



**SUCCESS STORY OF PROJECT ON  
INNOVATIVE TECHNOLOGY TRANSFER FOR  
PROFITABLE GINGER CULTIVATION IN MORNI HILLS OF  
HARYANA**



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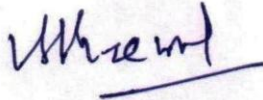
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## ACKNOWLEDGEMENT

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At the field level, the hard work carried out to ensure the proper implementation of the project by all the participating farmers including Mr. Multan Singh the resource person, Sh.Baldev Singh, Sh.Pawan Kumar and Sh.Ranjeet Singh the executive committee members deserves whole hearted appreciation. The contribution of data handling most efficiently by Mr. Pawan Kumar our computer operator is duly appreciated. This operational research type of project would not have been completed without the active participation of all the 32 farmers of Chaplana and Kharuni villages. SPACE team duly acknowledge the contribution of this common interest group of vegetable growers for the success of this endeavor.

  
**Society for Promotion &  
Conservation of Environment  
(SPACE) CHANDIGARH**

Dr.S.S. Grewal

President SPAPCE

September 1<sup>st</sup>, 2020



**SUCCESS STORY OF PROJECT ON  
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CULTIVATION IN MORNI HILLS OF HARYANA**

Ginger is a precious gift of nature as its medicinal values widely recognized. God has not given it facial beauty but made it full of amazingly beneficial properties. India produces 50% of the ginger in the world and 50% of this is produced in North-East states and other ginger producing states are Kerala, Orissa and West Bengal. In case of North India, maximum ginger is produced in foothill areas of Himachal Pradesh. Haryana produces only 7% of the total ginger production in India and the same is raised in the Morni Hills of the state. The cultivation of ginger is closely associated with soil and climate conditions and best production comes from foot-hill areas. In Morni hills, ginger is raised wherever there are limited irrigation facilities and best quality ginger is produced which is mainly used for making ginger powder, *Saunth* (dried ginger).



**Contribution of NABARD in Promotion of Farmers Welfare Programs in Morni Hills**

The National Bank of Agriculture and Rural Development (NABARD) through its Haryana Regional Office has been promoting the common interest groups and farmer's producer organizations to improve the economy of hill farmers of Morni area. It provided funds to the SPACE, a professional NGO for water resource development, roof water harvesting and formation of farmer's producer organization in Morni Block of Haryana basically to improve the livelihoods of vegetable growers of this remote area of Haryana. The water resource development promoted ginger cultivation, a most common cash crop of this area particularly in the commands of water storage tanks constructed under these programs. The officers of the NABARD visited these projects very frequently and interacted with the Ginger growers (Photo).



## **Background of the project on cluster development**

NABARD Haryana supported the formation of a farmers' producer organization (FPO) with SPACE as promoting agency in the Morni block of Panchkula District during January, 2016 basically to promote agri-business concept amongst small farmers for improving their economic returns. More than 400 vegetable growers joined this FPO named as "Morni Hills Sabji Utpadak Sangthan Producer Company Pvt. Limited." The Department of Horticulture, Haryana started channelizing its horticulture development programs with subsidized incentives on tools and plants through this FPO in the Morni block. Working with farmers cultivating ginger, it was felt that there is considerable gap in potential and actual crop yields and resultant returns achieved and such a gap can be bridged by innovative technology transfer through cluster development where integrated package of practices could be implemented, tested, refined and then transferred to other similar areas. In the background of the above, SPACE planned to take up a project on innovative technology transfer by adopting one typical village for technology testing, refining and dissemination.

From the analysis of farmer's present production and returns it became very clear that ginger cultivation is profitable only when the yield is more than 50qtl/acre. The ratio between raw ginger and *Saunth* (dried ginger) should be above 20% (ratio of 5:1) and quality of *Saunth* should be such that maximum yield is in (a) and (b) category of rhizomes. Now the question was how all other farmers reach the level of 50qtl/acre or a ratio of 5:1 or (a) & (b) category produce of *Saunth*. How to upscale the production levels and economics of ginger cultivation was a question mark? With this aim in view, it was planned that one compact block of ginger growers should be selected as a testing ground or field laboratory where farmers are organized as common interest group and supported to adopt the complete technological package and helped in joint marketing for maximizing the profit.

In the Morni block, vegetable cultivation is concentrated in Bhoj Tipra, Bhoj Koti and Dharara Gram Panchayats covering about 35 small villages/hamlets. It was found that village Chaplana of Bhoj Koti Gram Panchayat has a compact block of 32 ginger growers and this block can be taken up for this project on maximizing profitability of ginger through good agricultural practices. Village Chaplana is famous for vegetable cultivation particularly ginger as a large chunk of land well terraced and irrigated is available for intensive cultivation of vegetable crops. Chaplana village provided an opportunity to adopt for the innovative techniques of technology transfer on vegetable crops in general and ginger in particular. All the 32 farmers having 60 acres of land under vegetable cultivation were members of the FPO. The main task was to motivate the farmers for the adoption of scientific package of practices through awareness generation, demonstrations, exposure visits, trainings and expert interaction for technology transfer and adoption on sustainable basis.

It was felt that the ground realities in the village should be studied and problems diagnosed before planning a need based and demand driven project. In order to develop a better understanding of the bio-physical conditions of Chaplana village, the SPACE team visited it on

14.01.2018. All issues concerning the problems of ginger cultivation were discussed with the farmers. The following problems emerged:

- Scarcity of water and inadequate supply from existing Kuhl to mature vegetable crops.
- Procurement of ginger seed from Himachal Pradesh which turns out to be very expensive but also brings pathogens which have infested the land.
- Infestation of diseases and pests not treated properly resulting in huge yield loss.
- Low adoption of technological package due to poor financial condition
- Marketing problems are faced where farmers are cheated by local traders.
- Poor organizational ability of ginger growers and inadequate extension services.



#### **Awareness generation meeting with farmers of Chaplana village on 14.01 2018**

The farmers of Chaplana village are settled in two settlements one is main village Chaplana and second is small village Kharuni located on the bank of Ghaggar River. The land of 32 farmers is situated at both the settlements and their interests are common. A list of 32 farmers, their total land holding and area under vegetables was compiled (ANNEXURE-I).

#### **Sanction of Budget Proposal**

There were discussions on the concept note sent to NABARD on 08.03 2018 and only add on costs for 32 demonstration plots was agreed plus trainings and exposure visits. The project was sanctioned for Rs 9.72 lakhs by the NABARD through its letter NB/FSPF-SPACE-CHAPLANA/591/2018-19 dated 26.12.2018. The provisions approved are listed in the table given below.

**Table: Budgetary provisions of the sanctioned project by NABARD Haryana**

Sl. No	Particulars of activities included in the sanctioned proposal	Amount sanctioned (Rs)
1	Lining of irrigation kuhl, 435m, (Total cost @Rs.920/m, Material cost @Rs.330/m, Other costs @Rs.590/m)	194448
	Support for Material Cost	
2	Technology transfer through training, workshops and exposure visits	110000
	2.1 Compilation of booklet and / or documentary for agricultural practices for ginger, onion, tomato, cucumber, and coriander	10000
	2.2 Discussion in village on issues and action points with resource persons, 10 nos., @2000 each (payment for tea, snacks, etc.)	20000
	2.3 Exposure visits to advance centres on vegetable cultivation techniques, progressive FPOs, etc. (2 nos., 15000 each)	30000
	2.4 Two workshop/year for demonstration and interaction	0
	2.5 Support for village agriculture school with tables, chairs, charts, etc. including rent of the room	0
	2.6 Honorarium to resource persons, KVK, horticulture marketing 10 visits, Two persons (10 visits @Rs.1500/day, two persons)	30000
	2.7 Travel cost 10 visits (@Rs.2000/visit)	20000
3	One resource person for logistical arrangements, data collection, coordination (@Rs.5000/month for 12 months)	60000
4	Cost of innovative package of practices-add on cost, for 32 bighas	240000
	4.1 Cost of seed treatment before planting @700/bigha	22400
	4.2 Cost of soil sterilization with black polythene sheet @1000/bigha	32000
	4.3 Cost of bio-fertilizer, NPK and micro-nutrients on soil test basis @Rs.3000/bigha	96000
	4.4 Cost of Trichoderma and neem cake @Rs.800/bigha	25600
	4.5 Plant protection cost @Rs.2000/bigha	64000
5	Support to implementation agency @20% of cost (20% of Particulars (1+2+3+4+6))	162040
	Total Grant Support	766488
6	Farmer contribution (Cap of 20% on capital expenditure. The balance, as agreed by the agency, will be contributed by the farmers.)	205752
	Total Cost of the project	972240

The SPACE signed the TOR on 28. 12.2018. The letter of intent was signed on 31.01 2019 and first grant of Rs 253997 was released on 16.03 2019

## **IMPLEMENTATION OF THE PROJECT**

### **Soil testing of demonstration plots**

The surface soil samples (0-15cm) of all the 32 demonstration plots were taken by the farmers air dried, labeled, and got analyzed from the Soil Testing Laboratory of Dept. of Agriculture, Haryana at Panchkula. The soil test reports of each farmer were generated and results explained to the farmers and fertilizer application was made as per soil test results. The results were tabulated for all the farmers and a summary table was generated. It was noted that the average pH is 6.9 (Norma), EC 1:2 is 0.67 dSm/m (Normal), OC 0.46% (Low), available N



117kg/ha (Low), available Phosphorus  $P_2O_5$  30kg/ha (Medium), and Potash  $K_2O$  156kg/ha (Medium). The Sulfur, Zinc, Iron (Fe), and Copper (Cu) were high and Manganese (Mn) as medium.

### Joint Purchase of Inputs

A list of input per bigha (one twelfth of a hectare) was finalized by a committee of three scientists Dr. J.S.Kanwar Former Professor and Head Department of Horticulture PAU Ludhiana, Dr. Ravinder Kumar Plant Pathologist of KVK Panchkula and Dr. Brijesh Kumar Former Scientist of University of Horticulture and Forestry Solan. A survey of market was carried out by the committee of farmers and Er. H.S.Lohan; former Additional Director of Agriculture Haryana and a member of SPACE. The rates were verified and purchases made at the lowest rates. All the inputs were purchased in the presence of farmers and their signatures were taken on vouchers so that a most transparent system was followed.



**Photo: The purchased material was stacked for distribution in the village**

The seed treatment was carried out as recommended. The FYM was added by the farmers and fields were prepared in the form of ridges and trenches and sowing was carried out at recommended spacing by the addition of vermin compost and neem cake (Photo).



Each farmer kept proper record of inputs and comparable untreated plots were earmarked and their input data also recorded. There were regular rains during the crop growing season. Farmers were advised telephonically whenever there was a problem. There was lot of difference in the growth and health of the ginger crop between demonstration and control plots (Photo).

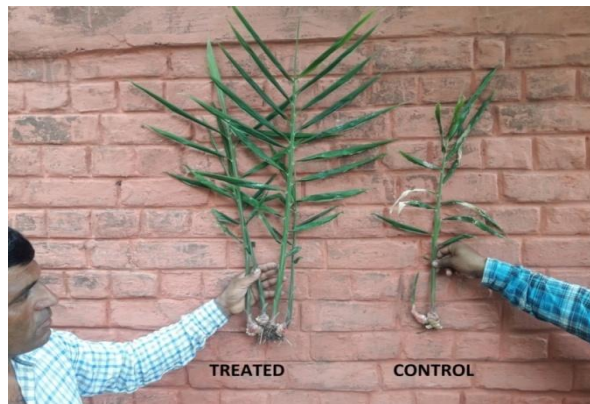


**Photo: Condition of crop in demonstration plots with, lush green and no disease**



**Photo: Condition of crop in control plots with disease infestation and drooping leaves**

During the group meetings, field visits were arranged to guide the farmers about disease symptoms and other good agricultural practices. Farmers are taking lessons from Dr. Ravinder Kumar Chohan of KVK Panchkula during one of the training program(Photo).



**There was hell lot of difference between treated and control plants (Photo).**



## **FARMERS TRAININGS, EXPOSURE VISITS AND GROUP DISCUSSIONS**

There was a provision of Rs 110000 for compilation of a booklet for recommended agricultural practices, trainings, exposure visits and group discussions with experts

### **Group meeting held on 16.4.19 at village Chaplana**

This meeting was held to sensitize the villagers about the aims, objectives and the methodology of operation of this project including roles and responsibilities of the farmer and discussion on technological package for successful ginger cultivation. A committee was constituted to work as executive body for making purchase of inputs and distribution. With general agreement, Sh Multan Singh was selected as resource person as he was a graduate with knowledge of computer.

It was decided that Multan Singh would maintain full records of input supplied and get signature of the farmers. He will also coordinate for all trainings and group discussion and arrange venue and make other logistic arrangements. Each farmer would meticulously follow the package of practices and also maintain one bigha of ginger crop as untreated control. All the farmers would collect soil samples from the demonstration plots for soil testing and method of sample collection was explained. A list of 32 vegetable growers was made with their total area and area under vegetables. It was made mandatory that each farmer must become the share holder of the FPO.



### **Awareness generation meeting with vegetable growers of Chaplana village on 16.04.2019**

### **Training workshop and PMIC Meeting held on 30-05-2019 at Village Chaplana**

This meeting was held as a PMIC first meeting in which DDM Ambala also participated. The discussions included lectures on production technology and disease management and also the budgetary provisions, amount released, balance available and also the issue of installation of pipeline instead of open channel. The PMIC decided to install the pipeline instead of open

channel because of its number of benefits. The farmers strongly felt that instead of lined kuhul, conveyance pipeline of 3” dia preferably of Jindal make B-Class should be preferred in view of terrain conditions and stability of the system. As regards the financial expenditure, a sum of Rs.190676/- were spent on GI Pipe- B Class Jindal make. Only 330m length including flanges/nut bolts could be procured with the sanctioned grant of Rs.194448/-.The farmers transported the pipes to the village by spending Rs.7000/- from their own resources. The experts sensitize the beneficiary farmers about the good agricultural practices for ginger and turmeric cultivation. The recommended package of practices was shared with the farmers.

The DDM Ambala suggested that the farmers should get the benefit of Kisan Credit Cards. It was learnt that only two farmers have prepared the Kisan Credit Card. He wanted that Chaplana should be a model of agro-business development for replication in other similar areas. The participation of women members was appreciated. The workshop ended with a vote of thanks to the experts, DDM Ambala and the participants.



**Mr Deepak Jakhar, Dr.J.S.Kanwar, Dr Ravinder Chauhan addressing the workshop**

### **Group discussion in village on 22.7.2019**

The meeting was held to update the members about the progress of this project, future planning and review the need of release of payment if required from the NABARD Haryana. Dr.S.S.Grewal welcomed the members and provided brief introduction and status of the project. The main issues decided by the PMIC:

1. The polythene sheet should be purchased now out of Rs.32000/- as farmers requested that this sheet would be of great use during the drying and processing of ginger. It was therefore decided that the sheet may be purchased and supplied to the farmers for Rs.1000/each.
2. In order to carry out remaining programs of Capacity Building @Rs.7000 per program and Rs.5000/- for resource person/month, funds would be required. It is suggested that funds for 4 programs and Salary of resource person for four months may be recommended for release or the available funds of Rs.58000/- may be used for this purpose till the amount is released.
3. The next exposure visit would be organized to Paonta Sahib (HP) area for the study of technology of Ginger seed preservation, mechanical drying and marketing.

## Village Level Discussion held on 10-09-2019 at Village Chaplana

This group discussion was arranged at mid growth level of crops and discuss disease management and financial issues. Dr.S.S. Grewal welcomed the participants and resource persons and informed that the ginger crop has reached middle of the physiological growth stage and there was need to interact with the farmers and also inspect the condition of crop in the field. Dr.R.S. Chauhan, the pathologist with the KVK Panchkula joined for discussion and field visit.

The crops have passed through a very difficult period caused by heavy rains during the month of August, 2019. Sometimes, farmers sprayed their crops and there was heavy rain thereafter and as a result, the response expected through the spray could not be achieved. The farmers were advised to modifying the spray schedule so that crop does not suffer from insect and pest attack. A good amount of discussion was held on the implementation of different recommended package of practices including schedule of inputs. All the farmers reported that they have meticulously followed the recommended package.

Dr.S.S.Grewal carried out an exercise with the farmers to work out the total cost of cultivation of ginger crop following the all package of practices. The cost turned out to be about Rs.50,000/bigha. This amount can only be recovered if farmers get ginger production of at least 8 quintals per bigha or 1.5 quintals of dry ginger per bigha. There will be as such no gain at this level of production. The gain of Rs.20000/bigha would be possible only if the ginger production is about 10 quintal per bigha and its ginger powder value would be Rs.80000/-. The farmers were motivated to make out all out efforts to raise the yield level of ginger above 10 quintal per bigha.

After discussion, farmers were taken for field visit to the ginger crop where all the inputs were applied. The crop was excellent, disease free and farmers were satisfied with this level of growth. In the control plots, the plants were relatively weak having less height, less number of leaves and less number of tubers. The plant samples from both treated and untreated plots were taken out and shown to the farmers the real difference between the two.



The farmers were advised for future line of action and telephone numbers were noted for any query at any time. The farmers wanted that this type of interaction should be continued.



- a) The saving of Rs.32000/- earmarked for the purchase of polythene sheet, it was decided that this amount be utilized for the purchase of black tarpolin sheets which are useful for drying and covering of the ginger during the processing period.
- b) The KVK expert advised to purchase Carbendazem, Dichlorphos and Streptocycline to meet out the same requirement as was to be provided by Bordeaux mixture.
- c) The funds available for technology transfer were utilize to organize meetings and there was no balance available. The DDM was requested to get the next payment released.
- d) The storage of ginger seed at village Mehmal and Kathi is quite possible and we shall take up this issue near the harvest of the ginger crop.

### **Main Issues for Discussion**

1. Though production has been well taken care of by ensuring disease free crop and duly provided with recommended package of nutrients but marketing of ginger powder remains a problem for whole of the Morni area. There is a need for developing market linkages with some companies who may purchase the ginger from the farmers directly.
2. The replication of Chaplana village cluster development program needs wide publicity and it is proposed that the whole process should be filmed by NABARD at their level.
3. The major cost in the cultivation of ginger crop is the seed material which is purchased from higher hills every year. This is because it is difficult to preserve the seed due to high temperature. Some cold storage facilities need to be developed for storage of ginger seed.

### **Village level discussion with NABARD TEAM held on 10.10.2019 at Village Chaplana**

There are several projects being funded by NABARD Haryana but for the last two years no senior officer of the NABARD visited the project area and discussed the grass root level problems of this very difficult area of Morni Hills. Considering that, there is inadequate appreciation of the implementation problems of the NABARD supported projects, Dr.S.S.Grewal requested the General Manager, NABARD Sh.Dinesh Kumar Kapila to make it convenient to save some time for a visit to some of our projects in the Morni Hills. On this request, Sh.Dinesh Kumar Kapila GM and Sh.Suman Kumar DGM visited the project area on 10.10.2019 along with Sh.Deepak Jakhar DDM Ambala. On behalf of the SPACE, Dr.S.S.Grewal President SPACE and Er.H.S.Lohan General Secretary SPACE conducted their visit to Chaplana project.

Dr.S.S.Grewal welcomed the NABARD team to village Chaplana which is a very remote village never visited by any senior officer of any of the Department. The background of this project, the activities undertaken and the implementation approaches were explained to the visiting team. After a brief introduction with the beneficiary farmers of this project, the team visited the project area. First of all, the team along with farmers visited the location of the irrigation kuhl located very close to the village. The farmers informed that this is a perennial kuhl which is the backbone of vegetable cultivation in this village. The kuhl was constructed about 15 years back with funds from the Gram Panchayat. The discharge of the kuhl decreases

during summer months and there are lot of breaches in this 500km long kuhl. Because of the breaches and slippage of land, there is lot of seepage and conveyance losses and precious irrigation water is lost in the transit. In case, the loss of precious water is controlled, there will be substantial increase in the productivity of vegetable crops. This was followed by good amount of discussion with the farmers (Photos).



Then the team visited the demonstration plots laid on the cultivation of ginger crop with innovative package of practices. The large chunk of ginger plots were seen by the team and several questions were asked by the NABARD officers to the farmers. The sequence of application of inputs to the demonstration plots was explained by the farmers and the transparent method used by SPACE for procurement of farm inputs was also highlighted. The farmers showed the difference in crop growth between the demonstration plots and the control plots which was highly significant. Mr. Multan Singh, the resource person showed the record of crop production before the project, the distribution of inputs to the farmers with their signatures maintained in a project register. The register was keenly inspected by the team (Photo).



After the field visit, there was a meeting with the farmers to discuss the issues and concerns of the farmers. The justification for the installation of G.I. pipeline at a cost of Rs.194448/- was explained by the farmers. The post harvest processing of ginger and turmeric is a problem because it requires sun drying of the produce during the winter months. Sh.H.S.Lohan explained that these farmers are regularly attending meetings, and have participated in different trainings and exposure visits organized for the FPO members. Sh.Deepak Jakhar DDM Ambala

informed that NABARD has entered into contract agreement with AGNET, a corporate house which will purchase all the turmeric powder of the registered farmers at the rate of Rs.250/kg. Dr.S.S.Grewal explained the details of convergence with the Department of Horticulture, Haryana through which more than Rs1.20 crores have been disbursed to the farmers as subsidy for the purchase of tools and equipments related to vegetable crops.

After good amount of discussion, Sh.Dinesh Kumar Kapila GM delivered a detailed lecture on the agri-business concept for improving the income of the farmers. He laid lot of stress on marketing intelligence and suggested the farmers to explore the markets where products are sold at high prices. He also advised the farmers to keep proper accounts of the cost incurred on production of the crop, net income received and progressive increase / decrease in the income. There was better appreciation of efforts of SPACE working in very remote hill areas. The team assured all possible help and assistance to the Chaplana farmers for improving their livelihoods.



**Visit of CGM and DGM NABARB to CHAPLANA PROJECT on 10-10-2019**



**Meeting with Board of Directors of FPO at Skylark Forest Rest House.**



## Village Level Discussion held at Village Kharuni on 15-11-2019

Several village level discussions were held at Chaplana and farmers of Village Kharuni wanted that one of the discussions may be held in their village which is satellite village of Chaplana. All the farmers having land in Village Chaplana have also their land in Village Kharuni but only seven – eight families are permanently settled in Kharuni. There were reports that the crop of ginger is infected by a disease in some of the plots which needs to be seen by the experts. Keeping in view the above request, the village level discussion was arranged at Village Kharuni on 15.11.2019 in which Dr.J.S.Kanwar member SPACE and Dr.R.S.Chauhan KVK Panchkula also joined. It is very remote village linked by a katcha road traversing through hill slopes over a distance of 5km from the main Panchkula – Morni Road. The fields were inspected by the experts and interaction was held in the field and condition of the crops was noted. It was noted that the imperfect drainage was the main reason of disease infestation and farmers were advised to provide proper drainage and avoid stagnation.



In the demonstration plots, the crop condition was extremely healthy as shown in Photograph-2. There was very slight incidence of disease in slightly depression areas. Otherwise, all the demonstration plots had very healthy crop growth. There was rainfall after the last spray to the crop and proper impact could not be achieved. The pesticide was available with all the farmers and they were advised to apply one spray on a clear sunny day to tackle this problem. The following issues came up for discussions:

- All the farmers were advised to keep a proper record of the output by properly weighing the produce using the standard crates. This would be compared with the control plots.
- All the farmers agreed that they will not sell the ginger produce individually and negotiate the rates collectively to get a better price.
- Dr.Kanwar suggested that wide publicity be given about the ginger available at one place in village Chaplana and invites the prospective traders to inspect the crop and quote the rates.
- It was also decided that the Chaplana farmers would store their own seed either at Village Mehmam or at Dharara where the seed does not decay due to better climatic conditions.

- Dr. Chauhan suggested that whenever there is any sign of any disease, the farmers should contact him on his phone number and he will advise the farmers immediately. They should send the photographs of the infected plants for proper diagnosis of the disease.
- In order to motivate the farmers, plant samples from demonstration plots and control plots were taken, washed and placed before the farmers for comparison. It was so evident that the demonstration plot plants were much healthier, taller, larger number of leaves and larger number of tubers as compared with the plants of the control area.
- There was a problem of conveyance losses of irrigation water beyond the pipeline already laid under the project. The farmers are insisting that 108m pipeline should be arranged to complete the total length of the pipeline so that the losses in transit are avoided. The tank and the old kuhul system was inspected by the team and promised that a suitable proposal shall be sent to the NABARD for getting funds for the additional pipeline.
- In the concluding session, it was decided that the next exposure visit shall be organized in December, 2019 to a Modern Nursery Project of Sh.Harbir Singh on Shahbad – Markand to Barara Road. The farmers were advised to get the nursery seedlings of onion from this nursery.



**Group photo with farmers at Karuni village**

### **Village level workshop and group discussion held on 23.12.2019 at Village Chaplana**

This meeting of the PMIC was called to review the progress of the project, to have the views of the farmers about the condition of the crops covered under the project, and prepare proposal for the exposure visit. At the very outset Dr.S.S.Grewal welcomed the participants and Sh.Wazir Singh Deputy Director Agriculture and Sh.Deepak Jakhar, DDM NABARD Ambala.

The farmers informed that this year the rainfall situation was very favorable and they have applied all the inputs supplied under the project and the condition of crops is satisfactory till day. They were also happy that the price of the ginger is very good in the market this year and they are likely to get good economic benefits from this crop. They are expecting very good yield and there is clear difference between the treated and untreated control plots.

Mr. Wazir Singh Deputy Director Agriculture interacted with the farmers and advised that the grading, sorting, packing and branding should be given high priority to get the maximum price from the vegetable crops. The farmers should arrange to get an outlet at the Kisan Mandi in Panchkula and they can get better price in the Kisan Mandi. The farmers should get organized and purchase inputs together which can be obtained at lower price. There is a provision in the Department for water resource development. The construction of kuhul, pipelines and retaining walls wherever necessary can be funded by the Department but such a proposal should be approved by the Gram Panchayat and sent through the concerned assistant Soil Conservation Officer, Panchkula. He reminded the farmers that during last year improved variety of maize seed was given and the results were very encouraging. The farmers also reported that the variety was high yielding and much better in performance than their local variety and the seed should be given again during this year.

The DDA informed that there is a crop insurance scheme where maize, wheat, sarson and potato are covered where in case of any damage Rs.15000/acre is paid to the concern farmer. The interested farmers may get registered under this scheme and last date is 31.12.2019. He informed that a common service centre has recently been open at Dhaman Village and farmers can get all agriculture / horticulture related services from this centre. He enquired that whether or not small farmers are getting Rs.6000/year from the State Government, some of the farmers reported that they are getting but some of them are expected to get.

The DDM Ambala suggested that the crop yield data of one year may not be sufficient for comparison with the demonstration plots. We should take the average data of crop yield for the last 2 – 3 years to get a clear picture of benefits from the inputs we have supplied. He motivated the farmers to have a killer spirit to get maximum input from the small farms of this area. The FPO should be self sustaining as they have been given sufficient numbers of trainings and exposure visits. They should now stand on their own feet as Govt. support has to be withdrawn gradually in a due course of time. The real result of sustainability would emerge in case the farmers follow the practices as outlined in the brochure given to them.

He suggested that the farmers should add supplementary income sources from dairy, bee-keeping, mushroom so that income of the household is supplemented. He laid lot of stress on the facility of Kisan Credit Cards where a farmer is to pay only 4% interest while from other sources farmers pay heavy interest even up to 24%. He also informed that there is a parallel scheme of Pashu-Kisan Credit Card where farmers can get loan up to Rs.60000/buffalo. Small farmers having very limited holding should opt for this option and get easy term loan for livestock



improvement. He motivated the farmers to become smart, have businessman like mindset and always think of earning profit whether from the purchase of inputs or from the sale of produce. They are to be united in these innovations. The PMIC recommended the release of an amount of Rs.70800/-.At the end, Er.H.S.Lohan thanked the Deputy Director Agriculture, DDM Ambala and the farmers for lively discussion during the PMIC meeting (Photo).



### **Interaction and group discussion with farmers of Chaplana Project 5.2.2020**

This meeting was arranged to discuss the irrigation arrangements for successful vegetable cultivation in the Chaplana and Kharuni settlement. Sh.Anil Walia an Irrigation Expert, visited the village along with Dr.S.S.Grewal and held detailed discussion with the farmers and farm women. First of all, the lined irrigation kuhl was inspected with the farmers and it was observed that the discharge near the inlet of the kuhl is approximately 0.8 cusecs which gets reduced due to seepage and breaches to only 0.2 cusecs near the tank at the tail end. This drastic reduction was mainly due to breaches in the lined canal, cracks in the surface and tilting of one side of the embankment through which lot of water was leaking. The size of the channel is much bigger in the first half of the length and then reduced to almost half due to unexplained reasons. The channel is regularly cleaned by the villagers and there is barabandi for the distribution of water as per the land holding of the farmers.

The bigger tank made at the end of the lined kuhl has developed cracks and lot of water is wasted because of the leakage. The women members of the village suggested that the main cloth washing is done on the bank of the school near village and there no suitable arrangement for proper cloth washing and they desired that a parapet should be made for this purpose. At the backside of the tank, the retaining wall has developed lot of cracks due to which the whole structure is likely to get damaged. They proposed that this retaining wall should be strengthened.

After the inspection of the lined kuhl, a traverse of the cultivated lands was made to understand the water distribution system in the command area. It was noted that on the right side of the cultivated land, an old small size lined kuhl has been made which is profusely leaking and has developed lot of cracks and breaches. Though the discharge is very small but it further gets

reduced in this highly dilapidated condition of the channel. On the left side, the kuhul is unlined and there are lot of seepage losses and needs lining of a fresh kuhul.

After the visit to the fields, a detailed meeting was held where the irrigation related problems of the farmers were discussed and Mr. Anil Walia gave large number of tips on improving the efficiency of irrigation water.



After Chaplana, the team visited Kharuni village and held discussion with the farmers regarding their irrigation problems and the future requirements for improving the irrigation system. Farmers wanted that 108m long 3” dia GI Pipe is required to complete the pipeline work earlier undertaken so as to take it up to the end of the water storage tank. In addition, they suggested that 100m lined kuhul is required to take water from the second source up to the tank. In addition, about 200m lined *kuhul* is required for improving the efficiency of the irrigation system. Here also, the fields were inspected and the importance of land leveling and proper drainage system was suggested for increasing the productivity of the crops.

### **Two Exposure Visit to Harbir Nursery**

A foreign returned progressive farmer Mr Harbir Singh is running a state of the art nursery of vegetable crops over an area of 16 acres. He raise millions of seedlings of best varieties and farmers from Haryana take these seedlings for cultivation. A field visit to his nursery was arranged on 21.12.2019 when 15 farmers from Chaplana visited Harbir Nursery at Dudli Village near Shahbad – Markand. Farmers were highly impressed after visiting nursery. Mr. Harbir Singh is preparing only nursery of different types such of onion, chilies, shimla



mirch, kheera (cucumber), musk melon, tomatoes etc on highly scientific ways perhaps better than any research station. He is doing this on 16 acres area may be the biggest scientific nursery in the country. He is raising seedlings in tunnels and green house well designed by him. His main



success is medium of nursery a 3inch thick mixture laid on raised beds of about 2 acres length each. His medium is equal amount of fine sand burnt rice husk, FYM and irrigation by small sprinklers. He also keeps all records of each variety, its date of sowing and harvest with size of plants and their characteristics. He raised about 50 varieties of each crops. He exports seedlings to many states and Italy and Holland. Many breeders and VIPs visited his farm. He has full records of all rates of growth and pesticides. He has special material of tunnels along with clothes. After field visit, a group discussion was also arranged. Our farmers purchased seedlings of some vegetable crops.

### **Second visit to Harbir Nursery**

Since only 15 farmers could join in this visit, the DDM Ambala suggested that the remaining members of the project should also be benefitted by organizing another exposure visit. So another exposure visit was arranged for remaining farmers on January 18, 2020. Here again field visit to nursery plots was followed by a very fruitful discussion. Many farmers suggested that we should have a similar nursery in Morni area for the hill farmers





## **CROP PRODUCTION RESULTS**

### **Analysis of Crop Production Data**

After the harvest of demonstration and control plots, the ginger rhizomes were cleaned of earth and weighed separately for each demonstration and control plot. The data of 31 farmers was compiled except one farmer whose crop was completely damaged. See annexure II for more detail,

It was noted that the average production of treated plots was 776 kg of new rhizomes and 156 kg of old rhizomes used as sees making a total of 932 kg/bigha. In case of control plots, the average production was 504 kg of new rhizomes and 77 kg of old hizomes thus making a total of 581 kg. The control data pertains to 26 farmers and rest five farmers had crop on only one bigha of treated plots. They had only one plot of land. The average improvement in production of new bulbs is (776-504) 272 kg indicating 54% increase over control. When taking old and new combined, the increase is (932-581) 351 kg which amounts to increase of 60.4 percent. It is also clear that old bulbs were on average 156 kg in treated and only 77 kg in control. This clearly indicated that the farmers were using much less seed of ginger and hence low production.

### **Yield Potential**

It is interesting to note the high variability in production levels of farmers in spite of the fact that same type of inputs were added in all the demonstration plots. The yield level is as high as 1000kg/bigha of new bulbs in case of Sh. Lekh Singh and as low as 550kg/bigha in case of Smt. Sarda Devi and 600kg/bigha in case of Smt.Isro Devi(Annexure II).

Similarly while comparing control versus treated plots, there is huge variation in the yield of same farmer. For example, in case of Sh.Kalayan Singh , the treated plot yield of new bulbs was 810 and only 286 kg/bigha in untreated control thus registering 183 percent increase. There were farmers who recorded more than 100% increase in yield of new bulbs though the overall average increase was 54 percent indicating huge potential waiting for realization. There were six farmers who recorded only 20 to 30 percent increase in new bulb production. The discussions with the farmers revealed several factors discussed in the following text.

### **Comparison with previous year production**

In the village, a thumb rule is followed to estimate the yield potential. The rule is that if you sow one kilogram of seed, how many kilograms of fresh bulbs one gets. This ratio between seed used and fresh valve yield is fairly a good indicator of yield potential. Using the same analogy, the data of seed used and yield got from one bigha was compiled from all the farmers and compared with this year demonstration plots ratio( See annexure – IV).

Farmers generally use 160 to 200 kg of seed per bigha. In case of A category of farmers producing more than 800 kg/bigha mostly used 200kg of seed per bigha. The ratio between seed

used and production of new bulbs was 4:1 in A class and in B category of farmers producing between 700 to 800kg/bigha, such a ratio was 3.95 and for C class farmers producing less than 700kg/ bigha of new bulbs, the ratio was 3.74. The comparable figures for the last year crop of ginger was 2.50, 2.52 and 2.94 respectively indicating 68, 45 and 38 percent increase in new bulb production over the last year.

There has been very high variability in the crop production with the same level of input. Some of the probable reasons based on discussion with farmers are given below.

- a) There is very high variability in terms of drainage of excess water during rains. The field having no accumulation of water for long and rainwater gets drained quickly produced more yield. In some of the low lying fields, quick drainage was not possible and yield was low.
- b) There were inherent differences in the fertility levels of the fields. For example, in case of Sharda Devi which recorded lowest yield, the OC, K<sub>2</sub>O and Manganese were quite low. By and large at medium to high level of production, nutrients availability was no constraint as vermi-compost and neem cake were added.
- c) Since seed of ginger was not provided by the project but farmers added the same amount of seed but quality of seed was variable. Good, healthy, disease free seeds produced maximum yields.
- d) Another reason was that some of the farmers who were engaged in some jobs outside the village could not meticulously attend to spray schedules. The timely application of nutrients and timely spray is important and farmers must be present to attend to those timely operations.

### **Net Benefits**

The cost of all the additional inputs supplied through the project for seed treatment, chemical sprays and fertilizers was Rs.181829/- and for 32 farmers it was Rs.5682/bigha/farmer. When we take the increase of 272 kg of new bulbs of ginger and after processing the *saunth* is normally 18% of dried bulbs. This would come to 48.96kg of *saunth* from 272 kg bulbs and at the present rate of Rs.400/kg of normal quality *saunth*, the income comes to Rs.19584/-. So with an investment of additional Rs.5682/- on added inputs, the added benefit was Rs.19584/- giving benefit cost ration of 3.44. It is evident that the project has achieved the set objectives of demonstrating the impact of innovative technology transfer. This example needs replication on large scale. No doubt there was chemical pesticide application in this package but the efficacy of bio pesticides for disease management in ginger and recommendation from SAUs was not available and should be tried and tested.

The main results have been given in Annexures.

## FINANCIAL STATEMENT OF THE PROJECT

Out of the total cost of the project of Rs 972240, the farmer's contribution was Rs 205752 and NABARD Share was Rs 766488. Out of this, institutional share was Rs 85349 which is 20% of actual release of funds ( Table).

**Table: Details of amount released and actual expenditure and balance till date (Rs)**

Sl. No	Particulars	Amount sanctioned)	Amount Released	Expenditure up to 31.03.2020	Balance
1	Pipeline for irrigation including material	194448	194448	194448	0
2	Technology transfer through training, workshops and exposure visits	110000			
	2.1 Compilation of booklet	10000	10000	10000	0
	2.2 Discussion in village on issues and action points with resource persons, 10 nos., @2000 each	20000	12000	12215	-215
	2.3 Exposure visits to advance centres on vegetable cultivation techniques, progressive FPOs, 2 nos., 15000 each)	30000	15000	25432	-10432
	2.4 Honorarium to resource persons, 10 visits, (10 visits @Rs.1500/day, two persons)	30000	14000	10000	4000
	2.5 Travel cost 10 visits (@Rs.2000/visit)	20000	12000	19260	-7260
	<b>Sub Total</b>	<b>110000</b>	<b>63000</b>	<b>83907</b>	<b>-20907</b>
3	One resource person for logistical arrangements, data collection, coordination (@Rs.5000/month for 12 months)	60000	30000	50000	-20000
		60000	30000	50000	-20000
4	Cost of innovative package of practices-add on cost, for 32 bighas	240000			
	4.1 Cost of seed treatment before planting @700/bigha	22400	22400	21580	820
	4.2 Cost of soil sterilization with black polythene sheet @1000/bigha	32000	32000	32025	-25
	4.3 Cost of bio-fertilizer, NPK and micro-nutrients on soil test basis @Rs.3000/bigha	96000	96000	43744	52256
	4.4 Cost of Trichoderma and neem cake @Rs.800/bigha	25600	25600	63360	-37760
	4.5 Plant protection cost @Rs.2000/bigha	64000	64000	21120	42880
	<b>Sub Total</b>	<b>240000</b>	<b>240000</b>	<b>181829</b>	<b>58171</b>
	<b>Available for project activities</b>	<b>604448</b>	<b>527448</b>	<b>510184</b>	<b>17264</b>
5	Support to implementation agency @20% of cost (20% of Particulars (1+2+3+4+6))	162040	25549 48000 <u>11800</u> <b>85349</b>	25549 48000 <u>11800</u> <b>85349</b>	
	<b>Total Grant Support</b>	<b>766488</b>	<b>612797</b>	<b>595533</b>	<b>17264</b>
6	Farmer contribution	205752			
	<b>Total Cost of the project</b>	<b>972240</b>			



## ANNEXURE-I

Table: List of vegetable growers and area under vegetables - Village Chaplana and, Kharuni

Sr. No	Name	Father/Husband's Name	Total Area (acre)	Area under Ginger cultivation (acre)
1	Balak Ram	Jammu Ram	8	3
2	Lekh Singh	Hari Singh	1	0.5
3	Poonam Devi	w/o Baldev Singh	1.5	0.5
4	Virender Singh	Madan Singh	2	1
5	Maan Singh	Hem Ram	4	2
6	Pawan Kumar	Sunder Singh	3	2
7	Hem Ram	Hira Singh	2	1
8	Jeet Singh	Hira Singh	2	1
9	Ram Singh	Hira Singh	2	1
10	Gulab Singh	Hem Ram	4	2
11	Kishan Singh	Dhyan Singh	2	1.5
12	Narata Ram	Baru Ram	4	2
13	Multan Singh	Pat Ram	3	1.5
14	Dindyal Singh	Bhagat Ram	6	3
15	Lekh Singh	Khushi Ram	7	3
16	Balwant Singh	Bhagat Ram	6	3
17	Pratap Singh	Baru Ram	4	2
18	Ram Singh	Amar Singh	3	1.5
19	Acchar Singh	Baru Ram	4	2
20	Tulsi Ram	Shankar Das	5	3
21	Surender Singh	Pat Ram	3	2
22	Babu Ram	Dhyan Singh	2	1
23	Ranjit Singh	Dhyan Singh	2	1
24	Hukam Singh	Lekh Raj	3	1.5
25	Charan Singh	Lekh Raj	3	1.5
26	Sardar Singh	Prithvi Singh	3	2
27	Ishro Devi	w/o Devender Singh	3	2
28	Kalyan Singh	Amar Singh	3	2
29	Anant Ram	Khushi Ram	6	3
30	Satpal Singh	Hira Singh	4	2
31	Munshi Ram	Shankar Das	5	3
32	Sharda Devi	w/o Het Ram	5	3
		<b>Total</b>	<b>115.5</b>	<b>60.5</b>
		<b>Mean</b>	<b>3.61</b>	<b>1.89</b>

It may be noted that more than 90 % farmers fall in small and marginal category.

**ANNEXURE – II**

**Table: Increase in production of Ginger in treated plots over control in Village Chaplana / Khruni**

Sr. No	Name of Farmer	TREATED			CONTROL			Increase over Control(Kg)	% increase over Control
		Production Kg			Production kg				
		New	Old	Total	New	Old	Total		
1	Sh. Kishan Singh	780	150	930	675	75	750	180	24
2	Smt. Poonam Devi	760	150	910	400	50	450	460	102
3	Sh. Babu Ram	790	160	950	570	80	650	300	46
4	Sh. Ranjeet Singh	700	150	850	450	80	530	320	60
5	Sh. Kalyan Singh	810	190	1000	286	70	356	644	181
6	Sh. Anat Ram	700	170	870	350	50	400	470	118
7	Sh. Hukam Singh	750	150	900	345	50	395	505	128
8	Sh. Charan Singh	770	160	930	600	60	660	270	41
9	Smt. Ishro Devi	600	160	760	400	60	460	300	65
10	Sh. Lekh Singh	1000	180	1180	510	100	610	570	93
11	Sh. Deendayal	770	160	930	500	50	550	380	69
12	Sh. Pawan Kumar	900	160	1060	407	50	457	603	132
13	Sh. Balwant Singh	800	150	950	428	45	473	477	101
14	Sh. Multan Singh	900	170	1070	750	125	875	195	22
15	Sh. Surender Singh	920	170	1090	600	100	700	390	56
16	Sh. Narata Ram	800	165	965	625	125	750	215	29
17	Sh. Partap Singh	820	175	995	382	90	472	523	111
18	Sh. Virender Singh	650	150	800	550	60	610	190	31
19	Sh. Ram Singh	800	150	950	560	100	660	290	44
20	Sh. Achhar Singh	680	150	830	580	80	660	170	26
21	Sh. Hem Ram	800	150	950	406	60	466	484	104
22	Sh. Ram Singh	810	160	970	575	40	615	355	58
23	Sh. Lekh Singh	670	150	820	600	80	680	140	21
24	Sh. Balak Ram	750	140	890	610	140	750	140	19
25	Sh. Munshi Ram	800	160	960	500	100	600	360	60
26	Sh. Satpal	770	155	925	430	90	520	405	78
27	Sh. Gulab Singh	810	160	970					
28	Sh. Man Singh	820	165	985					
29	Sh. Tulshi Ram	790	150	940					
30	Sh. Sardar Singh	775	160	935					
31	Smt. Sarda Devi	550	70	620					
	<b>Average</b>	<b>776</b>	<b>156</b>	<b>932</b>	<b>504</b>	<b>77</b>	<b>581</b>	<b>351</b>	<b>60</b>
	Sh. Jeet Singh	500	110	610	575	130	705	-95	-13
<b>NOTE:</b>	In case of Jeet Singh of Chaplana the crop was damaged because of the highly infected seed he used and the seed was such a poor quality that there was rotting in the seed and could not respond to the treatment.								

**ANNEXURE – III**

**Table: Section wise increase in production of ginger in treated plots over control in village  
Chaplana / Kharuni**

Sr. No.	Growers Class	Farmer's Name	TREATED			CONTROL			Increase over control (Kg)	% increase over Control
			Production Kg			Production kg				
			New	Old	Total	New	Old	Total		
1	A	Sh. Lekh Singh	1000	180	1180	510	100	610	570	93
2		Sh. Surender Singh	920	170	1090	600	100	700	390	56
3		Sh. Pawan Kumar	900	160	1060	407	50	457	603	132
4		Sh. Multan Singh	900	170	1070	750	125	875	195	22
5		Sh. Partap Singh	820	175	995	382	90	472	523	111
6		Sh. Man Singh	820	165	985					
7		Sh. Kalyan Singh	810	190	1000	286	70	356	644	181
8		Sh. Ram Singh	810	160	970	575	40	615	355	58
9		Sh. Gulab Singh	810	160	970					
10		Sh. Balwant Singh	800	150	950	428	45	473	477	101
11		Sh. Narata Ram	800	165	965	625	125	750	215	29
12		Sh. Ram Singh	800	150	950	560	100	660	290	44
13		Sh. Hem Ram	800	150	950	406	60	466	484	104
14		Sh. Munshi Ram	800	160	960	500	100	600	360	60
		<b>Mean</b>	<b>842</b>	<b>165</b>	<b>1007</b>	<b>502</b>	<b>84</b>	<b>586</b>	<b>426</b>	<b>83</b>
15	B	Sh. Babu Ram	790	160	950	570	80	650	300	46
16		Sh. Tulshi Ram	790	150	940					
17		Sh. Kishan Singh	780	150	930	675	75	750	180	24
18		Sh. Sardar Singh	775	160	935					
19		Sh. Charan Singh	770	160	930	600	60	660	270	41
20		Sh. Deendayal	770	160	930	500	50	550	380	69
21		Sh. Satpal	770	155	925	430	90	520	405	78
22		Smt. Poonam Devi	760	150	910	400	50	450	460	102
23		Sh. Hukam Singh	750	150	900	345	50	395	505	128
24		Sh. Balak Ram	750	140	890	610	140	750	140	19
25		Sh. Ranjeet Singh	700	150	850	450	80	530	320	60
26	Sh. Anat Ram	700	170	870	350	50	400	470	118	
		<b>Mean</b>	<b>759</b>	<b>155</b>	<b>913</b>	<b>493</b>	<b>73</b>	<b>566</b>	<b>343</b>	<b>68</b>
27	C	Sh. Achhar Singh	680	150	830	580	80	660	170	26
28		Sh. Lekh Singh	670	150	820	600	80	680	140	21
29		Sh. Virender Singh	650	150	800	550	60	610	190	31
30		Smt. Ishro Devi	600	160	760	400	60	460	300	65
		<b>Mean</b>	<b>650</b>	<b>153</b>	<b>803</b>	<b>533</b>	<b>70</b>	<b>603</b>	<b>200</b>	<b>36</b>
31	D	Smt. Sarda Devi	550	70	620					
		<b>Overall Mean</b>	<b>776</b>	<b>156</b>	<b>932</b>	<b>504</b>	<b>77</b>	<b>581</b>	<b>351</b>	<b>60</b>
		Sh. Jeet Singh	500	110	610	575	130	705	-95	-13
<b>NOTE:</b>		<b>In case of Jeet Singh of Chaplana the crop was damaged because of the highly infected seed he used and the seed was such a poor quality that there was rotting in the seed and could not respond to the treatment.</b>								



**ANNEXURE – IV**

**Table : Production with one bigha of seed used and ratio of seed used and production during 2018-19 and 2019-20**

Sr. No	Farmer's Name	Father's Name	Village	Production	Seed	Ratio	
				New (kg)		2019-20	2018-19
1	Sh. Lekh Singh	Sh. Khushi Ram	Chaplana	1000	200	5.00	2.55
2	Sh. Surender Singh	Sh. Pat Ram	Chaplana	920	200	4.60	3.00
3	Sh. Pawan Kumar	Sh. Sunder Singh	Chaplana	900	200	4.50	2.37
4	Sh. Multan Singh	Sh. Pat Ram	Chaplana	900	200	4.50	3.75
5	Sh. Partap Singh	Sh. Baru Ram	Chaplana	820	200	4.10	1.91
6	Sh. Man Singh	Sh. Hem Ram	Chaplana	820	200	4.10	
7	Sh. Kalyan Singh	Sh. Amar Singh	Kharuni	810	200	4.05	1.43
8	Sh. Ram Singh	Sh. Hira Singh	Chaplana	810	200	4.05	2.37
9	Sh. Gulab Singh	Sh. Hem Ram	Chaplana	810	200	4.05	
10	Sh. Balwant Singh	Sh. Bhagat Ram	Chaplana	800	200	4.00	2.14
11	Sh. Narata Ram	Sh. Baru Ram	Chaplana	800	200	4.00	3.12
12	Sh. Ram Singh	Sh. Amar Singh	Chaplana	800	200	4.00	2.80
13	Sh. Hem Ram	Sh. Hira Singh	Chaplana	800	200	4.00	2.03
14	Sh. Munshi Ram	Sh. Sankar Das	Kharuni	800	200	4.00	2.50
	<b>A class growers</b>		<b>MEAN</b>	<b>842</b>	<b>200</b>	<b>4.21</b>	<b>2.50</b>
15	Sh. Babu Ram	Sh. Dayan Singh	Chaplana	790	200	3.95	2.85
16	Sh. Tulshi Ram	Sh. Sankar Das	Chaplana	790	200	3.95	
17	Sh. Kishan Singh	Sh. Dayan Singh	Chaplana	780	200	3.90	3.37
18	Sh. Charan Singh	Sh. Lekh Raj	Kharuni	770	200	3.85	3.00
19	Sh. Deendayal	Sh. Bhagat Ram	Chaplana	770	200	3.85	2.50
20	Sh. Satpal	Sh. Hira Singh	Kharuni	770	200	3.85	2.15
21	Smt. Poonam Devi	W/o Baldev Singh	Chaplana	760	200	3.80	2.00
22	Sh. Hukam Singh	Sh. Lekh Raj	Kharuni	750	200	3.75	1.72
23	Sh. Balak Ram	Sh. Jammu Ram	Chaplana	750	160	4.68	3.05
24	Sh. Ranjeet Singh	Sh. Dayan Singh	Kharuni	700	160	4.37	2.82
25	Sh. Anat Ram	Sh. Khushi Ram	Kharuni	700	200	3.50	1.75
	<b>B class growers</b>			<b>757</b>	<b>193</b>	<b>3.95</b>	<b>2.52</b>
26	Sh. Achhar Singh	Sh. Baru Ram	Chaplana	680	160	4.25	2.87
27	Sh. Lekh Singh	Sh. Hari Singh	Chaplana	670	160	4.18	2.84
28	Sh. Virender Singh	Sh. Madan Singh	Chaplana	650	160	4.06	3.55
29	Smt. Ishro Devi	W/o Devender	Kharuni	600	160	3.75	2.51
	<b>C. class growers</b>			<b>650</b>	<b>160</b>	<b>4.06</b>	<b>2.94</b>