

***k*-Oligocarrageenan promoting growth of hybrid maize:**

Influence of molecular weight.

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Supplementary Data

Table S1. Meteorological data for each month in Daklak province, Vietnam collected in two years 2018 and 2019 collected by the Tay Nguyen regional hydrometeorological center.

Month	2018		2019	
	Rainfall	Temp.	Rainfall	Temp.
	(mm)	(°C)	(mm)	(°C)
1	-	22.0	25.4	21.9
2	-	22.0	1.6	21.8
3	33.1	24.7	7.0	24.1
4	105.1	26.1	106.3	25.8
5	204.1	26.3	346.7	25.7
6	228.4	25.9	208.4	25.2
7	238.0	24.9	222.0	24.8
8	298.7	25.5	165.0	24.5
9	391.0	25.3	194.8	24.7
10	22.3	24.4	198.1	24.6
11	87.2	24.0	100.0	23.8
12	22.7	21.4	47.0	23.4

Table S2. Influence of molecular weight of oligocarrageenan on maize plant height and maize ear in two years

Treatments	Plant height (cm)			Maize ear size (cm)	
	25 days	40 days	60 days	Length	Diameter
2018					
Control (water)	48.84 ^a	159.56 ^a	176.58 ^a	17.62 ^a	4.16 ^a
42 kDa	48.23 ^a	175.70 ^b	194.58 ^b	18.72 ^a	4.46 ^a
17 kDa	48.32 ^a	169.20 ^b	193.01 ^b	17.85 ^a	4.41 ^a
4 kDa	52.20 ^b	184.06 ^c	211.69 ^c	20.62 ^b	5.02 ^b
CV (%)	3.42	2.02	1.98	3.14	4.09
LSD, 0.05	3.04	6.24	6.90	1.05	0.33
2019					
Control (water)	48.07 ^a	155.90 ^a	176.03 ^a	17.21 ^a	4.38 ^a
42 kDa	49.02 ^{ab}	176.22 ^b	194.40 ^b	18.47 ^b	4.62 ^c
17 kDa	49.31 ^{ab}	167.68 ^c	191.52 ^b	18.18 ^b	4.52 ^b

4 kDa	50.83 ^b	183.74 ^d	212.33 ^c	19.32 ^c	4.78 ^d
CV (%)	2.19	1.38	1.10	0.88	1.00
LSD, 0.05	1.94	4.23	3.83	0.29	0.08

Different letters indicate significant differences (P < 0.05).

Table S3. Influence of molecular weight of oligocarrageenan on parameters of ear growth and crop yield.

Treatments	Number of rows per ear	Number of grains per row	Number of grains per ear	Fresh grains weight (g)	Dry grains weight (g)	Grain yield (kg ha⁻¹)
2018						
Control (water)	11.51 ^a	32.73 ^a	398.30 ^a	125.68 ^a	107.16 ^a	5329
42 kDa	11.50 ^a	36.03 ^c	446.83 ^b	134.66 ^b	116.02 ^b	5770
17 kDa	11.64 ^a	35.26 ^b	444.54 ^b	138.14 ^b	121.10 ^b	6022
4 kDa	12.31 ^b	35.63 ^{bc}	471.32 ^c	148.03 ^c	128.63 ^c	6397
CV (%)	2.56	1.03	2.16	1.82	2.92	
LSD _{0.05}	0.54	0.65	17.06	4.48	6.19	
2019						
Control (water)	11.78 ^a	33.26 ^a	413.06 ^a	125.31 ^a	106.97 ^a	5235
42 kDa	11.78 ^a	36.48 ^b	453.15 ^b	135.85 ^b	117.04 ^b	5727
17 kDa	11.97 ^a	35.91 ^b	450.77 ^b	139.36 ^b	122.17 ^c	5978

4 kDa	12.54 ^b	36.29 ^b	478.04 ^c	149.34 ^c	129.77 ^d	6350
CV (%)	2.08	1.00	1.12	1.72	1.06	
LSD _{0.05}	0.45	0.63	9.03	4.24	2.27	

Different letters indicate significant differences (P < 0.05).

Table S4. Influence of molecular weight of oligocarrageenan on NPK uptakes (kg ha⁻¹) by maize plant in two years

Treatments	Leaves			Trunk			Grains		
	N	P ₂ O ₅	K ₂ O	N	P ₂ O ₅	K ₂ O	N	P ₂ O ₅	K ₂ O
2018									
Control (water)	53.81 ^a	9.49 ^a	60.01 ^a	18.53 ^a	4.33 ^a	83.97 ^a	129.50 ^a	103.34 ^a	65.03 ^a
42 kDa	60.12 ^{ab}	9.84 ^a	64.98 ^a	18.73 ^a	4.65 ^{ab}	86.93 ^a	145.88 ^b	118.03 ^b	70.03 ^{ab}
17 kDa	64.75 ^b	10.75 ^b	66.29 ^a	20.15 ^{ab}	5.18 ^{bc}	92.68 ^a	138.32 ^{ab}	110.61 ^{ab}	71.87 ^b
4 kDa	68.70 ^b	10.95 ^b	74.30 ^b	21.95 ^b	5.53 ^b	96.77 ^a	142.92 ^{ab}	114.69 ^b	66.68 ^{ab}
CV (%)	7.42	2.77	5.04	5.19	6.74	11.39	4.95	4.49	4.86
LSD, _{0.05}	8.24	0.51	6.01	1.85	0.60	18.42	12.38	9.01	5.97
2019									
Control (water)	59.55 ^a	10.07 ^a	63.10 ^a	19.01 ^a	4.45 ^a	84.82 ^a	131.74 ^a	105.58 ^a	66.71 ^a
42 kDa	64.46 ^{ab}	10.72 ^{ab}	70.80 ^{ab}	19.43 ^{ab}	4.69 ^{ab}	87.23 ^a	142.79 ^{ab}	115.76 ^b	67.81 ^a
17 kDa	71.01 ^{bc}	12.19 ^c	72.41 ^b	21.19 ^b	5.22 ^b	97.30 ^{ab}	146.10 ^b	116.84 ^b	70.10 ^a
4 kDa	76.10 ^c	10.94 ^b	75.61 ^b	24.36 ^c	5.25 ^b	109.56 ^b	161.43 ^c	124.92 ^b	72.59 ^a

CV (%)	8.60	3.51	6.69	5.67	8.03	11.90	5.65	5.61	6.86
LSD, 0.05	10.47	0.69	8.47	2.14	0.71	20.25	14.78	11.66	8.53

Different letters indicate significant differences (P < 0.05).