



Test Report of Application Effect of Soil Water Retaining agent (Super Absorbent Evergreen) on Soybean

1. Summit Enterprise Co. Ltd, in cooperative agreement with Shandong Soil and Fertilizer Institute undertook Field Trial research to evaluate the effect of its own Super Absorbent Polymer incorporated into the soil at time of planting on the germination, plant vigor, yield and monetary return in the production of soybean.

2. Date and Place

2.1 Test Date: JUNE,2017 TO OCT.2017

2.2 Test Place: Liangxi Village, Fangcun Town, Daiyue District, Taian City, Shandong Province

3. Climatic conditions in summer at time of planting: Hot with high evaporation potential.

Soybean planting in this region normally occur in early June.

4. Material and Method

4.1 Soil profile: Aquic brown Soil, moderate fertility, flat terrain.

Soil organic matter 1.37g/kg, Alkali hydrolysable nitrogen 120mg/kg, rapidly available phosphorus 27mg/kg, rapidly available potassium 97mg/kg, PH:7.1.

4.2 Product tested: Summit Enterprise Co. Ltd Super Absorbent Polymers for agriculture.

4.3 Test Agriculture Variety: Soybean, LUDOU II GRADE

4.4 Test method:

The test was laid out in the field in the form of a randomized block design of 30 square meter plots replicated 4 times for each treatment.

All treatment plots were fertilized identically in the planting row with 45 % compound granular fertilizer applied into the planting row at rate of 30kg/acre. Compost was also applied to the row in all plots at a rate of 2000kg/acre.

Three treatments were set up in the test:

1. Control - without use of super absorbent polymer (SAP) but with fertilizer applied to the row mixed with soil as described above (Refer to “A” in tables)
2. SAP, soil water holding agent with 1.6 kg/30 square meter plot applied into the planting row mixed with soil and fertilizer as described above. (Refer to “B” in the tables);
3. SAP, soil water holding agent with 2kg/30 square meter plot applied into the planting row mixed with soil and fertilizer as described above (Refer to “C” in the tables).

After completion of treatment all plots were planted identically with soybean seed into the row

5.Result and Analysis:

5.1 Effect of SAP, water retaining agent on the speed of germination and the rate of germination of soybean planted seed.

Table 1: Effect of SAP, water retaining agent on Germination of soybean seeds

Treatment	Sowing Date (Month, Day)	Seedling Germination Date (Month, Day)	Speed of Germination	Average Germination Rate (%)
A	JUNE 7	JUNE 16	9 days	88.1
B	JUNE 7	JUNE 14	7 days	94.3
C	JUNE 7	JUNE 14	7 days	94.7

From table 1, the germination speed and germination rate of Soybean Treatments B and C with SAP, water retaining agent, were better than those of the Control without SAP. Treatments B and C with SAP demonstrated that seedlings germinated 2 days quicker than the Control without SAP.

Treatments B and C with SAP demonstrated increased germination of seed planted with Treatment “B” average 6.2% higher, and Treatment “C” 6.6 % higher than that of the Control without SAP.

5.2 Effect of SAP, water retaining agent on plant vigor:

Field observation noted that Soybean plants which had been planted with SAP, soil water retaining agent, leaves were darker green and larger than the control plot.

5.3 Effect of SAP, soil water retaining agent on soybean yield.

Table 2: The effect of the super absorbent polymer on yield output of soybean

	Plot yield (kg)					Acre Yield (kg)	Increase compar ed with A (%)
	I	II	III	IV	Averag e		
A	7.3	7.8	8.1	7.2	7.6	169	
B	8.2	8.3	7.9	9.2	8.4	188	11.2
C	8.3	8.4	9.0	8.0	8.4	189	11.4

Table 2 showed that the treatment (B.C) with SAP, soil water retaining agent increased by 19-20 kg per acre compared to Control without SAP, the yield increased by 11.2%-11.4%.

Statistical Variance of the test results:

Table 3 Variance Analysis of soil water retaining agent used in Soybean

Place	Source of variation	Freedom	Sum of Square	Average square	F figure	F0.05	F0.01
Xiliang Pu,village,Fangchun	Processing	2		14238.5	76.59	6.944	18.00
Town Daiyue district							
	Repeat	3		185.9		6.944	18.00
	Total variation	11	3.72				

By variance test, the difference reached significant level, indicating that the use of SAP, soil water retaining agent has a significant effect, through multiple comparisons found that the use of SAP, soil water retaining agent two treatment and customary fertilization difference reached a very significant level.

5.4 Effect of SAP, soil water retaining agent on economic return in soybean production.

Table 4:

Place		Output(kg)	Price(rmb/kg)	Total volume(RMB)	Cost of SUPER ABSORBENT POLYMER (RMB)	The Increasing(RMB)
XILIANGPU VILLAGE	A	169	3.30	559.4	10	
	B	188	3.30	622.3		62.9
	C	189	3.30	625.4		66.1

Table 4 showed that the use of SAP, water retaining agent treatment showed higher financial returns with an increase of 62.9-66.1 yuan compared to the control without SAP.

6. Test conclusion

Under the local soil, climate and environmental conditions, we carried out the soybean experiment of water retaining agent, and conclude the following:

6.1 The application of SAP, soil water retaining agent in soybean treatment results in an improved percentage of germinated seed and quicker germination than the Control without using SAP.

6.2 The application of SAP, soil water retaining agent improved plant vigor and health when compared to the Control without SAP.

6.3 The application of SAP, soil water retaining agent in soybean increased 19-20 kg per acre compared to the Control without SAP this represents yield increase of 11.2%-11.3%, Acre benefit is 62.9-66.1 yuan.

6.3 The increase effect of the test reached a significant level, the value-added range is large.



Test performed by: Soil and fertiliser Institute of Daiyue District Test host by: Zhanghong

Report time: OCT,27 2017

Test Appointed by: SUMMIT ENTERPRISE CO., LTD.