

FIVE YEARS OF GSFRED

ACTIVITIES AND ACHIEVEMENTS



**GURBACHAN SINGH FOUNDATION FOR RESEARCH
EDUCATION AND DEVELOPMENT**

Karnal -132001



FIVE YEARS OF GSFRED

ACTIVITIES AND ACHIEVEMENTS

Gurbachan Singh



Published by :

Chairman, Gurbachan Singh Foundation for Research, Education and Development (GSFRED)

14 Milestone, Karnal-Kaul-Pehowa Road, State Highway-9, Karnal-132001, India

Email: info.gsfred.in@gmail.com | Website: www.gsfred.in

Citation:

Singh, Gurbachan (2023). Five Years of GSFRED: Activities and Achievements. Gurbachan Singh Foundation for Research, Education and Development, Karnal 34 Pages

2023

No part of this manuscript may be reproduced, stored in a retrieval system or transmitted to any form or by any means without written permission from the publisher

PREFACE



I retired on May 26, 2017 after serving Indian Council of Agricultural Research (ICAR) and Ministry of Agriculture and Farmers Welfare, Govt. of India. During my almost 40 years of professional career, I had the opportunity to serve as Chairman, Agricultural Scientists Recruitment Board (ASRB), Agriculture Commissioner, Govt. of India; Director, CSSRI, Karnal; ADG (Agronomy), ICAR, Head, Crop Production Division, Indian Grassland and Fodder Research Institute, Jhansi and active researcher at CSSRI, Karnal and National Research Centre on Agroforestry, Jhansi. After retirement, there were two options (i) to continue serving post retirement as a job seeker or (ii) establish own set up to continue interest in agricultural research, education and development. I preferred option second considering a better way to pay back to the society after retirement.

The Gurbachan Singh Foundation for Research, Education and Development (GSFRED) was launched during the Thanks Giving party organised on November 20, 2017 attended by more than 250 persons including scientists, research and development managers, civil society representatives, progressive farmers, family members, friends and well wishers. The Foundation was launched with a mission to promote upscaling of scientific innovative interventions in agricultural sciences for skill and entrepreneurship development in farmers, unemployed rural youth and students to contribute towards achieving Sustainable Development Goals (SDG`s) of alleviation of poverty, malnutrition, unemployment, illiteracy and conservation of natural resources for safe environment.

For creation of state of the art facilities to achieve the mission, I invested my pension funds received at the time of retirement, personal savings of my family and loans from the bank. With the blessings of Almighty and good wishes of colleagues and friends, the minimum infrastructure for research, training and development has been created during last five years.

The various activities and achievements of the Foundation during last five years are compiled in this publication. The topics covered included : Infrastructure and facilities created, original soil and water quality analysis of experimental farm ; research and technology demonstrations such as integrated farming system model, climate smart agricultural practices, water saving and soil rejuvenation techniques, evaluation of crop varieties for location specific suitability and resilience to climate change, crop diversification options for rice- wheat system, fruit based agroforestry, rice residue management strategy, production of quality seeds and saplings, creation of awareness about safe food, organic and natural farming practices etc.

During last five years, the centre has come up as an agro - eco-tourism site. Large number of students, farmers, civil society members visit the centre almost daily. Various other activities incorporated in this publication include list of national and international visitors, farmers, stake holders, students and civil society representatives who visited the research station during last five years.

I hope and believe that this compilation will be useful to the stake holders for contributing towards achieving Sustainable Development Goals.

We will look forward for suggestions from the readers.



Gurbachan Singh

Founder Chairman

ACKNOWLEDGMENTS

I feel pleasure in placing on record the moral, physical and financial support provided by my family members wife Harjit, sons Tanvir and Mansimar and daughter in laws Tarinder and Anna for establishing the Foundation.

I thank Dr. Randhir Singh, Chief Technical Officer, GSFRED for his help in reading several drafts of the manuscript and also for liaison with the press. I also thank Mr. Madan Singh Former Assistant Chief Technical Officer, CSSRI, Karnal for his unconditional support of art and designing work of this publication. The help of Mr. Brijesh Thakur, my Personal Secretary for typing and page setting of the book is gratefully acknowledged. I also thank Aaron Media, Karnal for timely publication.



GURBACHAN SINGH

Contents

	Page
Preface	(i)
Acknowledgments	(ii)
1. Launch of Foundation	1
2. Mission	1
3. Objectives	1
4. Infrastructure and Experimental Facilities	2
5. Original Soil Properties and Ground Water Quality Analysis of Experimental Farm	2
6. Research Themes and Activities	3
7. Celebrations	13
8. International and National Visitors	17
9. Visits of Farmers and Stakeholders	22
10. Visits of School Students	23
11. Chairman's Visits to National and International Research Centres/Organizations	24
12. Ph.D Students and Internship Trainees	27
13. Stone Laying Ceremony of GSFRED, Main Building	27
14. MOU Signed	28
15. GSFRED Publications	28
Founder Chairman Biography	29

FIVE YEARS OF GSFRED

Activities and Achievements

1. LAUNCH OF FOUNDATION

The Gurbachan Singh Foundation for Research, Education and Development (GSFRED) was launched during the Retirement Thanks Giving function of the Founder Chairman on 20 November, 2017. The launch function was

attended by more than 250 persons including scientists, directors of ICAR institutes, vice chancellors, development and policy experts, civil society representatives, progressive farmers and students.



2. MISSION

“To promote upscaling of scientific innovative interventions for skill and entrepreneurship development amongst rural youth including women, farmers and students to contribute towards achieving Sustainable Development Goals (SDG's) of alleviation of poverty, illiteracy, malnutrition, unemployment and conservation of natural resources for safe environment”

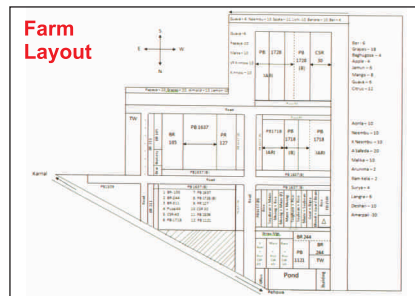
3. OBJECTIVES

- To create scientific temperament in students by providing them an opportunity of training and visit to laboratories and field experiments.
- To establish state of the art laboratories, experimental farms for demonstration of scientific interventions and centres of excellence for skill and entrepreneurship development.
- To foster collaboration with research and educational organizations at regional, national and international levels, to promote research, education and development activities.
- Preparation and submission of need based research, education and developmental projects for competitive grants from national and international donors engaged in research, education and extension activities.
- To provide consultancy service and policy advice in agricultural research, education and development.
- To act as a platform for accelerating public-private partnerships at home and at abroad to achieve objectives of the Foundation
- To establish demonstrations to promote the adoption of national and state government programs such as doubling farmers income, crop diversification, water conservation, soil health improvement, safe food, organic and natural farming, integrated farming systems, climate smart agriculture practices and agroforestry.
- To organize seminars, symposium, workshops, brain storming sessions, group meetings, exhibitions, declamations and debates, to share knowledge and exchange ideas for popularization of scientific and educational innovations.
- To publish books, bulletins, journals, reports and newsletters to share Foundation activities and programmes with scientific community, development departments /agencies, policy managers, farmers and students.
- To establish need based educational and training facilities/centres to provide quality education for quality human resource development

4. INFRASTRUCTURE AND EXPERIMENTAL FACILITIES

About seven acre reclaimed sodic land at 14 milestone on Karnal-Pehowa State Highway, near Kachhwa Town was purchased in 2018 to establish state of the art facilities to achieve objectives of the Foundation. The facilities created included development of an experimental farm, conference hall, seminar room, laboratories, museum, library, rooms for scientists, committee room, dining hall with attached kitchen,

chairman's office, godowns for seed processing and storage, animal sheds, fish pond and outlet etc. The Founder Chairman established these facilities using his retirement benefits and personal savings of the family. He is spending his monthly pension to pay wages of the staff employed at the centre. The mission is to continue his interest in research and academics and pay back to the society after retirement.



5. ORIGINAL SOIL PROPERTIES AND GROUND WATER QUALITY ANALYSIS OF EXPERIMENTAL FARM

Two profiles were dug out upto 180cm depth to analyze soil properties of the experimental farm. The profiles were characterized with the help of scientists from CSSRI, Karnal. For the examination of physico-chemical properties, soil samples were taken at an interval of 15cm from the surface upto 180cm depth. The analysis is reported in Table 1. There was a gradual increase in pH of the soil with depth. Beyond 45cm depth, the pHs of the soil is quite high and not suitable for growing salt sensitive crops. The electrical conductivity is well within the normal range (< 4.0 dS/m) for growing most crops and representing non-saline character. Except the above 45cm soil layer, the organic carbon content is very low throughout the profile. Calcium carbonate

content in the form of granules is present throughout the profile indicating the character of caliche bed between 90 to 130cm depth.

Visual observations indicated very low water infiltration rate and deflocculated muddy water condition after rain or irrigation where surface soil was removed and lower layer soil was spread along the dikes of a pond dug out for rearing fishes. The soil analysis clearly represents the characteristics of a surface reclaimed alkali soil.

Continuous use of rotavator machine for growing crops for last several years made the sub-surface layers so compact and hard restricting free flow of water into the deeper layers. The ground water quality for irrigation as


Table 1 : Original Properties of the Experimental Soil

Profile I								Profile II						
Depth (cm)	pHs	ECe (dS/m)	OC (%)	Na ⁺ (meq/l)	K ⁺ (meq/l)	Ca+Mg (meq/l)	CaCO ₂ (%)	pHs	ECe (dS/m)	OC (%)	Na ⁺ (meq/l)	K ⁺ (meq/l)	Ca+Mg (meq/l)	CaCO ₂ (%)
0-15	8.42	1.52	0.45	13.61	0.13	12.0	1.22	8.55	1.68	0.45	8.62	0.04	11.0	1.02
15-30	9.24	1.29	0.22	12.74	0.07	20.0	0.66	9.45	1.12	0.29	5.41	0.04	10.0	0.41
30-60	9.56	1.61	0.13	15.92	0.06	12.5	0.94	9.88	1.32	0.13	6.92	0.03	8.5	1.09
60-90	9.64	1.69	0.13	15.80	0.04	11.5	1.10	10.02	1.28	0.27	6.75	0.05	11.5	1.98
90-120	9.63	1.48	0.11	11.69	0.03	9.5	0.92	10.00	1.65	0.12	5.04	0.03	10.5	1.45
120-180	9.87	1.64	0.14	9.02	0.04	9.0	1.93	10.10	2.26	0.12	9.57	0.02	11.0	6.18

evidenced from tubewell water analysis (Table 2) is slightly sodic and suitable for irrigating crops. However, may need application of gypsum as per requirement to neutralize residual sodium carbonate.

A new tubewell was installed to meet drinking water need. The depth wise samples were taken to ascertain the water quality upto 250 feet. The analysis report is given in Table 3.

Table 2 : Tubewell Water Sample Analysis

EC(dS/m)	PH	CO(meq/l)	HCO ₃ (meq/l)	Ca+Mg(meq/l)	RSC(%)
0.82	8.03	NIL	7.0	4.3	2.7

Table 3 : Depth wise Analysis of Tubewell water

Depth (ft.)	EC	pH	CO ₂	HCO ₃	Ca+Mg	RSC
0-50	0.66	6.78	Nil	5.8	4.6	1.2
50-100	0.84	6.80	Nil	7.4	4.2	3.2
100-150	0.81	6.79	Nil	7.4	3.6	3.8
150-200	0.73	6.65	Nil	6.8	4.0	2.8
200-250	0.61	6.69	Nil	6.0	3.6	2.4

Well laid out experiments were established after acquisition of the land in 2018 to address current problems of agriculture such as doubling farmers income, crop diversification, residue management

climate smart agro-techniques, water conservation and soil rejuvenation, organic agriculture, natural farming etc. At present there are 3 Sahiwal, 2HF and 1 Murrah heifer buffalo in addition to five adult animals.

6. RESEARCH THEMES AND ACTIVITIES

6.1. Integrated Farming System Model For Food, Nutrition, Livelihood and Environmental Security Of Small and Marginal Land Holder Farmers

An integrated farming system model was established to double farmers income by making multiple use of

resources and inputs. Various components of the farming system model such as fisheries, dairy, goatery, poultry, fruit trees, vegetables, food and feed crops have been blended in such a way on 2 acre of land so that all requirements of a family of 5 to 6 persons are met and

daily income of about Rupees 2000 is generated. The concept is based on reducing cost of cultivation via in-situ generation of manure by blending animal excreta with farm waste and crop residues. A gobar gas plant has also been established to meet energy requirement of cooking and lighting. A part of the cow dung is used in gobar gas plant, a small part as feed to fish in the pond and rest decomposed with farm waste to generate manure for the crops. The nutrient rich fish pond water is recycled for irrigating field crops to reduce fertilizer use and cost. The fruit plants such as peach, plum, guava, pomegranate, apricot, fig, lemon and citrus planted on the dyke of the pond are contributing to daily income. Similarly, a part of the land used for year round growing of vegetables is also serving as daily source of income. Half of the land is used for growing green fodder, feed, pulses, oil seeds and cereal crops like rice and wheat to meet domestic need. The four years preliminary observations revealed as under:

- The dairy component started with 3 cows (2 HF and 1 Sahiwal), and one Murrah buffalo is generating maximum returns. The number of cattle increased to 11 including 5 heifers.
- The goatery component was introduced with five female and one male costing Rs. 70000. Over the period, 16 goats were sold for Rs. 128000. The expenditure on rearing of goats is almost negligible. Their fodder and feed requirement was fully met through the daily vegetable/fruit waste and other bio-mass generated at the farm.
- Blending of poultry component was not very encouraging due to feed cost and unexpected mortality of the birds. However, introduction of Desi breeds like Kadaknath and RIR proved promising.
- Gobar gas plant proved sufficient to meet domestic energy requirement of 4 to 6 adults. The decomposed manure generated within the system was sufficient to meet 50% requirement for nutrition of fruits, vegetables and other crops.
- Synergetic combination of system components resulted in reducing cultivation cost by more than 50 percent and increasing farmer income by two to three times.
- A way forward for natural farming/organic agriculture, house hold level food and nutritional security and resilience to climate change impacts.
- Detailed economics (direct and indirect benefits) is being worked out on yearly basis



6.2 Climate Smart Agricultural Practices

Nearly 90% cultivated area in North-west India comprising the food bowl states of Punjab, Haryana and Western Uttar Pradesh is cultivated with rice and wheat crops grown in a sequence. This cropping system over the years has resulted in drawdown of ground water, deterioration in soil quality and enhanced release of green house gases. A long term experiment has been initiated at the experimental farm to find the alternative less water requiring crops and their management practices to replace rice and wheat, the two water guzzling crops. The alternate crops being tried during Kharif (June-October) included treatments: sole maize, sole soybean, maize and soybean on raised bunds and rice in the furrows, ladyfinger on bunds and spinach in furrows. Similarly during Rabi (October to May) sole wheat on bunds, wheat on bunds and winter-maize in furrows, mustard on bunds; and cauliflower on bunds and fenugreek in furrows. The soil of the experimental



site is reclaimed sodic soil having high pH in the subsurface layers, low in organic matter and available nitrogen, medium in phosphorus and potash. The quality of the tube well water used for irrigation was normal. The results indicated that maize and soybean during *kharif* and mustard, gram and lentil in *rabi* have the potential to replace part of the area currently under rice-wheat cultivation in North-west India. Following ridge-furrow planting techniques helped to save about 30% irrigation water and also two crops are possible with the same quantity of water. Growing legume and cereal crop together helped to build up soil fertility in terms of increased organic carbon and available nutrients. Planting chickpea and lentil on bunds and winter-maize (a crop highly sensitive to frost during winter) in furrows provided resilience to maize during establishment stage and the crop escaped frost damage cold/wave impact which is usual in winter in north-west India.



6.3 Saving Water And Rejuvenating Soil In Rice-Wheat Cropping Sequence: GSFRED Model

The Issue

Ever since the green revolution of 1960's, rice-wheat cropping rotation became highly popular with the farmers of north-west India. These crops made country self sufficient in food grains production and exports

increased over the years. During last five decades, the eco-friendly crops of the region like cotton, maize, millets, pulses and oilseeds etc. were replaced with rice and wheat. At present, nearly 90% area in Punjab and Haryana is occupied by this cereal rotation. Continuous cultivation of rice and wheat over long period resulted in drawdown of ground water,

deterioration in soil health, loss of biodiversity, issues of environmental concern associated with large scale burning of residues of these crops. Lot of emphasis by the centre and state governments and research and policy experts to diversity from rice-wheat to maize, soybean, cotton, pulses, oilseeds, vegetables and fruits did not succeed. Rice-wheat cropping sequence is the first choice with the farmers even today.

GSFRED Initiative

After the establishment of GS Foundation in 2017, several experiments and demonstrations were laid-out focusing on the concept of making rice-wheat system sustainable and eco-friendly. Three years results clearly indicated that desired reduction in water use, improvement in soil health, regeneration of biodiversity and in-situ use of crop residues is possible through agronomic manipulations. The innovative technology package developed at the centre is summarized below:

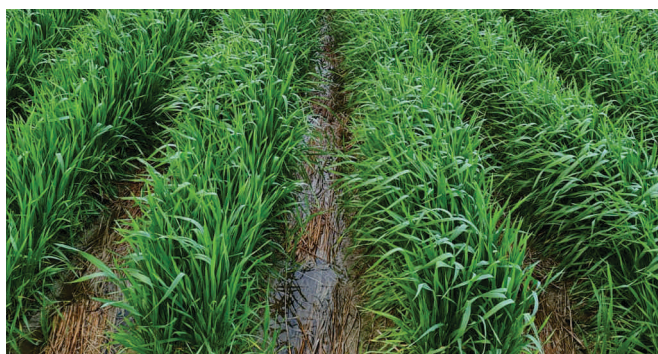
1. Sowing of wheat on raised bunds and placing harvested rice residue in furrows, saves water by 20 – 30%, controls Mandusi (Phalaris minor) and other weeds, conserves excess rain water in-situ, ensures minimum adverse impact on wheat due to submergence and lodging and better microclimate for soil microbes to flourish. Wheat planted on ridges gives almost same and even more yield than sown on flat surface and escapes lodging.
2. After harvest of wheat manually or by combine, short duration moong (green gram) is sown on the same bunds without cultivation. The moong crop gives 3-5 q/ acre yield and enriches the soil

with nitrogen and other nutrients. The left over rice residue from the previous season is again added in furrows to save water, control weeds and to provide congenial microclimate to improve physical, chemical and biological properties of the soil.

3. Before rice cultivation, the field is ploughed to incorporate left over residue present in furrows. The rice crop can be sown direct seeded or transplanted without puddeling. Alternately, rice can also be planted on the same bunds without disturbance of the soil. Short duration varieties of rice like PB1509, PR126, PB1692, PB7, PB1847 etc. should be transplanted between 15 to 30 July. This practice results in saving of water by about 20-30 percent. About 85% small and marginal farmers in the region may not need heavy costly machinery for residue management at their small holdings. The rice residue management in this way will save water and improve soil health. A part of the subsidy provided to farmers for purchase of heavy machinery to manage rice residue can be diverted to promote this conservation agriculture practice.



Stand of green gram crop variety SML 832 sown on undisturbed bunds



Growth of wheat crop on raised bunds and furrows filled with rice residue.





4. Large number of research managers, policy experts, scientists, farmers and civil society representatives visited these experiments and demonstrations during last five years. Several farmers in the area have started following this innovation to increase their income, save ground water and to rejuvenate their nutrient depleted soil.

Suggestions

1. The state governments of Punjab and Haryana may consider giving incentives to the farmers to promote this innovation as a package to save water, and to improve soil health.
2. The research organizations in the region should concentrate to develop only short duration varieties of paddy like PR126, PB1509, PB1692, PB1847 etc. (Seed to seed 110 to 120 days).
3. Full proof Mechanism of MSP, Procurement,

Marketing, Value addition and Trade must be ensured for these varieties.

6.4 Testing of Promising New Rice and Wheat Varieties for Location Specific Suitability

A long term field experiment is in progress to assess the performance of different rice and wheat varieties popularly grown by the farmers in terms of growth, productivity, resource use efficiency, response to weeds, insects, diseases, weather parameters (such as rainfall, temperature, relative humidity, heat and cold waves etc.) and economics. The wheat varieties are planted on ridges and paddy straw spread in the furrows to check weed growth, build soil organic matter and to conserve water. Bumper yield of wheat is obtained since 2018-2019. Each year growth and yield data is correlated with weather aberration like heat wave and pest infestation and shared with stake holders.





6.5 Crop Diversification Options for Rice-Wheat Cropping Sequence

Diversification from rice-wheat systems to maize, soybean, millets, oilseeds, vegetables, fruits, flowers and other high value medicinal and aromatic plants is need of the hour to conserve water, soil, biodiversity and environment for survival of mankind in the future. The diversification options being explored are depicted in the pictures below. Demonstrations at GSF research farm on evaluation of promising soybean, maize during *kharif* and mustard and gram during *rabi* are established each year.

Experiments are in progress since 2018 to explore possibility of growing alternate crops to replace some area

from rice to other less water requiring alternate crops. The treatments included: (i) rice as sole crop, (ii) soybean as sole on raised bunds, (iii) green gram sole on raised bunds, (iv) maize as sole on raised bunds, (v) soybean on bunds + rice in furrow, (vi) green gram on bund + rice in furrow, (vii) maize on bund + soybean in furrow, and (viii) cluster bean on bund and maize in furrow. The crop options during *rabi* included: mustard, gram, winter maize, berseem, lentil and vegetables as sole or in combination with wheat following furrow-ridge planting geometry. Performance of crops in different treatments is being evaluated in terms of overall productivity, resource (water, nutrient) use efficiency, change in physical, chemical and biological properties of the soil overtime domain; nutritional





security, green house gases sequestration and economics. Further trials are being planned to evaluate different soybean and maize varieties to obtain high targeted yield level.

6.6 Fruit Based Agroforestry System on Field Boundary for Carbon Sequestration and Doubling Farmers Income

Farmers, in general do not grow trees along with crops on their farms due to negative shade impact on associated crops and also because of difficulty in executing field operations. A new concept of planting fruit trees on the boundary of the farm along with vegetables, aromatic and medicinal crops in between is being tried and evaluated at the research station since 2018. The fruits and inter crops planting has been designed in such a way that all 365 days of the year, these commodities are available at

the door step of farmers. The small and marginal farmer has regular supply of fruits and vegetables for home consumption and also surplus for the market to generate income needed for daily use. About two dozen fruit yielding plants are planted along boundary of the farm. About 70% requirements of nutrients for these fruits and vegetables is met through the decomposed organic manure generated in the integrated farming system model. Most of the fruit trees like Guava, Mango, Amla Pomegranate, Ber, Banana and Lemon have started producing economical yield. The concept is being promoted that whatever carbon is generated from the field is sequestered by these trees at the farm itself. The results are very encouraging and practical way for doubling income of small and marginal farmers and contribute to nutritional security at the grass roots level.





6.7 Rice Crop Straw Management Model: Killing Five Birds with One Stone

Sowing of wheat on raised bunds and placing harvested rice residue in furrows as mulch, saves water by 20 – 30%, controls Mandusi (Phalaris minor) and other weeds, conserves excess rain water in-situ, ensures minimum adverse impact on wheat due to

submergence and lodging and better microclimate for soil microbes to flourish. Wheat planted on ridges gives almost same and even more yield than sown on flat surface and escapes lodging. The GSFRED demonstrated this eco-friendly approach for last 3 years at their research centre to create awareness and capacity building of farmers.



6.8 Production of Quality Seeds

Seed is an important input for improving productivity of agricultural crops. Seed of promising rice, wheat, soybean, short duration green gram, mustard, gram, vegetables and flowers varieties is being produced for distribution to the farmers at

Kissan Mela/Kissan Day. The farmers are encouraged to buy only small quantity of seed for location specific testing at their own fields. They are also advised to test and plant atleast 3-4 varieties at their farm as an option to cope with unpredicted climate change impact.



6.9 Production of Quality Saplings of Flowers, Fruits, Aromatic and Medicinal Plants

High quality nursery of fruit plants, flowers, landscaping species, aromatic and medicinal plants is established to supply quality planting material to the farmers and other stake holders. About two

dozen fruit plants are planted and maintained to serve as mother plants for supply of scion wood for asexual propagation of Mango, Guava, Fig, Lemon Pomegranate, Plum Musambi etc. Farmers and stake holders visit the centre almost daily for purchase of quality planting material.



6.10 Awareness Creation About Safe Food Production/Organic and Natural Farming Practices

Fruits, vegetables and other food crops are grown without or with little use of agro chemicals. Mainly decomposed crop residues and cow dung is used to meet the nutrient requirement of these crops. The farm produce is leveled as FARM FRESH NATURALLY PRODUCED ALMOST ORGANIC FOOD. All the items produced this way are showcased on the road side

from where travelers buy various items such as vegetables, fruits, jaggery, rice, pulses etc. While purchasing and using these almost organically produced food items they get sensitized about consumption of toxin free food items. Civil society members specifically visit the farm along with families to purchase farm fresh natural food with the concept "Cut and Carry". All the farm fresh natural food items are displayed at the GSFRED outlet from where they are free to pick up the items of their choice.





6.11 Agro-Eco Tourism Site

The GSFRED experimental and demonstration farm has taken the shape of an AGRO-ECO-Tourism Site.

Students from various schools and colleges, scientists, farmers, stake holders and civil society representatives have started visiting the farm about daily.





7.0 CELEBRATIONS

7.1 International Soils Day

International Soils Day was celebrated with students of Montfort World School, Karnal. The chairman of the foundation, Dr. Gurbachan Singh delivered a lecture on importance of soil and need for its conservation for achieving food, nutrition, livelihood and environmental security in the future. The visiting students were exposed to a

soil profile so that they learn about nature and properties of the soil. A visit to various experiments and demonstrations such as integrated farming system and agricultural diversification for doubling farmer income, conservation agriculture and in-situ paddy straw management for improving soil quality were shown.



7.2 Inauguration Ceremony

An Inauguration function of GSFRED Research and Education Centre was held on 27th Jan, 2019. To seek blessings of the Almighty, Sri Akhand Path was

organized from 25th to 27th Jan. More than 400 people attended the ceremony. The guests visited various research experiments and demonstrations laid out at the centre.



7.3 First Foundation Day

The first foundation day of GSFRED was celebrated on 3rd March, 2019 at its Research and Education Centre

near Karnal. Dr. R. S. Paroda, Ex-Secretary DARE and Director General, ICAR delivered the Foundation Day address and complimented the Founder Chairman for

establishing state of the art research and education center for communicating agricultural innovations for welfare of small and marginal farmers. Dr. Gurdev Khush, internationally recognized World Food Laureate and Fellow Royal Society, London presided over the function and delivered the presidential address. **Dr. Khush having very vast international experience commented that it is an initiative of its own kind for serving farmers especially small holders.** Dr. J S Samra, Former Chief Executive officer, National Rainfed Area authority of India; Dr. Ramesh Kanwar, Vice Chancellor, Lovely University and Ex- Head, Agricultural System Engineering, IOWA State University, USA; Dr. M L Madan, Ex-Deputy Director General, ICAR and Ex- Vice Chancellor, Mathura (U.P) and Akola (Maharashtra) also spoke and appreciated the very unique and innovative agenda of this Foundation. The Founder chairman Dr. Gurbachan Singh, Ex-Chairman, ASRB and Agricultural Commissioner, Govt. of India welcomed all participants and share the mission and objectives for exchanging knowledge and skill development. The delegates visited experiments already set up for integrated farming systems, crop diversification, climate resilient innovative

practices, holistic management of the paddy straw, agroforestry and evaluation of promising crops and their varieties. Burning of crop bio-mass pollute the environment and creating health hazards. Looking to the menace, the Foundation has initiated experiments for in-situ management of straw as mulch, manure production and soil health improvement options. There was very elaborate interaction between scientists, farmers and representatives of public and private organizations providing input and services. More than 400 participants attended the Foundation Day including Directors of institutes of several private as well as public sector institutes and universities. The notable research and extension managers included: Dr. P. C. Sharma, Director, CSSRI, Karnal; Dr. Gopal Lal, Director, National Research Centre of Seed Spices, Ajmer; Dr. M. S. Chauhan, Director, Central Institute for Research on Goats, Mathura; Dr. Rajbir Singh, Director, ATARI, Ludhiana and Dr. Samar Singh, Regional Director, HAU RRS, Karnal. On this occasion Dr. Paroda and Dr. Khush also inaugurated soil and water testing laboratory for testing of soil and water samples of farmers. The second newsletter of the foundation was also released.



7.4 Earth Day Celebration

On the eve of Earth Day, about 400 students of Adarsh School, Karnal visited the Centre. The students took keen interest in visiting various experiments and

demonstrations initiated at the centre along with their teachers. The chairman interacted with staff and students and apprised them about the importance of soil and necessity of its conservation for survival of the



mankind. Students were exposed to different kinds of fruits, vegetables and other crops grown at the farm. Staff and students along with GSF staff planted tree saplings and also took pledge to save mother Earth. Later on, they kept bowls filled of water and grains for the welfare and well being of birds and small animals.

7.5 Kissan Day

A Kissan Divas was organized on 30 October, 2019 to

show various agricultural technological innovations being demonstrated at the research farm to farmers, unemployed youth and students. More than 700 farmers, students and stakeholders participated. The Kissan Day was inaugurated by Dr. S. K. Malhotra, Agriculture Commissioner, Govt. of India and Dr. P. C. Sharma, Director, CSSRI, Karnal and Dr. Rajbir Singh, Director, ATARI, Ludhiana were guests of honour.



7.6 Second Foundation Day

The second foundation day was celebrated on March 3, 2019. Dr. R. B. Singh, Former President, National Academy of Agricultural Sciences delivered the Foundation Day Lecture. The celebration was attended by about 800 people including scientists, farmers,

students and civil society representatives. The notable people who participated included Dr. M. L. Madan, Former DDG (Animal Sciences), ICAR; Dr. Samar Singh, Vice Chancellor, Maharana Pratap University of Horticulture and Technology; Dr. P. C. Sharma, Director, CSSRI, Karnal and Dr. G. P. Singh, Director, IIWBR, Karnal.



7.7 Fourth Foundation Day

The Fourth Foundation Day was celebrated at its Research and Education Centre, Karnal on 13th March,

2022. Padma Shri awardee, Dr. M. L. Madan, Former Deputy Director General, ICAR and Former Vice Chancellor delivered the Foundation Day Lecture. Dr.



Gurbachan Singh, Chairman GSFRED chaired the session. Dr. Madan highly appreciated the efforts of Dr. Gurbachan Singh for establishing the centre after his retirement to link farmers with agriculture technologies/ innovations and also to retain youth in agriculture. Dr. Madan also lauded GSFRED efforts for demonstrating the way forward for doubling farmer's income through integrated farming system model. Honourable Sant Kashmir Singh Ji, Gurudwara Nanaksar, Sector 6, Karnal and Baba Jaswinder Singh Ji, Nirmal Kutia, Zarifa also graced the celebration. Dr. Samar Singh, Vice Chancellor, Maharana Pratap University of Horticulture and Technology, Karnal; Dr. P. C. Sharma, Director, CSSRI, Karnal; Dr. G. P. Singh, Director, Indian Institute of Wheat and Barley Research (IIWBR), Karnal; Dr. Rajbir Singh, Director, ATARI, PAU, Ludhiana and Dr. Aditya Dabas, Deputy Director Agriculture, Karnal graced the occasion as guests of honour and addressed the gathering. About 400 participants attended the function which included scientists, farmers,

representatives of public and private organizations and civil society. Shri Vijay Setia, former Chairman Rice Exports Association; Shri Ravi Beri, Beri Udyog; Dr. Radhey Shyam Sharma, Former Vice Chancellor; Shri Bambha, President, Haryana Beopar Mandal, Dr. B. S. Parkash, Dr. Satyabir Singh, Dr. G. D. Sharma, Dr. Ravish Chatrath and Dr. S. K. Kamra also graced the occasion. Fourth newsletter of the Foundation was released on this occasion.

The participants were exposed to various experiments and demonstrations established at the research centre. In his concluding remarks Dr. Gurbachan Singh thanked all participants and emphasized the need of forming a stake holders group to promote sustainable eco –friendly agriculture to conserve water, soil, biodiversity and air quality. He also shared that GS Foundation Research and Education Centre will be open as Agro-Eco-tourism site for students and civil society members soon. Dr. Harinder Singh presented the vote of thanks.

8.0 INTERNATIONAL AND NATIONAL VISITORS

During last about five years, large number of research managers, administrators, policy experts, civil society representatives, scientists from abroad and India paid a

visit to the centre. Notable visitors are presented in the form of photo gallery.



Dr. Gurdev Khush, Fellow, Royal Society, London And World Food Laureate, Devis, USA visited Twice



Dr. R.S. Paroda, Former Director General, ICAR and Secretarty, DARE, GOI



Dr. S.S. Sandhu, Virginia, USA



Dr. Nirmal Tej Singh, FNA, Former Director, CSSRI, Sacramento, USA visited Thrice



Dr. Ramesh Kanwar, Vice Chancellor, Lovely University and Former Professor, IOWA, State University, USA visited twice



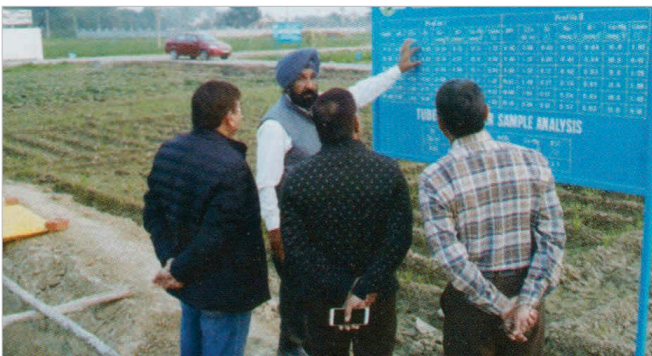
Dr. Trilochan Mohapatra, DG, ICAR and Secretary, DARE; Dr. S. K. Choudhary, DDG (NRM) visited twice



Dr. P.C. Sharma, Director, CSSRI, Karnal (several times)



Sant Kashmir Singh Ji, Gurudwara, Nankasar, Karnal (Four Times)



Scientists from CSSRI, Karnal



Delegation of precision agriculture for development accompanied by Dr. Samar Singh, Vice Chancellor, Maharana Pratap University of Horticulture and Technology



Retired Scientists, Dr. Jaipal Dhindsa And Dr. Ashok dhawan



Dr. K. C. Bansal, Former Director, NBPGR, Delhi and Secretary, NAAS



Dr. Om Prakash Yadav, Director, Central Arid Zone Research Institute (CAZRI), Jodhpur



Dr. Inderjeet Singh, Vice Chancellor, GADVASU, Ludhiana (Twice)



Dr. B.S. Ghuman, Advisor, CRRID, Chandigarh



Mauritius Delegation



Dr. Gyanendra Pratap Singh, Director and Scientists, IIWBR, Karnal



Dr. Aditya Dabas, DDA (Agri.), Karnal with CRM team (USA)



Scientists from Japan



Dr. Inderjit, VC, GADVASU, Ludhiana



Dr. Aditya Dabas with IG Police



Scientists from UK and Australia



Retired Scientists from PAU, Ludhiana



Shri Subash Chander, Vice Chairman, Swatch Bharat Mission



Dr. Bhagirath Chauhan, Professor, University of Queensland, Australia



Scientists From USA



Mr. Sinha, IAS, ADC, Panchkula



DGM, NABARD with Officers



Retired Beaucrats at GSFRED



Dr. Harkesh Sandhu M.D. and President, Sahaita Organization from California, USA



Dr. Kuldeep Singh, Director, National Bureau of Plant Genetic Resources (NBPGR) New Delhi



Trainees from eight states of India



Trainees from nine countries

9.0 VISITS OF FARMERS AND STAKEHOLDERS

Large number of farmers and stake holders from the states of Haryana, Punjab, Delhi, UP, Uttarakhand, HP and Rajasthan visited the centre. A group of prominent stakeholders of the area including Sh. Ravi Beri, Beri Udyog, Karnal; Sh. Bhubnit Singh, Kaliaana Farm, Kulvehri; Vinu Bhatia, progressive farmer, and a young entrepreneur from Australia visited the Centre on 31st March, 2019. The Chairman of the foundation had a long discussion with the visiting farmers and an industrialist to establish a Stakeholders Forum involving progressive farmers and farmer representatives, scientists, state government officials, private sector NGO's, industry representatives dealing

with agricultural inputs including implements and machinery, agricultural market and trade representatives etc. The agricultural Stakeholders Forum will comprise about 60 representatives, and as a first exercise about 20 names were finalized. This Forum will have a monthly meeting on topical issues related to problems of farmers and also initiate skill and entrepreneurship development amongst unemployed youth, farmers and students. The Forum was established but meetings could not be organized due to onset of COVID-19 pandemic. Now onwards, this will be a priority item on GSFRED agenda for the future.





10. VISITS OF SCHOOL STUDENTS

One of the main objectives of GSFRED is to link school students with theory and practice of agriculture to create awareness about conservation of natural

resources of soil, water, biodiversity and climate. In the pre COVID period, about 3000 students from different schools visited the centre.

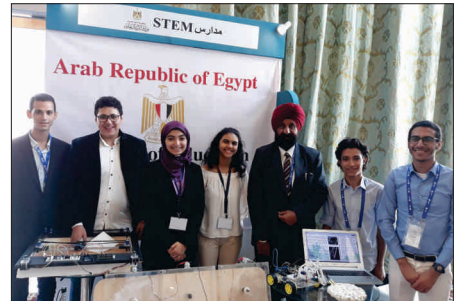




11. CHAIRMAN'S VISITS TO NATIONAL AND INTERNATIONAL RESEARCH CENTRES/ORGANIZATIONS



Canada and USA



South Illinois University, USA

Participation in Cairo Water Week, Egypt



Bali, Indonesia



QRT Chairman of NIASM Baramati



ICAR Institute at Goa



Chairman ASRB with Scientists of NIASM Baramati



Karnal District Agricultural Council (KDAC)



Innovative Farmer's Meet



Thiruvananthapuram (UGC nominee on Governing council of Mar Ivanios College)



Indian Institute of Sugarcane Research, Lucknow



Chairman, Research Advisory Committee, CRIDA, Hyderabad





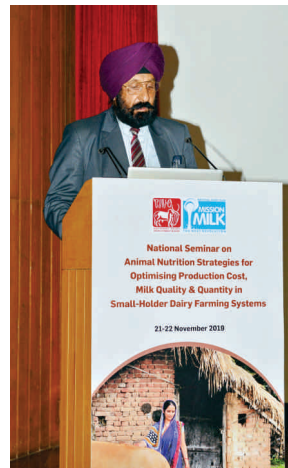
CRRID, Chandigarh



CII Northern India Head Quarters in Chandigarh



National Dairy Development Board (NDDDB), Anand



SBI Kissan Mela, CSSRI, Karnal



CIMMYT, BISA Group



TASS Board Meeting in New Delhi



CRIDA, Hyderabad



NASC, New Delhi



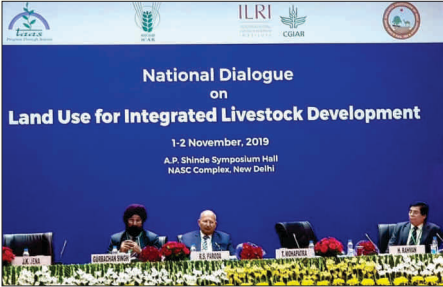
M.S. Swaminathan Award Function of TASS



KAB-II, New Delhi



TASS, New Delhi



TASS, New Delhi



International Potato Symposium, Jaipur



12. Ph.D STUDENTS AND INTERNSHIP TRAINEES

Twelve students from various colleges and universities completed their internship training at GSFRED. One student completed his Ph.D on conservation agriculture under IARI-CIMMYT-GSFRED collaboration.

The student, Dr. Radhey Shyam conducted his research trials at GSF research farm. Another student under CCSHAU-CSSRI-GSFRED collaboration is pursuing her Ph.D research on management of sub-surface sodicity.



Trainee Student



Trainee Student

13. STONE LAYING CEREMONY OF GSFRED, MAIN BUILDING

The Foundation stone of main building of GSFRED was laid by Sant Kashmir Singh Ji of Nanaksar Gurdwara, Sector-6, Karnal and Baba Jaswinder Singh of Nirmal

Kutia, Zarifa Farm in September, 2021. The new building is now ready for inauguration.



14. MOU SIGNED

14.1 Alpha Planters

GSFRED signed an MOU with Alpha Advantech LLP, Karnal (Alpha Planters) for research collaboration on the project “Testing efficiency of Alpha Planters pots and trenches developed by Alpha Advantech LLP in terms of growth and productivity, water use efficiency and credit worthiness of the new innovation”. The MOU was signed by Dr. Gurbachan Singh, Founder Chairman, GSFRED and Mr. Nitin Lalit, CoFounder, Alpha Advantech LLP, Karnal.



14.2 Central Soil Salinity Research Institute (CSSRI), Karnal

GSFRED signed an MOU with CSSRI, Karnal on 30 October, 2019 in the area of soil salinity and water quality research, education and development.



An MOU was signed between GSFRED and Central Soil Salinity Research Institute, Karnal

14.3 Indian Institute of Wheat And Barley Research (IIWBR), Karnal

Signed an MoU with IIWBR in the area of wheat and barley research, extension and development. The MoU was signed by Chairman, GSFRED and Director, IIWBR.

15. GSFRED PUBLICATIONS

- Singh, Gurbachan and K. Lal. 2018. Review and Case Studies on Biodrainage: An Alternative Drainage System to Manage Waterlogging and Salinity. Irrigation and Drainage, 2018, 25 pages
- Samra J. S. and Gurbachan Singh. 2019 (Editors). Crop Residue Burning: Management Strategies for Safe Environment. GSFRED, Karnal, 262 pages
- Singh, Gurbachan. 2018. Biosaline Agriculture : An Alternate to Drainage for Management of Salt

Affected Soils, Proceedings International Conference on Cairo Water Week held in Cairo (Egypt) from 13-17 October, 2018.

- Singh, Gurbachan. 2022. Role of Prosopis in reclamation of salt affected soils and soil fertility improvement. In Prosopis as a Heat Tolerant Nitrogen Fixing Desert Food Legume (Editors: Maria Cecilia Puppo and Peter Felker). Elsevier Publications

FOUNDER CHAIRMAN

A Biography



The Founder Chairman, Dr. Gurbachan Singh was born on 16th September, 1954 in village Bhaini Maraj, district Sangrur, Punjab. His parents were illiterate and engaged in farming. The village was educationally, economically and politically disadvantaged and backward. During his early school days, Dr. Singh used to graze cattle with his grandfather and assist the father in day to day farming activities. However, his father had love for education and encouraged him to get the best available education wherever possible. After completing primary and higher secondary education from village schools Bhaini Maraj, Badbar and Mastuana Sahib, he did B.Sc (Agriculture) in 1975, M.Sc. (Agronomy) in 1978 and Ph.D (Agronomy) in 1988 from Punjab Agricultural University, Ludhiana with distinctions and obtained an overall grade point average of 4.0/4.0 during Ph.D. Dr. Singh was University Merit Scholarship holder during B.Sc. (Agri.) and M.Sc. (Agronomy). He successfully competed the Agricultural Research Service (ARS) examination in 1978 and joined as scientist at the Central Soil Salinity Research Institute (CSSRI), Karnal and served this Institute for nearly 20 years as scientist S-1, scientist S-2 and senior scientist. He had the privileged

of working with illustrious scientists and research managers like Dr. J.S.P. Yadav, Dr. I.P. Abrol, Dr. N.T. Singh and Dr. D. R. Bhumbra. In 1998, he joined as Principal Scientist (Forestry/Agroforestry) at the National Research Centre for Agroforestry (NRCAF), Jhansi and served there for about 18 months and thereafter he was selected as Head, Crop Production Division, Indian Grassland and Fodder Research Institute (IGFRI), Jhansi. In November, 2001, Dr. Singh was selected as ADG (Agronomy) and worked at ICAR, Headquarter, New Delhi up to May 12, 2005. As ADG, he was facilitating dryland, cropping systems, climate change, agrometeorology, weed management, desertification control and organic farming research in the country. During 2005, he was selected for the post of Deputy Director General (Research), Indian Council of Forestry Research and Education (ICFRE), Dehradun and also as Technical Expert (in the rank and pay of Additional Secretary to Govt. of India) in the newly established National Rainfed Area Authority (NRAA) Govt. of India. However, he did not join these higher positions but preferred to join as Director of the CSSRI, Karnal where he started his research career in 1978.



Dr. Singh got married in 1979 and the family besides his wife has two sons, daughter in laws and three grand daughters and two grandsons. His wife Mrs. Harjit Kaur is M.A. (English), M.Ed. and is in the field of education since 1980. After serving as Principal in several good schools at Karnal, she established her own school "Adarsh Public School" in 1987. It is worthwhile to mention that she started the school in 1987 in one room rented building with 60 students. The first furniture for the students was made after selling the only motor cycle the family had that time and the dining table received as wedding gift served as official table of the Principal for about 8 years. The same lucky

gift being still used in the outlet at GSFRED His both sons did masters in Business Management. The elder son Tanvir worked with MNC's for about 6 years. The younger one, Mansimar preferred to be in education profession to follow the foot prints of his mother. In 2012, Tanvir also left his very lucrative job with Bajaj Company and joined his mother's profession. He established state of the art international school "Montfort World School" in 2013 which is upcoming as one of the best schools in North India. The trio are now running two 10+2 prestigious schools, one affiliated with ICSE and the other one with CBSE, New Delhi with about 5000 students in Karnal, Haryana.



Dr. Singh's research on reclamation and management of salt-affected soils is recognized at the national and international levels and is acknowledged even in the most prestigious journal SCIENCE. His scientific contributions has focused on developing alternate approaches to sustainable use of soil resources whose productive capacity has been diminished due to accumulation of excess salts in the root zone. These approaches have involved identifying salinity and alkali tolerance of the large variety of species of potential fuel and forage value, developing agro-techniques for their successful establishment and growth and evaluating the economic and ecological significance of forage and fuel based production systems. A pit-augerhole technique which enables root penetration through the high density caliche layer in sodic soils was developed. Long terms studies to evaluate the impact of growing salt tolerant fuelwood-forage species showed significant improvements in soil through displacement of salts and products of exchange brought about by mobilization of native low solubility calcite. These biologically mediated processes offer a significant opportunity to restore productivity of degraded soil resources. Other notable scientific contributions include: introduction and evaluation of thirty species of Prosopis and several clones of Opuntia (*Ficus indica*) for improvements in respect of bole and thornless characters and establishment of seed/propagule orchards as germplasm source for salt stress. These research innovations attracted international funding agencies like the World Bank and the European Union and sizeable area affected by sodicity in possession with small and marginal farmers and village Panchayats was reclaimed and rehabilitated.

In 1991, Dr. Singh visited Texas A&I University, USA and worked in Peter Felker's laboratory for four

months on Prosopis and cactus research. He was invited to deliver seminars at Texas A&I, Kingsville and Texas A & M college station.

In 1996, Dr Singh was invited to present his keynote paper and to chair the technical session in the International Workshop on Prosopis held in Washington, DC, USA. In 2004, he was invited to present his key note paper in the Fifth International Congress on Cactus Pear and Cochineal held in Mexico from August 2-7, 2004. Similarly, in 2007 he was invited to present a key note paper and also to chair the technical session in the 6th International Congress on Cactus held in Brazil

As ADG at ICAR (2001 to 2005) Dr. Gurbachan Singh conceptualized formulation and implementation of two mega research programs, one on climate change and the other one on organic farming during 10th Plan. These initiatives culminated into flagship programs of ICAR during successive Plans. During his tenure as Director, CSSRI got the Best Institute Award of ICAR and also the Ground Water Augmentation Award of Ministry of Water Resources. He led the institute from front and established linkages with several international organizations engaged in research and development. To name a few select ones include: European Union Funded six countries consortium programme on biosaline agroforestry; IRRI and CIMMYT facilitated platform for research on conservation agriculture; Action Aid International funded project on rehabilitation of Tsunami affected areas in Maldives, Sri Lanka and India; US-India Knowledge Initiative (AKI) programme and projects funded by ACIAR, IAEA and IRRI. He invited several doyens of agriculture like Dr. V. L. Chopra, Dr. S. S. Johl, Dr. G. S. Kalkat to show case institute work.

As Union Agriculture Commissioner (2010 – 2011) he facilitated formulation and implementation of focused





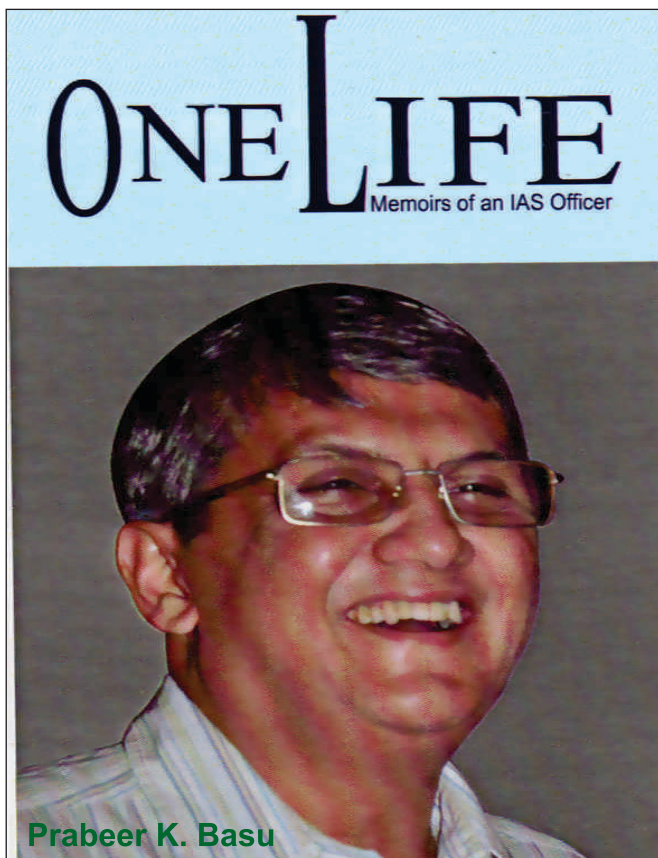
programs which resulted in ever highest production of food grains continuously for two years, which also included additional production of 3.5 million tons of pulses in one year. This much increase in pulses production in one year happened for the first time after independence and the country became almost self sufficient in pulses. The Secretary Agriculture, Govt. of India Shri P. K. Basu lauded Dr. Singh's contribution in his book 'One Life'. The cited text is reproduced below.

"The other person I was impressed with was Dr. Gurbachan Singh, who was the Agriculture Commissioner when I became Secretary of the Department. He was a good scientist and at the same time had complete practical

knowledge of agriculture. And he was a work horse. None of what the Ministry achieved would have been ever possible if he was not there. He drove the scientists and the State government officials to higher and higher levels of achievement. That was possible because he himself touched every nook and corner of the country, drove for thousands of miles visiting farmers and farm fields, walked mile after mile. His subordinates and colleagues had no choice. Everybody respected him for that. After his tenure, Mr. Pawar chose him for the post Chairman, Agriculture Scientists Recruitment Board (ASRB), which was Secretary level post"

The other new schemes formulated and implemented by Dr. Gurbachan Singh under the guidance of honourable visionary Agriculture Minister Sh. Shard Pawar Ji and secretary Sh. P.K. Basu Ji included. Bringing second green revolution in East India, scheme on Fodder and also a scheme on promotion of millets (Nutri cereals).

Notable reforms taken by Dr. Gurbachan as Chairman, ASRB (2011 – 2017) included: establishment of online examination facility at 23 centers; regular conduct of ARS and NET examinations; regularization of promotion of scientists under CAS; revamping of score card for screening and selections; revision of syllabus and question bank in 56 disciplines; upgradation of experts/advisors list; attracting talent from abroad; enhancement in efficiency, transparency and productivity of ASRB and initiating approvals for construction of independent ASRB building on 2 acres of land adjacent to NBPGR, New Delhi. During his tenure, about 2000 scientists were recruited through examinations and direct advertisements, promoted 1503 scientists and issued 17870 NET certificates. The scientists, research managers and administrators selected and mentored by Dr. Gurbachan Singh are occupying top positions in Ministries of Agriculture, Fertilizers, Water Resources, Forests and Climate Change etc.



Prabeer K. Basu

Dr. Singh is recipient of several National and International Level Awards and peer recognitions for his outstanding contributions in agricultural research, education, development, and policy, including Hari OM Ashram Trust Award of ICAR, 1989; Dr. K.A. Shankarnarayan Award by Central Arid Zone Research Institute (CAZRI), Jodhpur in 1993- 94; Tenth Sukumar Basu Memorial Award by IARI in 1995-96; Rafi Ahmed Kidwai Award by ICAR (1996-98); Recognition Award of National Academy of Agricultural Sciences, 2005-06; Life Time Achievement Award by High Tech Horticultural Society of India, 2013; Haryana Ratna Award by NIFAA in 2013; Dr. D. Sundaresan Oration Award by NDRI, Karnal, 2013; Award of Honour by Chief Minister of Punjab in 2014; Bioved Sangam Ratna Award, 2014; Harit Ratna Award by All India Agricultural Students' Association in

2014; Dr. M. S. Randhawa Memorial Award by NAAS at 12th Agricultural Science Congress, 2015; Amit Prabudh Manishi Award 2015 by ASM Foundation, New Delhi; Dr. K. K. Iya Memorial Oration Award by NDRI, Karnal, 2016, Agricultural Leadership Award by ICFA, New Delhi and D.Sc (h. c.) degree from Hon'ble Governor of Orissa and Life Time Achievement Award in 2017 by Indian Society of Range Management, IGFRI, Jhansi.

He served as Founder President of the Indian Society of Soil Salinity and Water Quality and elected (2013-15) and consensus (2015-17) President of Indian Society of Agronomy with a life membership of more than 3000 scientists; Vice President, Prosopis Society of India and Indian Society of Farming System Research and Development. He is a distinguished Fellow of National Academy of Agricultural Sciences, Honorary Fellow of



Indian Academy of Horticultural Sciences, Honorary Fellow of Arid Zone Association of India; Honorary Fellow of Indian Society Agroforestry; Fellow of Indian Society of Agronomy, Indian Society of Soil Salinity and Water Quality, and Indian Society of Soil and Water Conservationists, Range Management Society of India. Dr. Singh has served as Chairman/Member of several national and international level research, education, development and policy committees including: Chairman, Registration Committee for Insecticides, Pesticides and Weedicides; Chairman, Technical Committee of Central Seed Certification Board; Chairman, Central Fertilizer Committee; Chairperson (Acting), Protection of Plant Varieties and Farmers Rights Authority of India; Vice Chairman, TAAS; Chairman, Crop Weather Watch Group; Director, Board of Directors, National Seed Corporation; Member, Board of Management, IARI, New Delhi; Management Committee of National Institute of Agricultural Extension Management; Management Committee of NOVOD Board and Institute Management and Research Advisory Committees of 5 ICAR institutes. He also had the distinction of delivering Convocation Addresses as chief guest in more than a dozen universities. Dr. Singh also organized and inaugurated several national and international conferences/seminars/workshops, including International Agronomy Congress. He was President of International Agronomy Conference attended by 1000 scientists including 100 scientists from abroad.

He visited more than 40 countries to Chair sessions, present keynote papers and as head/member of Indian delegations. Notable ones included: FAO Cactus Net Regional Coordinator for West Asia; Scientific Advisor, International Foundation for Science, Sweden; Member, Working Group on Sustainable Drainage of International Commission on Irrigation and Drainage (ICID); Country leader to twenty-second Session of the Committee on Agriculture FAO, Rome, Italy, 2010; Head, Indian Delegation to 30th FAO Regional Conference for Asia and Pacific, Gyeongju, Republic of Korea, 2010; Head, Indian Delegation to IRRI, Manila, Philippines, 2010 and Head, Indian Delegation to CIMMYT, Mexico, 2011. He is honorary member of Editorial Board of "Experimental Agriculture" published from UK and several Indian Journals. He has more than 280 publications to his credit including research papers, popular articles, books, book chapters, review papers, bulletins and consultancy reports. This list also includes more than 40 research papers in high impact international journals.

Dr. Gurbachan Singh retired from service on 26th May, 2017. He has planned to continue working to promote research, academics, farmers welfare and social activities. His family has established Dr. Gurbachan Singh Foundation for Research, Education and Development (GSFRED) to realize his vision and mission.

Recently, Govt. of Haryana has nominated Dr. Gurbachan Singh as chairman of a Task Force to prepare Farmers Welfare Policy with vision 2047.





GURBACHAN SINGH FOUNDATION FOR RESEARCH EDUCATION AND DEVELOPMENT

14 Milestone, Karnal-Kaul-Pehowa Road, State Highway-9, Karnal-132001, India

Email: info.gsfred.in@gmail.com | Website: www.gsfred.in

Printed at: **AARON MEDIA**, SCO-249, 1st Floor, Sector-12, Opp. Mini Secretariat,
Karnal-132 001 (HR.) INDIA | Email : aaronmedia1@gmail.com | M. - +91 99965 47747, 98964 33225

