

Field Test Report on Seaweed Extract Powder

Seaweed extract powder

China patent no.: 03112663.6

Product character:

Black or brown powder, water soluble, pH=8-10

Main ingredient:

Alginic Acid: 8-15%, organic matter \geq 50%, N \geq 0.5%, P₂O₅ \geq 3.0%, K₂O:18-22%.

Efficacy:

Improve crop's quality, enhance resistance of crops, induce plants to enhance resistance to disease, meliorate soil, increase yield for 15 to 30%.

The greatest advantage of this kind of fertilizer is its good water-solubility, and application to spray and irrigation. Because it is powder form, transportation is very convenient. But the protection against moisture should be noted.

Test bases are set up in Qingdao Jimo National Agricultural High-tech Development Zone ("Park" for short). And field test is proceeded according to the standard stated in *Technical Rules of Field Test On Fertilizer Effect* (NY/T497-2002).

In this test, Seaweed Extract Power shows a distinct advantage in increasing yield:

1. Effect on cabbage in early spring.

To test with 3 treatments: A. Seaweed Extract Powder B. Common contrast C. Water contrast

To dilute it with water for 1500-2000 times and spray once in seedling stage, fruit swelling stage and heading stage of the cabbage. The balling is sturdy. The average weight per plant is 3.57KG, and the largest plant weighs 4.75KG. The output per hectare is 142,800 KG (40,000 plants per hectare, with the row spacing of 50CM \times 50CM). The yield increased by 18.6% than that of water contrast area (see form 1).

Seaweed Extract Powder's Effect on Cabbage

Form 1

Treatment	Weight Per Plant (KG/Plant)	Yield of Test Area (KG/30 m ²)	Computative of per ha (KG)	Comparing to C+ %	Note
A. Seaweed Extract Powder	3.57	428.4	142,800	18.6	
B. Common	3.27	392.4	130,800.-	8.6	
C. Water	3.01	361.2	120,400.-	-----	

2. Effect on cucumber

To test with 3 treatments: A. Seaweed Extract Powder B. Common contrast C. Water contrast

To apply in the seedling stage, flowering stage and early fruiting stage with dilution with water for 2000 times. To apply every 7-10 days. Benefit bud differentiation. The leaves and cucumbers are in deep green, and taste is fresh and sweet. The yield increased by 19.2% than that of the contrast area (see form 2).

Seaweed Extract Powder's Effect on Cucumber

Form 2

Treatment	Yield of Test Area (KG/40 m ²)	Computative of per ha (KG)	Comparing to C+ %	Note
A. Seaweed Extract Powder	410	102,500.-	19.2	
B. Common	373	93,250.-	8.4	
C. Water	344	86,000.-	-----	

3. Effect on Vegetable Marrow (see form 3)

Seaweed Extract Powder's Effect on Vegetable Marrow

Form: 3

Treatment	Yield of Test Area (KG/30 m ²)	Computative of per ha (KG)	Increasing rate comparing to C-water %	Note
A. Seaweed Extract Powder	186	62,000.-	20.0	
B. Common	165	55,000.-	6.45	
C. Water	155	51,667.-	-----	

4. Effect on tomato (large tomato) (see form 4)

Seaweed Extract Powder's Effect on Tomato

Form: 4

Treatment	Yield of Test Area (KG/40 m ²)	Computative of per ha (KG)	Increasing rate comparing to C-water %	Note
A. Seaweed Extract Powder	52	13,000.-	15.6	
B. Common	49	12,250.-	8.9	
C. Water	45	11,250.-	-----	

5. Celery

The test is in the sunlight greenhouse.

To test with 3 treatments: A. Seaweed Extract Powder B. Common contrast C. Water contrast Repeat 3 times. To spray with dilution with water for 1500-2000 times, 1-1.5kg/ha. To spray 4 times (from the seedling stage on April 24th until 7days before harvest), and apply every 10-15 days.

The yield of fertilized area increases by 13.1% than that of water contrast area, and 7.0% than that of common contrast area (see form 5). Tested by LSR, the differences between Seaweed Extract Powder water contrast area is prominent.

Form 5 Seaweed Extract Powder's Effect on Celery

Treatment	Yield of Test Area (KG/20 m ²)			Total	Average (KG/20 m ²)	Computative of per ha (KG)	Comparison %	
	I	II	III				Comparing to B	Comparing to C
A	145	137	133	415	138	69000	7.0	13.1
B	135	123	128	386	129	64500	—	5.7
C	122	117	127	366	122	61000	—5.4	—

6. Ball cabbage

This test is proceeded in the ball cabbage field.

To test with 3 treatments: A. Seaweed Extract Powder B. Common contrast C. Water contrast Repeat 3 times. To spray with dilution with water for 1500-2000 times, 1-1.5 kg/ha. To spray 3 times (in the seedling stage, early heading stage and middle and late stages), and apply every 10-15 days.

The yield of fertilized area increases by 14.88% than that of water contrast area, and 7.34% than that of common contrast area (see form 6). Tested by LSR, the differences between Seaweed Extract Powder area and water contrast area is prominent .

Form 6 Effect of Seaweed Extract Powder on Yield of Ball Cabbage

Treatment	Yield of Test Area (KG/40 m ²)			Total	Average (KG/40 m ²)	Computative of per ha (KG)	Comparison %	
	I	II	III				Comparing to B	Comparing to C
A	280	276	277	833	278	69500	7.34	14.88
B	263	255	259	777	259	64750	—	7.02
C	243	245	239	727	242	60500	—6.56	—

7. Tomato

This test is proceeded in the sunlight greenhouse of the garden.

To test with 3 treatments: A. Seaweed Extract Powder B. Common contrast C. Water contrast Repeat 3 times. To spray with dilution with water for 1500-2000 times, 1-1.5 kg/ha. To spray started from the seedling stage (22/1), and then in the flowering stage and fruiting stage spray totally 8 times (apply every 10-15 days).

The yield of fertilized area increases by 13.3% than that of water contrast area, and 6.7% than that of common contrast area (see form 7)

Form 7 Effect of Seaweed Extract Powder r on Yield of Tomato

Treatment	Yield of Test Area (KG/40 m ²)			Total	Average (KG/40 m ²)	Computative of per ha (KG)	Comparison %	
	I	II	III				Comparing to B	Comparing to C
A	473	499	463	1435	478	119,500	6.7	13.3
B	459	446	440	1345	448	112,000	—	6.2
C	450	408	408	1266	422	105,500	—5.8	—

8. Watermelon

To test with 3 treatments: A. Seaweed Extract Powder B. Common contrast C. Water contrast Repeat 3 times with the teat area of 30m². To spray with dilution with water for 1500-2000 times, 1-1.5 kg/ha. To spray started from the seedling stage, and then in the vine-extending stage flowering stage, fruiting stage and fruit-swelling stage spray totally 5 times (apply every 10-15 days)

The yield of fertilized area increases by 19.6% than that of water contrast area, and 9.9% than that of common contrast area (see form 8). Tested by LSR, the differences between Seaweed Extract Powder area and water contrast area is prominent.

Form 8 Effect of Seaweed Extract Powder on Yield of Watermelon

Treatment	Yield of Test Area (KG/30 m ²)			Total	Average (KG/30 m ²)	Computative of per ha (KG)	Comparison %	
	I	II	III				Comparing to B	Comparing to C
A	240	256	237	733	244	81333	9.9	19.6
B	226	229	210	665	222	74000	—	8.8
C	203	217	193	613	204	68000	—8.1	—

9. Wheat

To test with 3 treatments: A. Seaweed Extract Powder B. Common contrast C. Water contrast Repeat 3 times with the teat area of 30m². To spray started from the seedling stage (on April 2nd), and then in the jointing stage, heading stage, and late flowering stage spray totally 4 times. To spray with dilution with water for 1500-2000 times, 1-1.5 kg/ha.

The yield of area A increases by 15.43% than that of water contrast area, and thousand kernel weight increases 4.9g (see form 9). Tested by LSR, the differences is highly significant.

Form 9 Effect of Seaweed Extract Powder on Yield of Wheat

Variety	Treatment	Yield of Test Area (KG/30 m ²)			Average (KG/30 m ²)	Computative of per ha (KG)	Comparison %		Thousand Kernel weight
		I	II	III			Comparing to B	Comparing to C	
YN 15	A	22.1	21.4	21.7	21.7	7233	8.5	15.43	45.0
	B	19.7	20.4	20.0	20.0	6667	—	6.38	44.0
	C	19.2	18.4	18.8	18.8	6267	-6	—	40.1

10. Chrysanthemum

The test area is in the sunlight greenhouse of the garden.

To test with 3 treatments: A. Seaweed Extract Powder B. Natural contrast C. Water contrast

Repeat 3 times with the test area of 20m². To apply 4 times in the seedling stage, early budding stage and early flowering stage.

To measure the diameter of corolla in the peak flowering stage (investigate 10 plants in each area) (see form 10).

The yield of Seaweed Extract Powder fertilized area increases by 8.1% than that of water contrast area.

Form 10 Effect of Seaweed Extract Powder on Diameter of Chrysanthemum

Treatment	Chrysanthemum's Diameter of Test Area (Φ cm/flower)			Total	Average (cm/flower)	Comparison %	
	I	II	III			Comparing to B	Comparing to C
A	14.8	14.5	14.9	44.2	14.7	3.5	8.1
B	14.2	14.0	14.3	42.5	14.2	—	4.4
C	13.7	13.3	13.7	40.7	13.6	-4.2	—

Note: The investigation is on the diameter of each flower (cm).

Chrysanthemum is only for ornamental.

11. Cyclamen

The test is proceeded in the sunlight greenhouse of the garden.

The test is proceeded in the seedling stage of Cyclamen. Before the application of foliar fertilizer, an random investigation is carried out on leaf area and number of 15 plants in each treatment area, and then the test of foliar fertilizer is carried on.

To test with 3 treatments: A. Seaweed Extract Powder B. Common contrast C. Water contrast.

To dilute it with water for 2000 times.

To investigate on leaf area and changes of leaf number in each treatment area (investigate the plants before application, 15 plants/area).

It is seen from the investigation that leaves of treatment area thickens obviously, color is in dark green, grows fast, and increases by 15.76%(leaf area) and 7.7%(number of leaves) than that

of water contrast area (see form 11.1, 11.2)

Form 11.1 Effect of Seaweed Extract Powder on Leaf Area of Cyclamen

Treatment	Leaf Area (cm ² /leaf)				Comparison %	
	Before Application	After Application	After: Before (+)	After: Before (%)	Comparing to B	Comparing to C
A	4.62	5.87	1.25	27.05	5.29	15.76
B	4.55	5.54	0.99	21.76	—	10.47
C	4.34	4.83	0.49	11.29	-10.47	—

Form 11.2 Effect of Seaweed Extract Powder on Leaf Number of Cyclamen

Treatment	Leaf Number (flower/plant)				Comparison %	
	Before Application	After Application	After: Before (+)	After: Before (%)	Comparing to B	Comparing to C
A	6.25	7.25	1.0	16.00	4.62	7.70
B	6.15	6.85	0.7	11.38	—	3.8
C	6.00	6.50	0.5	8.3	-3.08	—

12. Red Maple

To carry on continuous test from raising seedlings to nursery.

Test treatment: A. Seaweed Extract Powder B. Common contrast C. Water Contrast

Test process:

April 20th: sow seeds and grow young plants.

May 16th: In 2-cotyledon stage, to spray Seaweed Extract Powder diluted with water for 2000 times.

May 25th: diluted with water for 2000 times to Spray for the second time.

June 8th: To Spray for the third time.

June 20th: To Spray for the fourth time.

June 12th: The first adjustment (leaf area, plant height). To adjust, in each treatment, 15 plants, and each plant with 2 leaves

June 25th: The second adjustment (still investigate the same plant then contrast) (see form 12.1, 12.2)

Form 12.1 Leaf Area In Seedling Stage Investigation Form

Treatment	Leaf Area (cm ² /leaf)				Comparison %	
	June 12 th	June 25 th	25/6 : 12/6 (+)	25/6 : 12/6 (%)	Comparing to B	Comparing to C
A	293	371	78	26.6	2.2	11.8
B	287	357	70	24.4	—	9.6
C	291	334	43	14.8	-9.6	—

Form 12.2 Plant Height In Seedling Stage Investigation Form

Treatment	Leaf Area (cm ² /leaf)				Comparison %	
	June 12 th	June 25 th	25/6 : 12/6 (+)	25/6 : 12/6 (%)	Comparing to B	Comparing to C
A	39	50	11	28.2	2.5	13.2
B	35	44	9	25.7	—	10.7
C	40	46	6	15.0	-10.7	—

Form 12.1 and 12.2 show that, in the seedling stage, leaf area and plant height that of Seaweed Extract Powder treatment area increase respectively by 11.8% and 13.2% than that of water contrast area, and the differences are distinct.

June 28th: To transplant the plants to nursery , set up the test area (45 plants/area), and repeat 5 times. To carry on tracking test in this stage (treatment is the same with the seedling stage), and Spray 5 times).

Dec 2nd: To investigate height and diameter of plants on Dec 2nd, plant height of each treatment is 45cm on average, showing no significant difference. The diameter is an important standard to measure the plant, so an emphatically investigation is made (see form 12.3).

Form 12.3 Effect of Seaweed Extract Powder on Diameter of Red Maple

Treatment	Diameter (Φ mm/plant)					Total mm	Average (mm/plant)	Comparison %	
	I	II	III	IV	V			Comparing to B	Comparing to C
A	6.0	6.5	6.0	5.5	7.0	31.0	6.2	3.3	14.8
B	6.0	7.0	5.5	5.5	6.0	30.0	6.0	—	11.1
C	5.0	6.0	5.5	5.0	5.5	27.0	5.4	-10.0	—