SUMMARY AND CONCLUSION

The present investigation was carried out in consecutive four seasons during 2006-2010 at open cultivable farmers’ field at Dakshin Paikbar mouza under “Deshapran Block” (Contai –II) in the District of Purba Medinipur, West Bengal for “Studies on the effect of growth regulators and nutrient management of chilli (Capsicum annuum L.) and its varietal evaluation in saline belt of West Bengal”. The field trials for all the experiments were conducted in Randomized Block Design with three replications, consisting of 25 plants in each plot measuring 4.5 m X 1.5 m accommodated with a spacing of 60 cm (Row to Row) X 45 cm (Plant to Plant). Standard crop management practices and plant protection measures were taken time to time. Ten randomly selected plants from each replication were taken to record the data on vegetative growth characters, flowering and fruit set and yield of the crop. For qualitative analysis, matured green and ripe fruits were taken from those plants for ascorbic acid and capsaicin content respectively. The objectives of the study were (1) screening of different local cultivars suitable for the agro-ecological condition of the saline belt on the basis of yield and quality characteristics (2) find out the effect of different combinations of organic and inorganic sources of nutrients (Nitrogen) on growth, yield and quality of chilli and (3) the response of chilli to the application of different growth regulators at different concentrations to find out their effect on growth, yield and quality of chilli.

Salient results of the different experimental approaches pursued in the present research programme and conclusions drawn on them are summarized here under.

Experiment No. I : Varietal evaluation of chilli in saline belt

Ten number of chilli varieties namely Beladanga, Bulet, Contai Black, Ratnamoni, Haringhata, Tara Sundari, Kajalpati, Singara, Jabakusum and Jhanti were evaluated on the basis of their vegetative growth, flowering behaviour and
fruit yield in the saline belt. The experiment was designed with ten treatments and three replication. During study of consecutive two years (2006-07 and 2007-08) under this experiment, it emerged out that considering the agro-climatic situation, growing media and normal practices provided to the plant, Beladanga variety performed the best with the average result of both years in relation to most of the characters. The minimum time to produce first flower was observed in Kajalpati (43.00 days) and maximum delay was recorded in Jhanti (54.50 days). The highest number of flowers per plant was recorded in the var. Beladanga (250.00), which significantly differed from other varieties (161.66-209.00). The lowest number of flowers per plant was found in var. Jhanti (141.66). The second best flower producing variety identified in this experiment was Jabakusum (209.00). The average results over the years showed a marked achievement with Beladanga (185.00) and the least performance in Jhanti (112.66). However, Beladanga variety produced 76.47% and 64.21% more number of flowers and fruits respectively per plant as compared to Jhanti. Beladanga showed highest individual fruit weight (710.00 g/plant) and lowest (230.00 g/plant) was obtained in Jhanti, which markedly increase (41.71-208%) on yield per plant over other varieties and same trend was found during investigation. The highest projected yield was obtained in Beladanga variety (253.5 q/ha of green chilli and 63.37 q/ha of dry chilli) over other cultivars and the second best (227.5 q/ha and 56.87 q/ha fresh and dry respectively) variety namely, Bulet may also be considered for cultivation in saline belt during rabi season for higher production. The lowest yield was recorded in Jhanti (fresh chilli yield, 75.50 q/ha and dry chilli yield 19.00 q/ha) followed by Singara. Beladanga produced an increased green chilli yield of 11.45-237.33% and dry chilli yield of 11.42-233.52% over other varieties. In the second year of study better result was seen as compared to first year, might be due to better adaptation to the environment. Regarding quality, highest capsaicin content (82.60mg/g of dry biomass) and ascorbic acid (120.60mg/100g of green edible chilli) was also obtained in this variety. Considering the Benefit Cost ratio cultivation of Beladanga variety was also found most economical (B:C ratio 4.03).
Experiment No. II: Study on the effect of integrated nutrient management on growth, flowering and yield of chilli var. Beladanga

On the basis of the performance in 1st Experiment, the best variety for the Saline belt i.e. Beladanga was chosen for Experiment II and III. This experiment was conducted during 2008-09 and 2009-10, with the objectives to identify the best source of nitrogen from organic and inorganic fertilizer, and their combinations for increasing growth, flowering and fruit yield of chilli. The experiment was designed with nineteen treatments and three replication. The selected manures which were easily available in this area namely Cowdung manure, Neem cake, Poultry manure, Vermicompost, Phosphocompost and Mustard cake were applied in different combinations with inorganic fertilizer (Urea) at three levels (25%, 50%, and 75%) to enrich growing media. Increasing dose of N (25 to 75%) from Mustard Cake induced flower early by 2-3 days with combination of urea. It has also been indicated that, in this experiment, increase in inorganic nitrogen level (25, 50 and 75%) in the growing media delayed flowering compared to all organic manures. Maximum delay in flowering by 4 days were observed, when plants were manured with 50% N from cowdung and phosphocompost with 50% N from urea. It was observed that increased level of nitrogen from urea (25, 50 and 75%) along with reducing doses of organic manures (75, 50 and 25%), like cowdung manure, neem cake, poultry manure and vermicompost induced more number of flowers per plant, whereas, N as a source of phosphocompost and Mustard Cake at higher level (75%) with low level of (25%) urea also showed positive effect on flower production. All levels of nitrogen received from vermicompost showed very pronounced effect on flower production (250.20-260.20) of chilli. But best combination was obtained with 50% N from both the sources (Vermicompost and Urea) and produced 42.19% more flowers (260.20) as compared to control and lowest (120.60) no. of flowers was obtained with the combination of 25% N from phosphocompost along with 75% N from Urea. Regarding no. of fruits per plant, the best combination of urea and vermicompost at 50% obtained 51.55% more fruits per
plant (161) over control. But lowest number of fruits was obtained with 25% N as phosphocompost alongwith 75% N from urea. Weight of individual fruit was highest (7 g) under treatment with 50% nitrogen both from vermicompost and urea and lowest weight was found under control (4.0g) i.e. without application of nitrogen. Other organic manures along with urea also improved the fruit weight, but magnitude of improvement was not so pronounced during a couple of years. The plant produced average highest yield (1127.0g/plant) when treated with 50% N from VC + 50% N from Urea, whereas, lowest (312.0g/plant) performance was observed with the plant without nitrogen in control. The plant showed average highest projected yield (250.75q/ha) when treated with 50% N from VC + 50% N from Urea, but lowest (48 q/ha) performance was observed with untreated plants in control. During the Second year of the experiment, almost same trend was found in above mentioned parameters. The combination played an important role in vegetative growth and yield i.e. increased number of fruits per plant by 55.55%, increased weight of individual fruit by 42.80% and increased yield per plant by 261.21% more than control (without Nitrogen). The highest B:C ratio of 5.52 was also obtained in this combination, indicating the maximum economic benefit. But, regarding the quality aspect, neem cake as a source of nitrogen @ 25% played a vital role for improvement of capsaicin and ascorbic acid content in the fruit viz. capsaicin content, 114.20mg/g of dry biomass and ascorbic acid content, 185.50 mg/100g of green edible chilli. In case of this experiment also second year of study was found better than first year of experimentation.

**Experiment No. III : Study on effect of growth regulators on growth, flowering and yield of chilli var. Beladanga**

This study aimed to identify the best growth regulators among GA₃, NAA, CCC, Ethrel, PPP₃₃₃ and MH to influence the vegetative growth, flowering behaviour and yield as well as quality improvement of chilli var. Beladanga. The experiment was designed with thirteen treatments and three replications. Apart from other agro-techniques provided to the plants during the investigation (2008-10), it was seen that NAA at lower concentration (50 ppm)
by foliar spraying on chilli var. Beladanga in saline soil showed encouraging
effect on vegetative growth and yield. The average individual plant yield as well
as green chilli yield per ha was obtained highest (1083 g/plant and 270.75 q/ha),
when plants were treated with NAA at 50 ppm followed by NAA at 100ppm
(917.70 g/plant and 229.94 q/ha) in comparison to other treatments (yield
237.90-917.70g/plant and 59.47-238.70 q/ha). The second best treatment in this
aspect was identified with GA₃ at 25 ppm (yield 954.70 g/plant and 238.70
q/ha), whereas, PPP₃₃₃ at 250 ppm and 500 ppm treated plants were lowest yield
( 237.90 g/plant and 59.47 q/ha) and (260.00 g/plant and 65.00 q/ha)
respectively, i.e. increased number of fruits/plant by123.33%, increased weight
of individual fruit by 81.20% and increased fruit yield per plant by 243.04%
more than control. Regarding quality parameters of fruit one growth promoter
(GA₃ ) and two growth retardants like CCC and MH improved fruit quality at
all concentrations with higher capsaicin (100.80-115.30 mg/g of dry biomass)
and ascorbic acid content (172.60 -177.50 mg/100g of green edible chilli ).

From the above observations it may be concluded that

(1) Beladanga variety is found to be most suitable for this area (Saline
belt) followed by var. Bulet.

(2) Application of vermicompost alongwith inorganic nitrogen (Urea) as
source of 50% N each may be considered best for highest yield. Neem
cake improved the quality of fruits.

(3) Foliar spray of growth regulators like GA₃ at 50 ppm produced the
highest fruit yield of chilli var. Beladanga in Saline belt of West
Bengal.