

# CCS HARYANA AGRICULTURAL UNIVERSITY, HISAR

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Parwada, Visakhapatnam-531019

**SUB: Testing Report of Aquasorb in Mustard**

Sir

Please find enclosed herewith the evaluation report reg Aquasorb on Mustard conducted by Regional Research Station, Bawal during *rabi* 2016-17. Kindly acknowledge its receipt.

  
(S.K. Sethi)

Director of Research

Encl: As above

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**Effect of AQUASORB on water and  
nutrient use efficiency and crop  
productivity of Indian mustard  
(*Brassica juncea*) in Haryana**



***Rabi 2016-17***

**CCS HARYANA AGRICULTURAL UNIVERSITY  
REGIONAL RESEARCH STATION  
BAWAL (REWARI) – 123 501, HARYANA**

**Title of the Expt.:** Effect of AQUASORB on water and nutrient use efficiency and crop productivity of Indian mustard (*Brassica juncea*) in Haryana.

**Location:** CCS HAU, Regional Research Station, Bawal (Rewari) – 123501 (Haryana)

**Year of testing:** Rabi 2016-17

**Investigator:** Dr. Amarjeet (Assistant Scientist, Agronomy)

**Co-investigator:** Dr. M.K.Jat (Assistant Scientist, Soil Science)

**Treatments:**

T<sub>1</sub> : Control (without AQUASORB + full Package of Practices) under rainfed conditions

T<sub>2</sub> : Control (without AQUASORB + full Package of Practices) with one irrigation at pre-bloom / flowering stage

T<sub>3</sub> : Control (without AQUASORB + full Package of Practices) with two irrigations at pre-bloom / flowering and pod filling stage, respectively.

T<sub>4</sub> : 20 kg AQUASORB/ha + full Package of Practices under rainfed conditions

T<sub>5</sub> : 20 kg AQUASORB/ha + full Package of Practices with one irrigation at pre-bloom / flowering stage

T<sub>6</sub> : 20 kg AQUASORB/ha + full Package of Practices with two irrigations at pre-bloom / flowering and pod filling stage, respectively.

**Design:** RBD

**Replications:** Three

**Plot Size:** 19.2 m x 8 m

**Observations recorded:**

- Plant height (cm) at 30, 60, 90, 120 DAS and at harvest
- Dry matter accumulation per plant at 30, 60, 90, 120 DAS and at harvest
- Length of siliqua (cm)
- Number of siliqua per plant
- Number of seeds per siliqua
- Test weight (g)
- Seed yield (q/ha)

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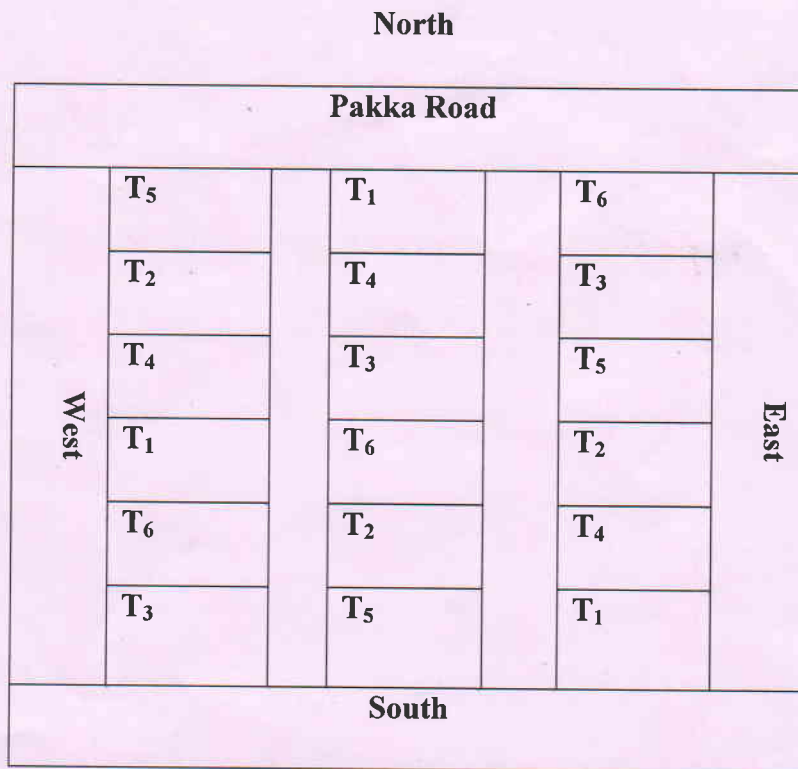
Amarjeet  
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## Methodology

A field experiment was conducted during *rabi* season of 2016-17 on aridisols at CCS Haryana Agricultural University, Regional Research Station, Bawal (Rewari), India. The location has a typical semi-arid climate. The soils of the experimental field classified as a Typic Ustochrept were loamy sand in texture, slightly alkaline in reaction (pH 8.1), low in organic carbon (0.20 %), available nitrogen ( $171 \text{ kg N ha}^{-1}$ ) and phosphorus ( $8.5 \text{ kg P ha}^{-1}$ ); and medium in available potash ( $182 \text{ kg K ha}^{-1}$ ). The mean annual rainfall is low (300-550 mm) and most of it (above 80 %) is received in rainy season (July to September). The average available soil moisture in soil profile at the time of sowing was 12.5 per cent. The experiment was laid out in randomized block design consisting of six treatments, replicated thrice. The mustard variety RH 30 was sown manually by pora method on 30<sup>th</sup> October, 2016 using seed rate of  $5 \text{ kg ha}^{-1}$  at row spacing of 30 cm. AQUASORB was drilled at sowing depth along with seed. Plant to plant distance of 15 cm was maintained by thinning excess plants at three weeks after sowing. Basal dose of N,  $\text{P}_2\text{O}_5$  and  $\text{K}_2\text{O}$  was applied @ 80, 30 and  $20 \text{ kg ha}^{-1}$ , respectively. A total rainfall of 64.3 mm was received during crop season (Fig. 2). No irrigation was applied at pod filling stage as the rainfall occurred on this stage (18.9 and 35.7 mm rainfall was received on 25 and 26 January, 2017). The crop was harvested on 25<sup>th</sup> March, 2017. All other recommended practices were followed to raise the crop. Lay out plan of the experiment is given as Fig.1.

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**Fig. 1 : Layout plan of the experiment**

Plot Size: 19.2 m X 8 m Net

Date of Sowing: 31.10.16

**T<sub>1</sub>** : Control {without AQUASORB + full Package of Practices (POP)} under rainfed conditions

**T<sub>2</sub>** : Control (without AQUASORB + full POP) with one irrigation at pre-bloom / flowering stage

**T<sub>3</sub>** : Control (without AQUASORB + full POP) with two irrigations at pre-bloom / flowering and pod filling stage

**T<sub>4</sub>** : 20 kg AQUASORB/ha under rainfed conditions (full POP)

**T<sub>5</sub>** : 20 kg AQUASORB/ha with one irrigation at pre-bloom / flowering stage (full POP)

**T<sub>6</sub>** : 20 kg AQUASORB/ha with two irrigations at pre-bloom / flowering and pod filling stage (full POP)

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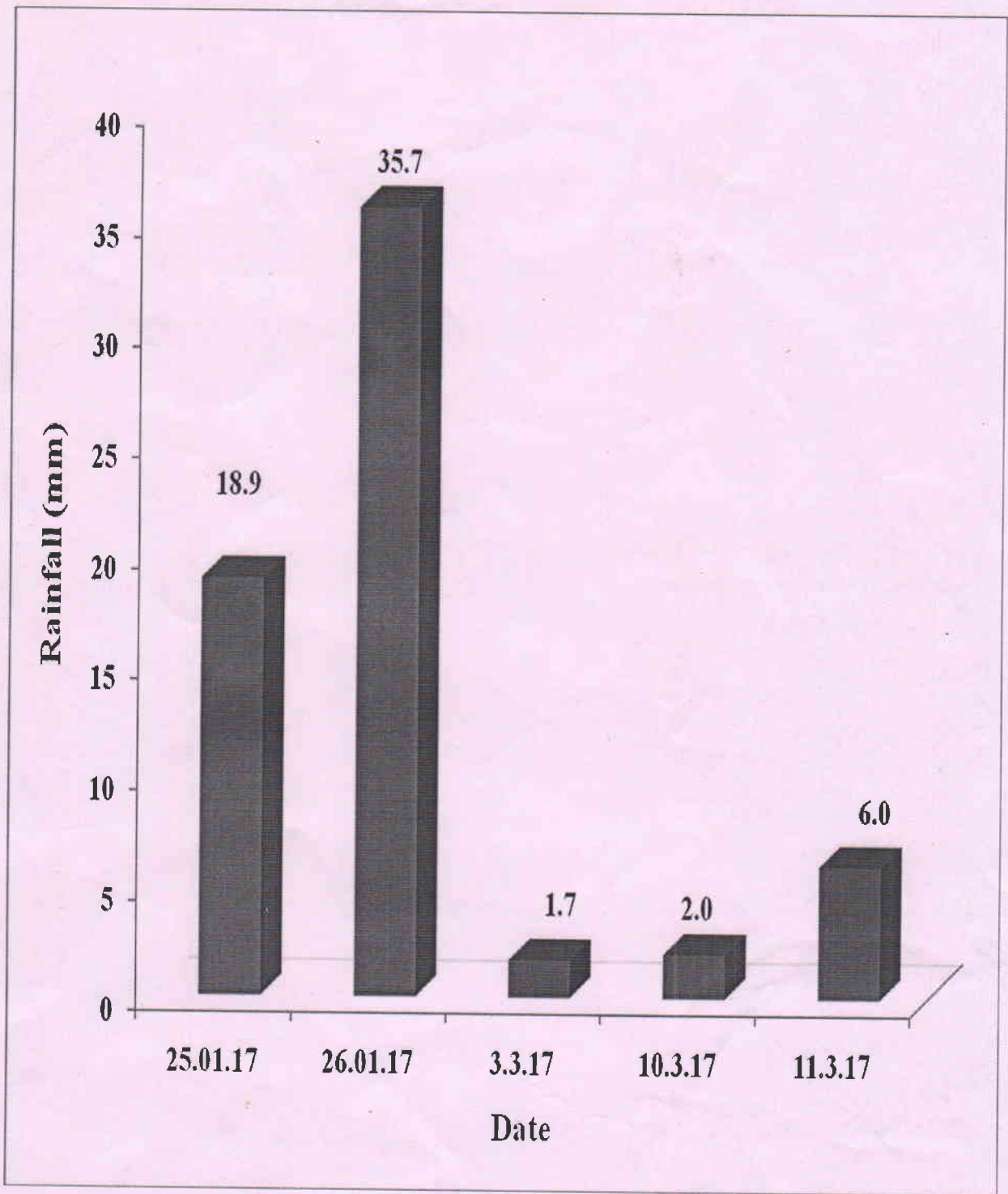


Fig.2 : Rainfall data of Rabi 2016-17 (mm)

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## Results:

The experiment consisted of six treatments i.e. control (without AQUASORB + full POP) under rainfed conditions (T<sub>1</sub>), control (without AQUASORB + full POP) with one irrigation at pre-bloom / flowering stage (T<sub>2</sub>), control (without AQUASORB + full POP) with two irrigations at pre-bloom / flowering and pod formation stage (T<sub>3</sub>), 20 kg AQUASORB/ha under rainfed conditions with full POP (T<sub>4</sub>), 20 kg AQUASORB/ha with one irrigation at pre-bloom / flowering stage (T<sub>5</sub>) and 20 kg AQUASORB/ha with two irrigations at pre-bloom / flowering and pod formation stage with full POP (T<sub>6</sub>).

However, as mentioned earlier that no irrigation was applied in T<sub>3</sub> and T<sub>6</sub> at pod filling stage as the rainfall occurred on this stage (18.9 and 35.7 mm rainfall was received on 25 and 26 January, 2017). Therefore, no significant difference was observed between T<sub>2</sub> and T<sub>3</sub>; and T<sub>5</sub> and T<sub>6</sub> in respect of any one of the parameters recorded (Table 1).

Under controlled conditions i.e. where no AQUASORB was applied, application of irrigation at flowering caused significant increase in seed yield of Indian mustard from 18.55 q ha<sup>-1</sup> under rainfed conditions to 21.66 q ha<sup>-1</sup> which was statistically at par with seed yield obtained with 20 kg AQUASORB/ha under rainfed conditions. It means application of AQUASORB@ 20 kg ha<sup>-1</sup> can supplement irrigation at flowering stage in Indian mustard. No significant difference was observed in seed yield in T<sub>2</sub> to T<sub>6</sub>. Same trend was followed in siliqua per plant. Other yield attributing characters i.e. seeds per siliqua and 1,000 -seed weight did not vary significantly among different treatments. Observations on growth parameters i.e. plant height and dry matter per plant was recorded at monthly intervals. Upto 30 DAS no significant difference was observed among different treatments in plant height and dry matter per plant, however, the treatments with AQUASORB had a slight edge over control treatments. At harvest, plant height and dry matter accumulation plant per plant was found significantly higher in all treatment in comparison to control.

Based on one year study it may be concluded that application of AQUASORB @ 20 kg/ha had favourable effects on growth and yield of Indian mustard under rainfed conditions and can produce statistically at par yield with one irrigation at flowering stage, if rainfall occurs at pod formation stage.

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Table 1 : Effect of AQUASORB on growth, yield attributing characters and yield of Indian mustard

Treatment	Pl height (cm)					At harvest				Dry wt per plant (g)				Length of siliqua (cm)	Siliqua / plant	Seeds/ siliqua	1000 seed wt (g)	Seed yield (q/ha)	
	60 DAS		90 DAS		120 DAS		At harvest		60 DAS		90 DAS		120 DAS						
	30 DAS	60 DAS	90 DAS	120 DAS	30 DAS	60 DAS	90 DAS	120 DAS	30 DAS	60 DAS	90 DAS	120 DAS	30 DAS						60 DAS
Control (rainfed)	32.0	102.0	203.0	206.7	207.7	3.6	16.0	49.9	73.4	74.9	4.6	151.0	13.5	4.7	18.55				
Control +1 Irrig.(F)	32.5	111.0	225.7	230.3	231.8	3.6	17.9	67.2	83.8	84.2	4.8	166.0	13.7	4.8	21.66				
Control + 2 Irrig.(F+PF)	32.3	111.7	228.0	231.7	233.7	3.6	18.3	68.4	84.0	85.4	5.0	168.0	13.9	4.9	21.87				
20 kg AQUASORB/ha (rainfed)	33.3	107.0	224.7	225.7	221.3	4.1	16.9	64.8	82.9	83.4	4.7	165.0	13.6	4.8	21.06				
20 kg AQUASORB/ha + 1 Irrig.(F)	33.0	113.7	230.3	235.3	236.3	4.1	19.1	73.8	88.1	91.3	5.0	174.0	13.9	4.9	23.11				
20 kg AQUASORB/ha + 2 Irrig.(F+PF)	33.7	115.3	237.0	238.7	237.7	4.2	19.4	75.3	89.2	92.3	5.0	176.0	13.8	5.0	23.15				
SE (m)±	1.1	2.3	6.2	5.3	3.7	0.3	0.5	3.3	2.8	2.8	0.3	4.4	0.6	0.4	0.72				
C.D. (P=0.05)	NS	7.2	19.8	17.0	12.0	NS	1.7	10.5	9.1	8.9	NS	13.8	NS	NS	2.27				

Irrig : Irrigation

F : Flowering

PF : Pod Formation

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