40.4	2.9	7.7	0.99
	Chitosan	29.5	7.2	36.7	2.5	8.8	1.06	31.0	7.5	38.5	2.6	8.0	1.12
	Streptomyces	22.8	5.8	28.6	2.2	8.0	0.36	21.3	4.9	26.2	2.3	8.4	0.37
	Bion	25.4	5.4	30.8	2.1	6.7	0.56	25.9	6.6	32.5	2.5	8.0	0.93
4 weeks	Control	25.4	5.1	30.5	2.0	9.3	0.58	20.9	4.3	25.2	2.0	9.8	0.61
	Chitosan	21.3	5.3	26.6	1.6	6.5	0.22	26.3	6.2	32.5	1.7	9.1	0.23
	Streptomyces	17.8	4.2	22.0	1.4	5.2	0.16	18.7	4.4	23.1	1.4	5.4	0.17
	Bion	27.3	7.0	34.3	2.5	8.5	0.72	28.7	7.4	36.1	2.7	8.9	0.76
8 weeks	Control	28.3	5.0	33.3	2.0	7.2	0.50	30.1	4.9	35.0	2.1	6.2	0.52
	Chitosan	25.2	5.8	31.0	1.8	6.5	0.44	29.5	6.4	35.9	2.6	6.8	0.46
	Streptomyces	17.6	4.4	22.0	1.3	4.5	0.13	18.5	4.6	23.1	1.3	4.7	0.14
	Bion	20.7	5.2	25.8	1.7	5.8	0.13	21.7	5.4	27.1	1.8	6.1	0.14
Means of irrigation intervals	2 weeks	27.4	6.2	33.6	2.4	8.2	0.73	28.3	6.1	34.4	2.6	8.0	0.85
	4 weeks	23.0	5.4	28.4	1.9	7.4	0.42	23.7	5.6	29.3	2.0	8.3	0.44
	8 weeks	22.9	5.1	28.0	1.7	6.0	0.30	25.0	5.3	30.3	2.0	6.0	0.31
Means of biological treatments	Control	28.6	5.5	34.1	2.3	8.6	0.67	28.7	4.9	33.6	2.4	7.9	0.70
	Chitosan	25.3	6.1	31.4	2.0	7.3	0.57	28.9	6.7	35.6	2.3	8.0	0.60
	Streptomyces	19.4	4.8	24.2	1.6	5.9	0.22	19.5	4.6	24.1	1.7	6.2	0.23
	Bion	24.5	5.9	30.4	2.1	7.0	0.47	25.4	6.5	31.9	2.3	7.7	0.61
LSD (5%)	Irrigation intervals	*1.9*	*0.7*	*2.4*	*0.2*	*0.8*	*0.10*	*1.5*	*0.3*	*1.7*	*0.1*	*0.5*	*0.06*
	Biological treatments	*2.2*	*0.8*	*2.7*	*0.3*	*0.9*	*0.11*	*1.7*	*0.4*	*2.0*	*0.2*	*0.6*	*0.06*
	Irrigation x Treatments	*3.8*	*1.4*	*4.7*	*0.5*	*1.6*	*0.20*	*3.0*	*0.7*	*3.4*	*0.3*	*1.0*	*0.11*