

Honey Bee



Vol 3 No 1 January, 1992



An informal quarterly newsletter to document innovations produced by farmers, artisans and farm workers; generate debate around sustainable alternatives based on people's knowledge system among farmers, scientists, political leaders and social activists and lobby for protecting intellectual property rights of grassroots innovators.



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How to be a member of "Honey Bee" Network ?

You can be a member of "Honey Bee" network, by sending the contribution in favour of A/c. "Honey Bee", Indian Institute of Management, Ahmedabad. This includes cost of four issues and information about our other research papers. Contribution Rate:

	National (Rs.)	International (US \$)
Patron	2000 or above	200 or above
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Foreign aided NGO	200	30
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It is strange but true that most of the activists, policy makers, NGOs and professionals who talk and write about participative planning and grassroots oriented development seldom acknowledge the contribution of the people from whom they acquire various insights. Even if the reference is made, it is without name.

It is for these faceless and nameless peasants, pastoralists, artisans, fisherwomen and men etc., that this newsletter strives to provide a platform. The purpose is to document, experiment, debate, disseminate and derive new insights for sustainable development.

Sustainability of Honey Bee

I look at the concept of sustainability not just in terms of the renewability of resources and their availability to future generation in augmented forms. To me the renewability of institutions aimed at dealing with resources, ideas and pride of people in their own knowledge system is as important if not more. Non-sustainable institutions cannot promote sustainable development. Hence, my concern about the Honey Bee. Please write back with imaginative suggestions about the sustainability of this newsletter. Will some of you like to guest edit special issues or columns there in?

Our Family size!

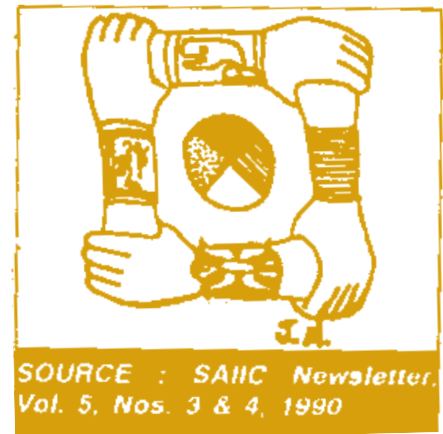
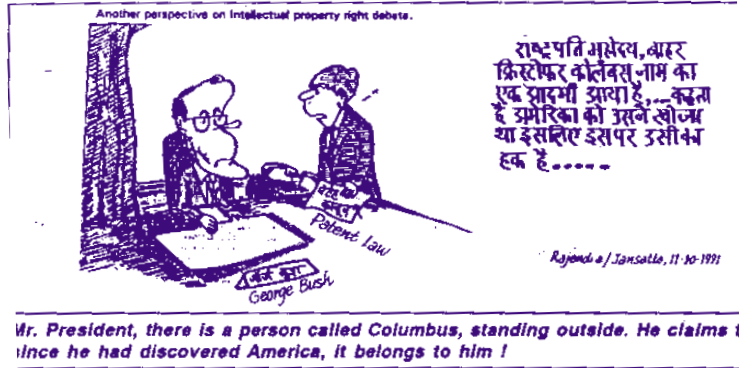
We do not advocate a 'small family size' when it comes to Honey Bee. Of course our readers in villages and cities will agree that smaller family otherwise is a bliss. But not when one includes readers in different countries in this family.

I am extremely happy to share with the readers the good news that we have now a network spread in 35 countries ranging from Peru, South Africa to Sri Lanka and Australia. Most of the readers have offered their comments on the earlier issues of the newsletter. Many have not. I hope that many of these silent colleagues will also write back even if critically.

Who reads, who cares!

Most gratifying experience last year was the response from about one fifth of the 300 farmers and pastoralists in Gujarat whom we sent a local language edition. One of them was (Vadher Jayaram Bhai of village Moti Chandur) offended that we underestimated the readership of the newsletter. They felt bad that the stapling of the newsletter was not sturdy enough to stand 15-20 hands through which the newsletter passed. Some others suggested we should have a column for proven technologies. The contributors would challenge the readers to find a better substitute for practices listed under this head. Please send us proven practices. The spirit of excellence and competition is getting reinforced.

The response from readers of Oriya and Hindi version is also encouraging. The Tamil version is being refurbished. 'Thenikkal' did not share the idea of collaborative learning entirely. Efforts are being made to adapt another Tamil version which can help build bridges between people of that great culture and the rest of the country and the world.



Volunteers for local language adaptations

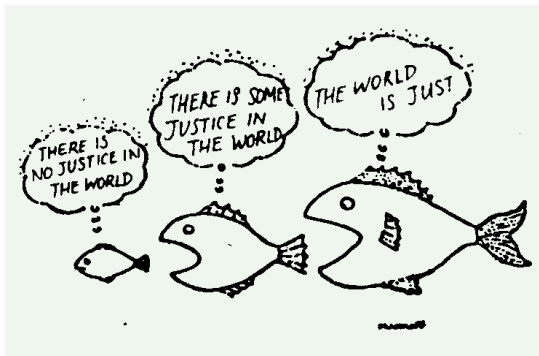
I must emphasize that while we do want to develop links with the scientists, administrators, voluntary workers, political leaders etc. We do not want to distract our attention from building people to people links amongst innovators at the grassroots. That is the reason we are looking for the volunteers from different parts of India and other parts of the world who can adapt Honey Bee in local dialect/language for its dissemination among local communities. The purpose is to recognise and emphasize two major ethical principles:

a) Knowledge collected from the people must go back to people in their language not only to fulfill ethical obligations of accountability but also for scientific reason. It is only then that they can validate or invalidate our meanings of their actions and intentions. When we feed back our findings interpretations and insights to the providers of knowledge, we get from them totally new insights which cannot be obtained by any other method. It is pity that most NGOs and other organizations who talk so much about people's participation never share their insights and learning in local language with the people with whom they work. What kind of accountability this is? If collective processing of information is illuminating for us, it will certainly be so for the farmers and farm workers, artisans and fisher men and women.

b) How many people understand English any way? English helps us to spread the network globally, while French and some other languages like Spanish will help us to reach the Francophone Africa and Latin America. But let us admit the dilemma of a modern intellectual: she is networked globally but alienated locally. We are trying hard to avoid meeting this fate. Do you share our concerns?

We also realise that given the low literacy, many poor and disadvantaged household may not be able to read even the local language version of Honey Bee. Our experience so far is with their names and addresses.

A Gospel of Dirty Hand!



Many readers have written to us appreciating that thoughts of Shri K M Munshi we quoted in the last issue. Please help in digging out more such references from your regions so that we can link ecological thoughts in past with the concerns of future. In a speech on "A matter of faith", he shows how the links between nutrient cycle, hydrological cycle and village communities would bring about the real "land transformation".

In every country, there are intellectuals and leaders who have had the unusual foresight about the shape of things to come. Unless we link our strategies of future change with these ideas, we will not be able to trigger institution building process in any society. Large number of foreign aid agencies try to take a short cut. They would try to implant

ideas without tracing the indigenous sources of critical thinking. The result is that such transplanted ideas are lost very soon. The case of farming systems research is a case in point. Most western (and many Indian) researchers will not like to acknowledge the contributions of K M Munshi or Dr. Y P Singh or Dr. C H Krishnamurthy who contributed original ideas in the field much before formal writings on the subject began in the west. Likewise, colleagues from Africa will not like to acknowledge the idea of Mobugunje and those from Latin America will ignore Rengifo of PRATEC, Peru.

I hope readers will suggest ways to overcome the inertia of colonised minds.

This issue brings you information about a lot of new innovative practice of the farmers. We are trying to bring out four issues this year. In 1993, we are aiming at six. But much will depend upon your reactions. So react.

Anil K Gupta, Editor and

Kirit K Patel, Associate Editor

and collaborators including Dr. A S Reddy, Dr. Kalyanasundaram, Dr. Sabachi Rath, P. Vivekanandan, Karma Ura, Dr. B T Patel, Dr S K Upadhyay, Narsa Reddy and many others.

Will you stand by the intellectual property rights of peasant?

Study of Traditional Agricultural Practices

Dr. P M Mane¹

Improvement of Micro Climate

Some farmers are following the practice of cultivating sorghum and/or pearl millet crops on the border of groundnut crop. Purpose seems to be to protect the groundnut crop from the salty air in the coastal area of Mangrol Taluka of Saurashtra region. Seeds of Pigeonpea are planted near the plantation of mango graft in Saurashtra region (Is it for the same purpose? Ed.)

Protecting the seedling from Wind Erosion by Opening furrows

During the field visit in Madargadh village in November, 1991, farmers told that they were facing the problem of wind erosion carrying mainly sand particles. It occurred sometime in the beginning of the monsoon season causing the damage to the foliage of seedlings of the crop sown at the onset of monsoon. To control this damage the farmers open a furrow between 3/4 lines of the crop in parallel way. In these open furrows sand being carried out by the wind is deposited. It reduces the damage to the foliage/leaves of the growing seedlings. It is a quite common practice mostly in the arid prone zones of Saurashtra and Rajasthan.

Variated Diversification

In some of the tribal villages of Bharuch district, few farmers are growing pigeonpea varieties with different duration on their fields (for instance short duration medium duration, midlet - long/late duration). The risk adjustment behaviour of this type is expressed to get the green pods of the pigeonpea either for home consumption as a green vegetable or for selling in the market continuously for about 3-4 months. The green pods of short duration will be available say in October, midlet variety in November-December and pods of very late variety in December - January, depending upon the respective sowing time. Interestingly such decisions of growing varieties of crops like pigeonpea are

being taken by the farm women jointly supported by the farmers. This practice might also help in escaping the insect damage e.g. pod borer of pigeonpea.

Preservation of Eggs

In summer season, some farm women keep eggs in earthen pot and again filled in with ash. Purpose reportedly was to maintain low temperature and avoid spoilage of eggs. This practice is generally prevalent where eggs are locally marketed in weekly or periodical markets by interior village inhabitants.

Escaping from Water Shortage by Using High Seed Rate

The farmers of Junagadh have developed an understanding that by using more seed rate of wheat (about 80/100 kg per acre) enhance the negative growth of crop and reducing the duration of the crop atleast by 8/10 days. This has been ascribed and acclimatized to the factor that water level in the wells goes down towards the maturity of the wheat crop particularly at the beginning of summer season and number of waterings due to the early maturity of wheat can be reduced.

Fodder Production

Lucerne (*Medicago sativa*) is a traditional winter fodder crop in Saurashtra. There is a tradition of mixing little quantity of barley and 'methi' (*Trigonella foenum-graecum*) seeds along with lucerne seeds and then whole mixture is broadcasted. There are couple of reasons for this: firstly, barley germinates and grow earlier than lucerne and sufficient green matter is obtained even in the first cutting when lucerne is thinly growing. Secondly, the belief of the farmers indicates that both the barley and 'methi' help animals to enhance the palatability and digestion process of the lucerne besides adding to the nutritive value of the fodder as such.

¹Programme Executive (Agriculture), Aga Khan Support Programme (India), Choice Premise, Swastik Char Rasta, Navrangpura, Ahmedabad 380 009

Is it Possible to Harvest Rainfed Paddy in Drought Prone Area?

Dr. S. Subramaniam¹

(Author extends his sincere thanks to Shri Veerabhadriah and other farmers of Pattanger village on whose information this article is based).

Chikkamagalore district is located in the western ghats of the Karnataka State. The western parts of the district is in the high rainfall zone and is a hilly terrain. The eastern portion are the plains of the deccan plains and are arid as it falls under the rain shadow of western ghats. The district suffers from both flood in the western parts and drought in the eastern parts. The difficult terrain has imposed certain conditions and the people have found their own innovative answers.

Paddy cultivation is normally done under either irrigated or as rainfed in high rainfall receiving areas. Kadur taluka of Chikkamagalore is a dry and drought prone taluka and the average rainfall is 740 mm. During 1990-91 the taluka underwent a drought and even drought resistant crops like 'Ragi', jowar and short duration crops like sunflower failed to grow successfully. But, in certain high lying arid lands near village Pattanagere or Kadur taluka, some of the farmers are growing rainfed paddy. The crop apparently was not so much affected by drought. Even when the 'Ragi' crop located adjacent to it was drying. Initial inquiries indicated that the variety of paddy is common in that area and is called 'Salu Batta' or 'Kempu Batta'. This is as resistant as 'Ragi' or Jowar to drought and so farmers prefer this paddy. The yield levels range from 12 quintals under best rainfall conditions and application of manure. The minimum yield would be at least four quintals of paddy irrespective of the rains and fertilizer application.

The seeds are drill sown just like any other dry crop. Seed beds are not preferred, but, presowing wetness of one day is normally preferred. The seeds apparently rot if these are put in a seed bed. Sowing is done strictly in the month of August and requires only four months to mature. It is believed that cold temperature of December is not conducive to this variety. Fertilizer is not normally applied. However, some of them do apply fertilizer after August rain in varying doses.

Experience of farmers have indicated that mostly the crop remains free of diseases, including Blast (Benki roga). The

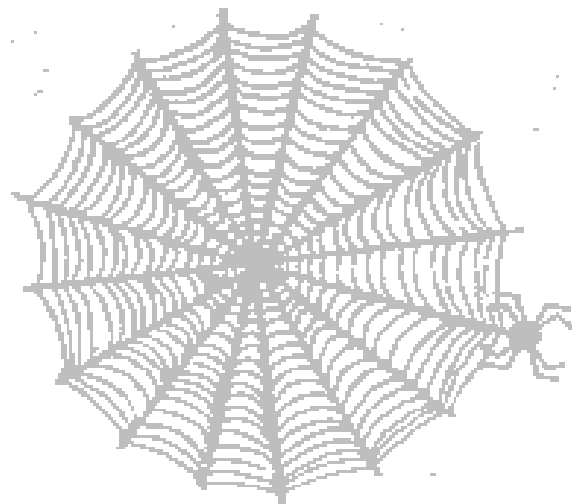
Thought for the day

"The dwarf (rice) varieties grow to a height of little more than half a metre. Kikkwa (1912) considers that they have little value, adding that they are often grown for the sake of curiosity". (Grist, 1953. Rice. London: Longman).

The Green Revolution in Asian rice was brought about through the transfer of a dwarfing gene into high yielding varieties: Thank God for farmers' curiosity !

Paul Richards
University of London U.K.

fodder quality is very good and is liked by the cattle. As the seed size is big and the length is less the seed would not break on drying. The mature seed adhere to the plant more firmly and hence there would not be much of loss at the time of harvesting. It is very clear that this is different from the drill sown paddy that we find in the rainfed zones of the Malnad of the state. The plant height is more than usual and the leaves are pink. It is proposed to send this germ plasm to agricultural university for further research. Plant material is freely available in many fields during the 'kharif' but the seed stocks are available only with the farmers and not in the market.



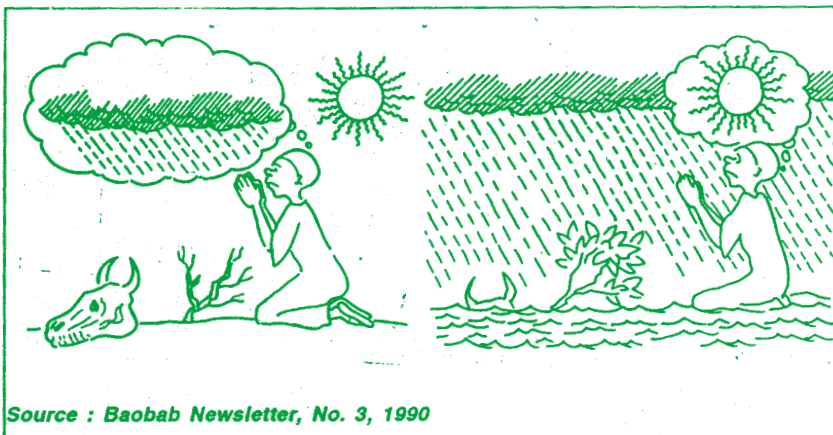
¹A S Collector, Chikkamagalore District, Karnataka State, India

Proverbs for predicting the mood of monsoon

Dr B A Golakia²

Since ages people have found very strange correlations among flora, fauna, weather, stars, cloud, wind, constellation, bird behaviour, moon and monsoon and those findings are still preserved in the form of proverbs, poems, beliefs rituals or stories. Since the climatic and ecological conditions have changed today, these observations need verification and testing.

The author has extracted these proverbs from 'Gangh', 'Bhadali' and 'Dunk' communities of Saurashtra.



Source : Baobab Newsletter, No. 3, 1990

1. Sparrow dust bathing, faint colouration of bronze articles and dark-blue sky are the signs of the possibility of heavy rains.
2. If the sky reddish then there will heavy rain, if the sky is faint yellow then there is less hope of rain.
3. If 'Kachanda' (Reptile) bears reddish colour on its lower portion of throat and the wind is blowing from North to West direction rain is expected immediately.
4. If rain comes in the month of 'Chaitra' then there would be dry spell during the month of 'Shrawana'.
5. If on the first day of the month of 'Ashadh' it rains then there will be dry - spell during the month of 'Ashadh', and 'Shrawan' and there will be rain during the month of 'Bhadarwa'.
6. High wind activity in 'Ardra' constellation indicates drought.
7. If there is lightening in North direction and wind is blowing from East then it will rain immediately.
8. If wind blows from east and mango fruit drops from the tree then, it is believed that monsoon rains are on the way.
9. If butter-milk gets sour odour, peacock speaks frequently and water becomes warmer immediately in the glass then there would be rain.
10. If rainbow appears in the morning and sun rays assume reddish colour at evening then the probability of flood would be high.
11. If the dominant colour of spectrum is green in the rainbow the rain would be frequently.
12. If crow cries during the night and fox howls during the day, then there would be a severe drought.
13. If there are clouds and storm on the full moon day of the month of 'Maha' then there would be scanty rain.

Tree as a forecaster of Rain

"Farmers forecast the rain on the basis of flowering and ripening of the fruits of some trees. Rain is expected to start, when full blooming of the 'Ambli' tree (*Tamarindus indica*) take place. Ripening of fruits of 'Ankul' and 'Jambu' (*Syzygium cumini*) tree also indicate the commencement of rain".

Rathva Metrabhai Khalpabhai, Vill: Juna Zankhriya, Tal: Halol, Dist: Panchamahar, Comm. Subhash V. Parmar.

²Assistant Research Scientist, Agriculture research station, Gujarat Agricultural University, Bhachau, Kutch, Gujarat (India)

Insect Pest as a Forecaster of Rain

Farmers forecast the possibility of rain on the basis of appearance of pest. Appearance of larval pest (locally known as *zara*) in abundance on crop indicates, that there will not be rain upto 27 days. This pest can be found in only rainy season. It can not be destroyed by any means except rain water, so farmers do not take any preventive measures to control it.

Bharatsinh Mohansinh Mahida, Vill: Deshad, Tal: Valiya, Dist: Bharuch, Comm: Kadiwala U.A.

14. Eclipse of moon, asteroids and lightening on the full moonday of the month of 'Chaitra' indicate possibility of dry spell.
15. Thundr storm on the full moonday of the month of 'Vaishakh' indicates early withdrawal of monsoon.
16. Good foliage in 'Billi' tree (*Agele marmelos*) indicate subnormal monsoon.
17. Good foliage in 'Piple' tree (*Ficus religiosa*) indicates possibilities of adequate rain.
18. If a bird locally called as 'Titodi' lays eggs at higher elevation on ground then there would be high rainfall. (in North Gujarat, Peoples strongly believe that rain water flow, never touch the eggs of this bird, even if they are lying on the earth surface : Asso. Ed.)
19. If 'Zooa' (ecto parasite) starts biting then the rain is supposed to come earlier.

Proverbs from Orissa

- 1) If banana is planted in '*Jesty*' and '*Pandanas*' in '*Aashada*' month even if your throw/neglect them they will survive.
- 2) Planting of beetle vine in '*Sravana*' month will double the profit.
- 3) If you will not plant the *Amorphophalus* in '*Phalguna*' then you may not get back even the seeds. But if you will plant pointed gourd in the same month you will get a bumper crop.
- 4) Radish requires 16 times ploughing, its half times for cotton, its half for paddy but no tillage for beetle vine.
- 5) In day time rain, in the night sky full of stars. That year would be bringing tears to the earth.
- 6) If star is seen inside the ring of moon there will be heavy rain.
- 7) MOre mango, more paddy, more tamarind, definitely there will be flood.

(Source: "Madhuchakra", Vol. 1 (12), Oriya version of "Honey Bee", edited by Dr. R. Rath.)

20. When a bird call 'Bapaiya' signs song early in the morning it will rain in a day or two.

Peter wise, project coordinator, forest for people, Tanawalwila, Sri Lanka.

The farmers do not begin to prepare their fields in dry zone of Sri Lanka until they hear the cry of the '*pitta*' (*Pitta brachyara*). It is migratory bird and arrives in Sri Lanka around September. However, it is a weak flyer and takes advantage of the North-East monsoon winds. These winds blow the moisture laden air from the Indian Peninsular to Sri Lanka, that carries the rain needed for their '*Maha*' or major rice cropping season. The truth behind the superstition now is clear. The birds can not migrate until the monsoon begins. Hence their arrival is a signal that rains are due soon and the field preparation should begin. (Adapted from Sengnayake, F.R. The ecological, energetic and agronomic Systems of Ancient and Modern Sri Lanka) We have a similar practice about gam sowing in western Haryana linked with sighting of ; the bird '*Kunj*'; Ed.

Innovative Practices Contributed by Readers of Local Version

A. "Khedut Vigyan" Gujarat version of Honey Bee. Now it is refurbished as "Khedut Anubhav Vani" edited by Dr. B T Patel and Dr. Kalyanasundaram, GAU, SK Nagar - 385506.

1. Ahmedabadi D Kadiwala, Vill: Deshad, Tal: Valia, Dist. Bharuch

Whitefly control

Cotton is grown extensively in Valia taluka of Bharuch district. Whitefly is one of the most serious pests found in cotton. Farmers tried several insecticides and costlier synthetic pyrethroids too. But these insecticides did not give effective control on this tiny insect which sucks the cell sap of plant. Some farmers used 'gur' (jaggery) solution for control of it. One Kg gur is dissolved in 10-12 litres of water and filtered through a thick cotton cloth. Approximately 5-6 litres solution is sprinkled in one acre with the help of sprayer pump gently on the foliage. The tiny insects of whitefly are stuck on the leaf surface due to stickiness of the solution. All the stuck adults and eggs of whitefly are killed on the leaf surface only. (Higher concentration of sugar solution, outside the whitefly cell might cause flow of cell sap outside due to Osmosis : Asso.

Ed.) According to them repeated use of this practice increases stickiness on the leaf surface hence increases the possibility of occurrence of 'Madhiya' disease. Hence they prefer to use this practice once only.

This practice can achieve 40-50 per cent control of whitefly which is remarkably better than commercial insecticides. About 60-70 per cent farmers of this area are using this technique in the months of November-December.

2. Sudhirbhai D Prajapati, Vill: Miranvas, Tal: Danta, Dist: Banaskantha

Rabies

Generally, all the domestic animals suffer from this disease and if it is not controlled at early stage, chances of death are high. 'Kapur Kachali' and 'Ram Kachbo' are boiled in the water and stirred mixture is given orally to the suffering animal. This practice can control the disease if it is followed at initial stage of disease. Sometimes local tribals do branding on the animal's head to cure it. Branding practice is more painful but more effective than previous one.

Fracture/Dislocation

People bring the fresh wood of 'khakhra' (Butea monosperma) tree and cut it according to the length of fractured/dislocated part. Fresh wood is tied closely on the fracture/dislocated part. They also collect the growing primordia of 'Timru' (Diospyros melanoxylon) tree which are locally known as 'Va-hankadi', primordia are fed to the animal which is under this treatment. It is believed that his practice enhances the joining of fractured bones.



3. Oliyabhai Rupsinghbhai Vill: Mohbi, Po: Malsamot, Tal: Dadiapada, Dist: Bharuch.

Broken Horn

Flour made out of grains of 'Nagali' (*Eleusine coracana*) is pasted on the broken edge of horn. Wood of 'Modlu' tree is made into paste after removal of its bark, this paste is also applied on the broken edge of horn. These treatments help healing of horn and slowly that edge becomes tough and resistant one.

Ulcer

Sometimes large ulcer occurs on the skin of animal. If bone of dead dog is tied on a thread and is put around the neck of cattle, it is believed to cure the ulcer.

4. Vadher Jayrambhai H., Vill: Moti Chandur, Tal: Sami, Dist: Mehsana.

He shared the results of different practices of 'Khedut Vigyan' among farmers of his village. Infection of FMD had spread among the cattle of his village. He advises farmers to follow some of the practices of "Khedut Vigyan" to curbe FMD and find out the effectiveness of such practices.

In addition to this, he offered to furnish some appropriate practices with low cost farming, traditional wisdom for better understanding and solving of farming's risks and constraints. He also demanded better printing and binding of future issues of "Khedut Vigyan" Honey Bee so that it could be shared with larger number of farmers with out any damage.

5. Rathod Kansinh Khodsinh, Vill: Bhatia, PO: Mughasana, Tal: Prantij, Dist: Sabarkantha.

He suggested unique practice for promoting of fruit bearing in mango trees. A small slit of approximately 2" depth is made by an axe on the trunk of tree to remove bark from it. He tried this practice successfully on his orchard. According to him this practice is easier than debarking method of Tamilnadu which is referred in 'Khedut Vigyan'. (According to ther Head of Horticulture department, college of Agriculture, Depoli, Maharashtra, there are chances of heavy damage to xylem and phloem in debarking method due to either heavy or careless piercing of the bark. So this trunk slit may be easier as well as on safer method : ED).

Rat control

He described a successful as well as inexpensive practice of rat control which he himself has practiced. Approximately 4-5 pellets of camel dung are placed near all rat burrows in field and home. Rat moved away from that area without causing any destruction.

6. Parmar Dhulsinh Bhulsinh, Vill: Choryana Muvada, PO: Sodha Sal, Tal: Savali, Dist: Vadodara.

Milking of Animal:

Alum is dissolved in fresh water and given orally to the animal before milking. It is believed that it stimulates the milking. (Whether it has any relation with oxytocin stimulation remains to be explored : Asso. Ed.)

B. "Madhuchakra", Oriya Version of "Honey Bee" edited by Dr. Rath, NISTHA Bhubaneshwar, Orissa

Harvesting of Paddy

Dr. Maurya communicates an unique method of paddy cultivation in Faizabad district of Uttar Pradesh. Economically poor farmers first harvest early paddy by beheading the panicles only and leave the plant as such. If there is good late rain, they get second crop from the tillers which had not flowered earlier. And if there is no rain, only straw is harvested after attending to the harvesting of paddy from th eohter farmers field for wages. IN the first crop, approximately 7-8 Q/acre and from the second crop 2-3 Q/acre yield is harvested. (Time of flowering and crop maturity may be different due to diversity existing in the seed of paddy. There may be some mixture of another variety in the seeds which requires comparatively different temperature solar radiation and rainfall ultimately ultimately results in sterility or low bearing of plant in early stage. In latter season due to change in climate parameters and an increment of rainfall may enhance reproductive growth of those plants, :Asso. Ed.) (Comm. Dr. D M Maurya, Dean (Agriculture), NDUAT, Faizabad, UP.)

Botanical Insecticide and Weedicide

Leaves of 'Krada' plant are placed in the standing water of paddy as a result of that water becomes blackish in colour. It is believed that ie kills 'Gundhi' bug and some aquatic weed of the paddy. Innovative scientists of RRL, Bhubneshwar, Orissa have undertaken a study to find out its active principles. (Comm: Dr. Harihar Panda, Ex-Chairman and Managing Director the Agro Industries Corporation, Orissa)

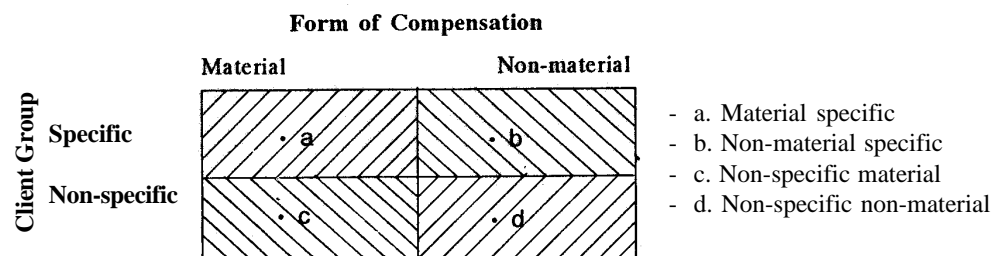
Survey of Farmers Innovations in Gujarat : Part II

Anil K Gupta and Kirit K Patel¹

Survey of local innovations developed by the farmers, artisans, pastoralists, fisher men and women etc., was started with the help of students of various rural Vidyapiths (colleges based on Gandian principles) in Gujarat in 1990. This was preceded by the work done by the first author in Haryana, Bangladesh, Maharashtra, Madhya Pradesh, Gujarat and Bhutan.

In the last we had presented 94 practices and this issue includes 50 practices from different parts of Gujarat. Many of these practices, we are realizing are found in other parts of the country and even the world. We are keen to pursue the linkage among these innovations. These could be autonomous, independent and simultaneous. In some cases, diffusion may indeed have taken place from one place to another. But in most cases it has not.

Many colleagues have raised the issue of mechanisms through which we should compensate the innovations in case specific innovations turn out to be commercially viable. In a recent paper (Gupta, 1991) entitled, "Sustainability through Biodiversity : Designing Crucible of Culture, Creativity and Conscience" (IIM working paper No. 1005) four kinds of compensation mechanisms have been suggested.



The material - specific compensation would include royalty payment to a particular individual or group thereof. The non-material specific would mean a reward of honour by means of recognition without involving any monetary disadvantaged groups. Such an institution would use the resources for the preservation and augmentation through experimentation and value addition in the innovations. This institute can also apply for patents and in due course use the surplus for modifying property relation in the local areas. The non-specific and non-material instrument of compensation would mean changes in the legal environment regarding the right of people over resources around which they have developed various innovative strategies of management.

We invite readers to write back about various innovative methods which can be used to compensate the innovators. We will give prizes for the best idea.

We are also starting a competition for contributions on technological as well as institutional innovations. There will be different categories for farmers, workers, scientists, activities and students. Please send your contributions as early as possible.

We look forward to your comments and suggestions for making for making this column more interesting and relevant to your concerns. It may not be out of place to mention that during recent discussions, the first author had with some of the scientists and organic farmers in Europe, a new possibility seems to have arisen. The European organic farmers are realizing that the scientific tradition in the west did not pursue development of organic technologies as

¹ Indian Institute of Management, Ahmedabad - 380 015

intensively as it did in case of chemical intensive technologies. Many of the farmers in third world because of their poverty, ecological handicaps or limited access to state and markets continued to survive through low external input agricultural innovations. These innovations for survival could become the building block for solving problems of farmers in developed regions of the developing countries as well as organic farmers in Europe. The issue still remains, how would we compensate these innovators such that their livelihood prospects improve and in the short run.

We are in touch with several like minded scientists and other colleagues to explore the possibility of developing commercializable technologies based on farmers' innovations in a manner that the farmers and workers gain more control over the returns to their innovations. We welcome ideas and suggestions in this regard.

Agricultural Practices

3101 Soil Management

3101.1 Improvement of Physio-chemical Properties of Soil

According to some farmers ash applied in seed beds and in the fields of onion before sowing and planting, helps in the development and improvement of quality of the bulbs. They prefer putting abundant ash in the field before each or alternate irrigation. Some farmers mentioned its good effect on the storability of bulbs. While others believed that incorporation of ash in the field reclaims the soil gradually. Gandhi Umarabhai Resulbhai Vill: Deshad, Tal: Valiya, Dist: Bharuch, Comm: Kadiwala U.A.

3101.2 Reclamation of Soil by Drainage

Farmers dig deep drainage channels around the salt affected fields, so that the rain water drains the field into these channels. Sometimes deep sub-channels are also prepared in the field according to its slope. These sub-channels deliver the collected water into main channel which is finally drained out. Farmers prefer to grow gram and cumin crops in the salt affected fields, but if soil is highly affected 'Ganda

baval' (*Prosopis* sps) is grown to reclaim it. Jadav Ramabhai Keshabhai, Dist: Kheda, Comm: Pudhiyar Ramajibhai M.

3102 Weed Control

3102.1 By Crop Rotation

Crop rotation is a well-known practice in this area for weed control. Other practices like interculturing and hard weeding are not so convenient due to the reasons like broadcast sowing, large size of land holding and sloppy as well as undulating land topography. 'Ramtal' (wild species of sesame) is grown in the field for suppressing the growth of weeds. More than 50% of the weed population can be reduced by growing it once. 'Ramtal' plant grows faster in the initial stage and suppresses the growth of weed. Badabhai Chamrabhai Vasava, Vill: Mohbi, Tal: Valia, Dist: Bharuch, Comm: Kirit K Patel.

3102.2 Weed Control for Sorghum

Sorghum is often infested by striga weed. It grows on the root of sorghum during winter and being a partial parasite it extracts nutrients from there. Farmers recognise it as 'Aagiya' and strongly believe that it hampers the growth and development of the earhead. They are very particular about its manual eradication as soon as it appears in the field. It also grows on sugarcane crop and affects yield and quality of canes. Two different methods are found in different regions for control of striga.

a) By Growing Seeds of 'Suva'

In Bharuch district (Gujarat) seeds of 'Suva' (*Anethum graveolens*) are incorporated with sorghum seeds approximately 3 to 4 kg/ha at the time of sowing to avoid the emergence of striga. 'Suva' has very slow growth. Its growth is suppressed at later stages due to shortage of light,

Fertility Management

Skelton of fish species like Bombay duck (dry left out portion) mostly in the pounded form is used in the fields where crops like chilly is grown. It is used very selectively for the cash crops like chilly, vegetables and such other high value fruity crop like grapes.

Comm: Dr. P. M Mane, Aga Khan Rural Support Programme (AKRSP), Ahmedabad.

water and nutrients. Hence there is no detrimental effect on the growth of sorghum. (We request readers to inform of any other crop used for similar purpose. The exact mechanism of 'Suva's effect remains to be documented: Ed.). This practice is well adopted in this area since a very long time. Ahmadbhai Daudbhai Ganchi, Vill: Deshad, Tal: Valiya, Dist: Bharuch, Comm. Kirit K Patel.

b) Cut Branches of Calotropis

Farmers divert the harvested rainwater of adjoining fields into the striga affected fields in Saurashtra (dry part of Gujarat).

Cut branches of calotropis (*Calotropis* sps) are kept at the entrance of the rain water channel. This practice reportedly minimizes the striga population to a great extent if repeated for several times during rainy days. Haribhai Devjibhai Patel, Vill: Bagadu, Tal: Mendaradu, Dist: Junagadh, Comm: Kirit K Patel.

3103 To Prevent the Shedding of Bloom

3103.1 By using Castor Oil

Flowers and young balls are often shed in cotton crop due to high temperature. To minimize this problem, farmers pour castor oil (approximately 50 ml) near the stem in the soil believing that it would cool the soil. This practice is well adopted among farmers who grow cotton for seed purpose but discouraged in ordinary cotton as castor oil is very expensive. This practice is in use since time immemorial. Umashinh Becharsingh, Karamiya, Vill: Deshad, Tal: Valiya, Dist: Bharuch, Comm: Kadiwala U.A.

Production of Yield

Paddy and maize give bumper yield in the year when 'Karamada' (*Carrissa congesta*) trees bear too much fruits. It is also believed that if 'Vika' trees give more fruits, then in the same year paddy is also expected to give higher yield.

Fulji Somaji Damor, Vill: Rajvada, Tal: Meghraj, Dist.: Sabarkantha, Comm: Ramsinh G. Thakor.

Sesame as a Striga Trap

Wazeye farmers of Nigeria incorporate Sesame seeds with millets to protect them against striga. This praitic plant entwines itself os tightly around millet's roots." "But when the Sesame grows up alongside the striga (locally known as 'mill'). Say informants, "this does not happens" Farmers claim the Striga wraps itself around the root of the Sesame, thus leaving the millet free. Ofcourse, the idea is very old among Nigerian farmers, but it seemed to be a new one to Agronomists consulted by the CTTA team. While some scientists agree that Sesame can work as a striga trap.

Source: McCorkle M. Constant et al. Al. Case study on Farmer Innovations and Communication in

3103.2 By Incorporating Pieces of Leather, Salt and Organic Matter

In case orchard beds of mango, sapota, ber, 2-3 feet deep trenches are dug around the tree in such a way that the small lateral rootlets of the tree are cut with minimum disturbance to primary roots. Approximately 20 kg. pieces of leather, 10 kg of common salt and two baskets (approximately 40-50 kg) of organic matter/FYM are added in the trench surrounding the tree and then covered with soil. This is practiced 15 days before the on set of monsoon with an intention to prevent the shedding of premature flowers and fruits and improve the yield. Zamalsinh Dajibava Barodhara, Vill: Deshad, Tal: Vaidya, Dist: Bharuch, Comm: Kadiwala U.A.

3104 Water Management through alignment of long channel

Shri Morubhai Vasava has dug a 1.5-2 kms of long water channel to irrigate his field on the hill, which is situated at a high elevation where there was no possibility of getting water except rain. A stream flows about 2 kms. away through an elevated part of an adjoining hill. He has dug a water channel from that point with the help of a 'Kudali', along the contour. A small reservoir has been prepared at the entrance of the field. Whenever he needs water for irrigation, he blocks the flow of water in the stream by making a bund and diverts it in to the field channel. He grows sugarcane, lemon, groundnut and other winter as well as summer crops with the help of this irrigation method. He

¹Comments given by Technical Committee on Livestock and Veterinary Science (TCL) consist of Dr. M B Pande, Dr. P R Patel, Dr. R R Momin and Dr. S K Modi from Gujarat Agricultural University, S K Nagar - 385506.

had personally dug out this water channel according to his own idea and never allowed others to use it. However, this year, he plans to allow some neighbouring farmers who offered help to repair the channel after monsoon (In Bhutan, farmers have built such channels as long as 30-40 kilometers: Ed) Morubhai Sojiyabhai Vasava, Vill: Malsamot, Tal: Valiya, Dist: Bharuch, Comm: Kirit K Patel.

Rain water harvesting

Farmers of village 'Churhudi' of Bihar had dug few wells in the middle of seasonal streams that get submerged in the rainy season. In winter season, vegetable crops are irrigated by lifting the water from those wells. The wells are kept shallow and so can easily be desilted as soon as it becomes empty.

Source: "Madhuchakra" (Oriya Version of Honey Bee)

3105 Post Harvest Technology

Fresh harvested bananas are kept in hot water for a short time after which the bunches are arranged closely and the room is fumigated. This practice helps the early ripening of the banana. Maganbhai Jethabhai Patel, Vill: Siyod, Tal:

Minimizing the Effect of Frost

Farmers practice fumigation and irrigation in the fields of cotton and cumin when they anticipate the frost. Fumigation is done by using dung cake, used engine oil or waste grass locally known as 'Dhumadiya'. They have been practising this for the last 20 years. Some farmers make tall hedges around the field to protect the crop from frost. *Harijan Alabhai Dahyabhai, Vill: Ratu, Tal: Sami, Dist: Mehsana, Comm: Kanti P. Gohil.*

Navsari, Dist: Valsad, Comm: Anil S Patel.

3106 Seed Selection, Treatment and Preservation

3106.1 Selection of Onion Bulbs for Seed crop

Farmers select onion bulbs which have not produced inflorescence in the field and dry them under the shade of a tree for

Raising of Fruit Bearing in Brinjal

One farmer in the village Lathodra of Junagadh district had applied 'Hing' (asphoetida) around the area where brinjal seedlings are transplanted. The result was more bearing of brinjal fruits. However, the farmer cautioned against the repeated use of this practice every year. The bearing of brinjal fruits over a period of time may then decline. Comm: Dr. P.M. Mane, AKRSP, Ahmedabad - 380 009

2-3 days. These dried bulbs are tied in a net like material and hung in the house till the next season to be used for growing seed crop. Gemabhai Ukabhai Chavda, Vill: Paniyala, Tal: Ghogha, Dist: Bhavnagar, Comm: Dhanjibhai B Boliya.

3106.2 Seed Treatment for Keeping stray animal away

a) Leaf extract of *Azadiracta Indica*

The juice of neem (*Azadiracta indica*) leaves is used for treating the seeds of sorghum. It is believed that this treatment imparts a poisoning effect in the plant. So stray cattle remain away from it. Lalbhai Dhirabhai, Vill: Sambhali, Tal: Shahera, Dist: Panchmahal.

b) Whey-milk

Farmers soak the seeds of castor in whey-milk before sowing. The idea behind this is to make the plant poisonous so that animals could be kept away from eating the crop (Use of whey milk as a seed treatment is a very old practice and dates back to First Century BC as per the records found in China. Readers may like to write back the differing or similar opinions : Ed). Rohit J Trivedi, Vill: Liliyamota, Tal: Laliya, Dist: Amreli.

Seed treatment for better germination of groundnut

Seeds of groundnut are smeared with lime solution before sowing. It is believed that it provides the necessary heat for the germination of groundnut seed. Comm: Dr. P.S. Reddy, Director, National Research Centre of Groundnut (ICAR), Junagadh.

3106.3 Preservation of Grains

a) 'Pete'

Farmers knit a container from paddy straw which is locally known as 'Pete'. First of all the tops of the straws are



trimmed to an identical length and are soaked in the water overnight. The water soaked straw of paddy is knitted around the bottom of a selected container. Thereafter the internal support is removed and the straw plastered with the help of dung and clay soil from inside. The upper portion, (upto mouth) is knitted and subsequently plastered. Farmers fill grains/seeds of cereals of pulses inside it along with ash to the brim. The upper portion is knitted in such a way that it makes the closure easy. Farmers believe that seeds/

Fruit Preservation

Cowdung is pasted on the stalk of ripe pumpkin to preserve it for longer time. According to the tribals it increases sweetness of pumpkin and prevents rotting. Actually, cowdung absorbs the extra moisture which is present in the fruit. It becomes sweet, as the high TSS content ultimately increases the keeping quality.

Source: "Madhuchakra" (Oriya Version of Honey Bee)
Edited by Dr. Rath, NISTHA, Bhubnesvar.

Weed as Preservation

Twigs from the morning glory bush (*Ipomaea fistulosa*) a common Indian weed, protects harvested groundnut plants and pods from termites. This has great relevance as 30% or more of the harvested product is often lost to termites during drying and there are many wild *Ipomaea* sps.

Comm: Narssa Reddy, Senior Manager, Canara Bank, Bangalore.

grains in a small quantity can be preserved for a longer time without spoiling. Sometime farmers use twigs of bamboo leaves instead of straw of paddy. Navasubhai Jivabhai Jadav, Vill: Kandha, Tal: Vasanda, Dist: Valsad, Comm: Ratilal R. Ganvit.

b) Ash

Ash is used for preservation of sorghum and pigeonpea seeds. Approximately ' kg ash is collected by burning of dung cakes. This will be sufficient for preserving 20 Kgs seeds. Seeds are smeared slightly by water (250-300 ml), then clean ash is dusted on the heap of seeds and mixed well by hands. Treated seeds are spread on levelled ground under sky for two days. Thereafter seeds are packed in bags or boxes which can last more than a year without any type of spoilage.

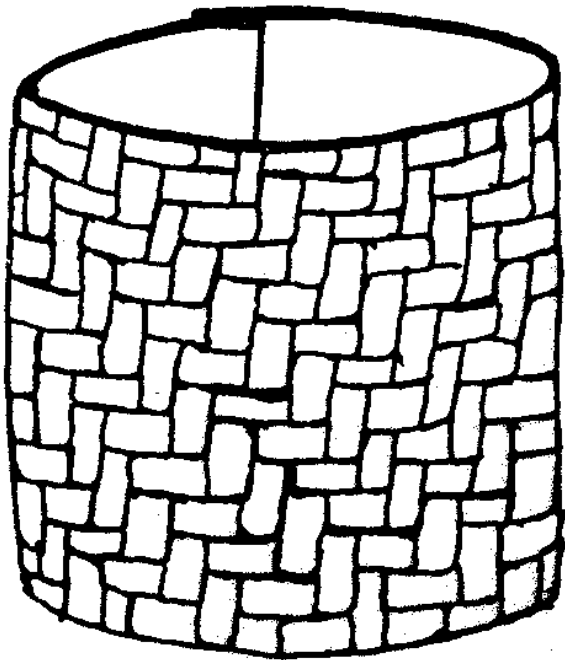
Sometimes leaves of 'Naffatia' (*Ipomoea fistulosa*) are incorporated in the sorghum and rice grains which are kept for consumption. It is believed that bitter smell of these protects stored grains against any pest. This method can also preserve grains upto a period of one year. Ahmadbhai D Kadiwala, Vill: Deshad, Tal: Valia, Dist: Bharuch (Readers of Gujarati Version).

c) Pit

Wheat seeds are preserved in a special manner. Approximately 2-3 feet deep pits are dug in the house/store room. The bottom of the pit is covered by a thin layer of wheat husk and filled with wheat. Each layer of wheat is alternated with a thick layer of husk and finally covered by soil. (Wheat straw absorbs moisture from the surroundings and keeps the seed dry : Kalyanasundaram). Dudhabhai Arjanbhai Pandav. Vill: Genol, Tal: Dholka, Dist: Ahmedabad, Comm: Jayrambhai K Sandhav.

d) 'Pila'

Tribal people prepare container out of bamboo which is locally known as 'Pila'. Women in the tribal communities prepare this type of containers. A sheet like mat is knitted from bamboo strips. Generally, dimension of the sheet is kept 15'x6' but it varies according to the requirement. A cylindrical container is made from the sheet by joining the ends of the sheet, which is pasted by cowdung from both sides and dried in the sun. The dried cylinder which does



not have a bottom or a lid is placed on the floor according to convenience. Paddy husk is layered at the bottom. Dried leaves of *Butea monosperma* are simultaneously kept vertically between grains and cylinder wall. The top of cylinder is also covered by dried leaves and paddy husk. Finally the container is sealed by plastering the mouth with cowdung. According to the users grains can be stored for more than one year without damage. Madhubhai Radakabhai, Vill: Khanta Amba, Tal: Vasanda, Dist: Valsad, Comm: Ratilal R. Ganvit.

3107 Disease Control

Farmers generally recognize diseases and insect pest by their local names which are based on very common symptoms. Hence it is difficult to diagnose the exact disease or insect from the local name, so some common local names of diseases in Gujarati language is used for some practices.

3107.1 Damping off

Tobacco seedlings raised in the nursery are more susceptible to Damping off disease in seed bed during monsoon. A mixture of ash (2-3 kg) and castor oil (0.7-0.8 kg) is spread on the seed bed of one 'Guntha' (0.01 ha) area to control this disease. This practice is followed 2-3 times at an interval of 7-10 days. Dhulsinh Bhulsinh Parmar, Vill: Choyna Muvada, Tal: Savli, Dist: Baroda, Comm: Natvarsinh B Gohil.

3107.2 Wilt of gram

This disease is locally known as 'Murchhai'. Seeds of gram are smeared with kerosene oil before sowing, to avoid 'Murchhai'. Farmers believe that it also helps in germination of the seeds. Savadiya Samratbhai Lakhabhai, vill: Enjar, Tal: Halvad, District: Surendranagar, Comm: Valaniya Ramsangaji.

3107.3 'Kokadava' of vegetables

This is a viral disease, spread by its vector *Bemisia tabaci*. Decoction of boiled bark of neem tree or tobacco is filtered and sprayed on the vegetable crops for urine daily over the vegetable crop is continued till it is cured. Maganbhai Hirabhai Patel, Vill: Nadan, Tal: Kadi, Dist: Mahesana, Comm: Anil S Patel and Narsubhai Gangabhai, Vill: Lachakadi, Tal: Vasanda, Dist: Valsad, Comm: Ratilal R. Ganvit.

3107.4 Blight of cumin

Farmers irrigate cumin crop only twice i.e. after sowing and at the flowering stage to avoid this disease 'Kaliya' (local name Blight of cumin) is characterised by stunting and the development of blackish colour in foliage. Gopalbhai Jivabhai Patel, Vill: Kahoda, Tal: Vijapur, Dist: Mahesana, Comm: Prabahad S Patel.

Tobacco Mosaic Virus

In Andhra Pradesh, to arrest the spread of Tobacco Mosaic Virus (TMV) from the infected to the healthy seedlings, the farmers dip their hands in a post containing milk while uprooting the seedlings for transplantation.

There is a detailed commentary on this practice in next issues: Ed. (Comm: Dr. Chari, Director, Central Tobacco Research Institute. Rajmundari, A.P. & Dr. P.S. Reddy, Director, National Research Centre of Groundnut (ICAR), Junagadh, Gujarat).

3107.5 Wilt of Pigeonpea

In Kheda district farmers incorporate the common salt in the soil for controlling wilt (locally known as 'Sukara') disease in pigeonpea. Farmers of South Gujarat plant the branches of 'Sinara' and 'Phanas' (*Artocarpus heterophyllus*) in paddy fields for eight days to avoid or control the wilt disease. However, some farmers have doubts about its effectiveness.

Shaikh Shabbirhusain U., Vill: Balasinor, Dist: Kheda and Harajibhai Ghedabhai, Vill: Ghodmal, Tal: Vasanda, Dist: Valsad, Comm: Ratilal R. Ganvit.

3107.6 Unknown disease

Farmers soak the old leather or hides (1-2 kg) of dead animals in about 10 litres of water for 24-36 hours. Thereafter the water is filtered out and sprinkled over the chilli plants. Spraying helps to control the unknown disease of chilli which is characterised by the withering of leaves and shedding of flowers and followed by the death of the plant. This practice begins at the appearance of the symptoms and is contained at 7-10 days interval. Majority of farmers cultivating chilli, brinjal, etc. are using this method since age.

Patel Hasmukhbhai Manilal, Vill: Sandhi, Tal: Padra, Dist: Vadodara, Comm: Chauhan Vijay Sinh A.

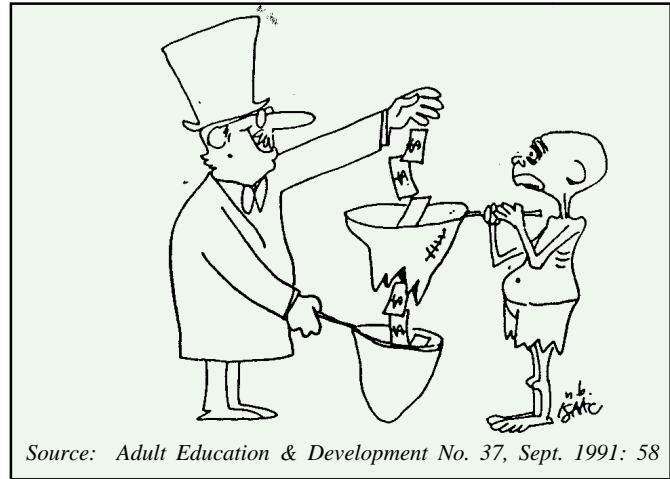
3108 Insect Pest Control

3108.1 'Lunkani' : Using water and kerosene

Suspension of water and kerosene oil is sprayed on the castor plants for controlling infestation of 'Lunkani' (local name of pest). Sometimes people carry out deep interculture operation, followed by heavy planking on standing crop to kill this insect pest. Revabhai Meharambhai Patel, Vill: Morvad, Tal: Vijapura, Dist: Mehsana, Comm: Ranjitsinh M Rathod.

Jadhav Jasvantsinh B., Vill: Villyampura, Tal: Prantij, Dist: Sabarkantha. (Reader of Gujarat version of Honey Bee)

He is surprised to know from "Khedut Vigyan" that the cultivation of castor reduces termite problem. However, his experience is just the converse-after removal of stem and branches at the end of the season, the roots which remained in the soil increases the problem of termite for the next crop.



Source: Adult Education & Development No. 37, Sept. 1991: 58

3108.2 Aphid

a) Fumigation of Bean Shells

Empty pod shells of kidney bean is burned with some green farm waste to fumigate the bean field to minimize the infestation of aphid.

Chaudhari Bhajanbhai Koldhubhai, Vill: Kamalzari, Tal: Vasanda, Dist: Valsad, Comm: Chaudhari Vasambhai B.

b) Ash

Ash is dusted on the lucerne (*Medicago sativa*) crop of controlling aphids. It is collected from either house 'Chulah' or by burning of dung cakes. This practice is followed for very long time. (Ash is one of the most widely used substances for this purpose. This is included in this collection only because of the range of crops and pests for which its use has been tried by the farmers: Ed) Vadher Nathabhai Bavabhai, Vill: Anvarpura, Tal: Sami, Dist: Mehsana, Comm: Kanti P Gohil.

c) Cow Urine

Urine of cow is sprinkled on the fennel (*Foeniculum vulgare*) crop to minimize the aphid infestation.

Keshavsinh P. Parmar, Vill. Vaghas, Tal: Kapadvanj vanj, Dist: Kheda.

3108.3 Termite

a) Incorporating tobacco into soil

Farmers collect residue of tobacco after harvesting. This waste material of tobacco is incorporated into the soil to control termite. Rojara Mansukh V., Vill: Dandava, Tal: Muli, Dist: Surendranagar.

b) Extracts of Roots of 'Nagali' and leaves of 'Naffatiya' for termite control

Root of 'Nagali' (*Eleusine coracana*) and leaves of 'Naffatiya' (*Ipomoea fistulosa*) plant are boiled and allowed to cool. Decoction is filtered and sprayed on the termite affected plant. Sometimes it is poured on the base of the stem so that it slips into the root zone area. Some farmers spray it on bean plants to control various diseases. Posalebhai Pandubhai, Vill: Borpada, Tal: Ahva, Dist: Dang, Comm: Ratilal R Ganvit.

3108.4 'Lashkari'

Farmers spray kerosene oil on the cotton crop at night to control larvae (locally known as 'Lashkari'). Farmers believe that this pest remains in the soil cracks during the day and attacks the crop at night. It attacks crop like cotton, lucerne in a cluster like an army brigade or formation. This might have been the reason giving it the name 'Lashkari'. Some farmers mix kerosene in the irrigation water. They make a hole in the bottom of a tin of kerosene and hang it on the top of a water channel in such a fashion that the tin drops kerosene slowly at regular speed and uniform suspension goes to the plot gradually. They believe that this is more effective than spraying because it kills all the larvae hidden in the soil cracks. Farmers realize that this practice also kills some of the beneficial organisms living in the soil. This practice is in use for more than 50 years and a large number of farmers are still using it.

Gemalsinh Mohansinh Rana, Village : "Deshad, Tal: Valiya, Dist. Bharuch, Comm: Kadivala, U.A.



'Hungo'

Sometimes maize is infested by 'Hungo' (local name of insect - pest). This pest damages the maize pollen. Tribals in the forest use several physical methods to control its infestation. Sometimes adult insects (may be beetle) are soaked for few minutes in the kerosene and released again the field. According to them, remaining untreated insects also fly away. (This treatment may be causing sterility in insect which may be transferred to untreated insect, when it mates with treated insect: Asso. Ed.).

Vasava Gujaribhai: Vill: Monbhi, P.O: Malsmot, Tal: Dadiapada, Dist: Bharuch, Comm: Kirit K Patel

3108.5 'Katra'

Farmers broadcast the leaves of calotropis (*Calotropis* sps) in the standing crop which is infested by 'Katra' (local name of army worm type of cutting insect larvae). 'Katra' gather on the broadcasted leaves of calotropis and next day they collect all the leaves along with insect larvae. Simultaneously, fresh leaves are replaced there. The collected leaves with larvae are destroyed immediately. Jesalbhai Ranchhodbhai Raval, Vill: Soja, Tal: Vijapura, Dist: Mehsana, Comm: Ranjitsinh M. Rathod.

3109 'Galsundha'

A disease characterized by swelling of the throat, which is locally known as 'Galsundha'. Two methods to cure the disease were found in South Gujarat which are given below:

Will you stand by the intellectual property rights of peasants?

Animal Husbandry Practices

3109.1 Flowers of *Madhuca indica* and Bark of 'Khajur'

Dried flowers of 'Mahuda' (*Madhuca indica*) and crushed bark of 'Khajur' (*Phoenix sylvestris*) tree are fed to the animal with green fodder to control the 'Galsundha' disease. Animal swallows this mixture very slowly due to pain and offensive smell of 'Khajur's bark. Approximately 150 to 250 g mixture is fed to the animal per day in which the proportion of 'Khajur's bark should be more. This treatment is effective if it is followed at the early stage of the disease. Thakorbbhai Chhotubhai Naik, Vill: Moldhra, Tal: Navsari, Dist: Valsad, Comm: Ratilal R. Ganvit.

3109.2 Different Parts of Local Creepers and Trees

Dried flower of *Madhuca indica* (about 150-200g) spines of 'Karval', bark of deshi 'Khajur's (*Phoenix sylvestris*)



fruit, bark of 'Indrajav' (*Holarrhena antidysenterica*) and either bark or fruit of 'Hadena Amba' (*Dendrophthoe* spp.) are pounded together. The pounded mixture is given orally to the animal to cure 'Galsundha' disease. Sometimes pounded spines of 'Karval; alone are pasted externally on the swollen part of the throat. According to the users, this

practice cures the disease within a week. It is continued at an interval of 1-2 days regularly till the recovery. 'Hadena-Amba' (*Dendrophthoe* spp.) is a parasitic shrub, generally, it grows on banyan tree. (This method is not considered useful in acute case of 'Galsundha' by some of the scientists. However, I feel more investigation is needed : Ed). Lalajibhai Indubhai, Vill: Ghodmal, Tal: Vasanda, Dist: Ratilal R Ganvit.

3110 Flatulence

Flatulence is locally known as 'Afra'. It is a very common trouble during monsoon due to excessive grazing or feeding of green fodder. Animal feels unesiness, restlessness and stomach looks like drum. In extreme case it may cause death of the animal.

3110.1 Mixture of Whey milk, Onion and Leaves of *Annona squamosa*

Mixture of whey milk, onion and leaves of 'Sitafal' (*Annona squamosa*) is given to the suffering animal. (Mixture is innovative except leaves of *Annona squamosa*, acts as surfactant and carminative:TCL¹).

Hirabhai Dhanjibhai Deddu, Vill: Ranjedi, Tal: Meghraj, Dist: Sabarkantha, Comm: Amrutbhai D. Chavda.

3110.2 Mixture of 'Ajma', Onion and Aerial Root of *Ficus benghalensis*

Mixture of 'Ajma' (100 g) onion (200 g) and aerial root of banyan tree (*Ficus benghalensis*) is fed to the animal for controlling Flatulence. This practice is being followed in the village for a number of years. (This mixture has

carminative and Stimulant action: TCL) Parmar Adarsinh Motisinh, Vill: Ganeshpuri, Tal: Halol, Dist: Panchmahal, Comm: Sukbhash V Parmar.

3110.3 Tuber of 'Kund'

Farmers collect the tuber of 'Kund' (*Scilla* spp) plant. Its

tuber looks like tuber of elephant foot and sprouts in monsoon season only. Small pieces of this tuber and bulb of onion are pounded separately on a stone slab and mixed in equal proportion. Approximately 200 gm of pounded mixture is given to the animal. Before giving the mixture they apply common salt on the tongue of the animal. This treatment is followed twice in a day for two consecutive days. Farmers do not give green fodder during the treatment. (The effect of 'Kund' plant as an antinflucence is unknown: TCL).

Kalubhai Lahanbhai Ganvit, Vill: Ghodmal, Tal: Vansada Dist: Valsad, Comm: Ratilal R. Ganvit.

We invite readers to give their reactions on either some practices or comments of other scientists.

3110.4 Mixture of Turmeric, Onion and Whey milk

The suspension of onion, and turmeric powder mixed in equal quantity in whey milk is given to the animals. Proportion of whey milk is kept more than double in volume to the other ingredients. (The mixture is innovative and appears scientific as it has surfactant, carminative and antibacterial action: TCL. This is one of the few practices which scientists have unhesitatingly endorsed. We hope it will form part of extension package Ed.)

Karansingh Manilal Rathod, Vill: Sutaria, Tal: Balasinor, Dist: Kheda, Comm: Harjibhai B Solanki.

3110.4 Suspension of Edible Oil, Kerosene and Water

Suspension of edible oil (100 g), water (200 g) and kerosene oil (10 g) is given to the animals which have problem of Flatulence. (The mixture has surfactant action TCL.) Patel Chaturbhai Bavalbhai, Vill: Ganjela, Tal: Dhagandhra, Dist: Surendranagar, Comm: Kirit K patel.

3111 Gastric Trouble

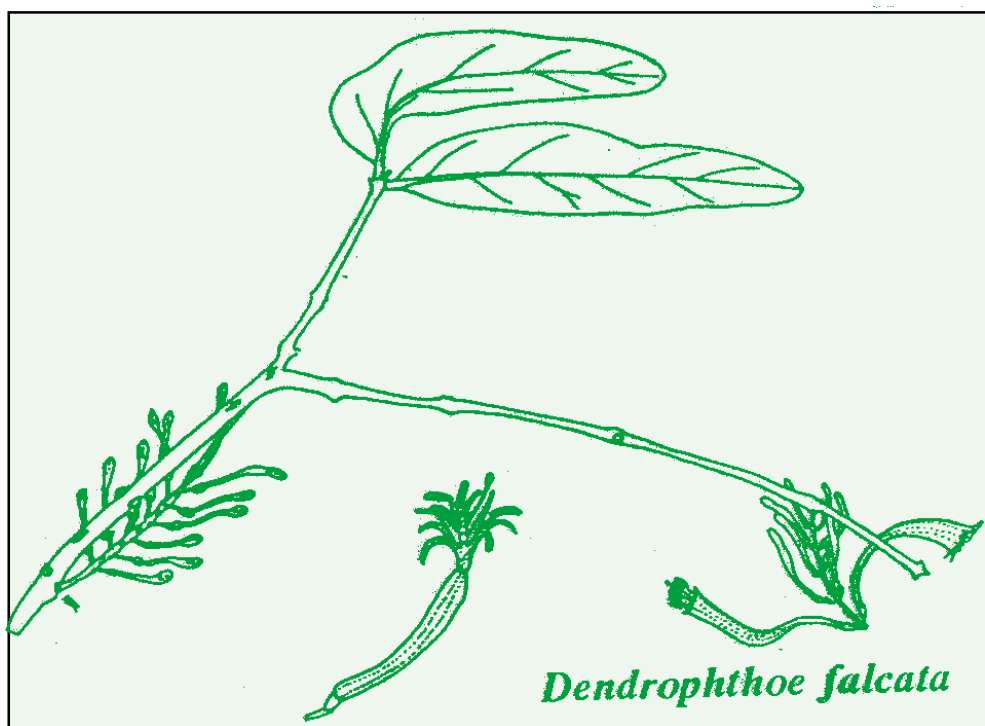
Approximately 10 g of 'Hing' (asphocteda) is dissolved in 500 g edible oil and the mixture is given to the animal to get relief from Gastric trouble. (The mixture has carminative and soothing action : TCL) Tejabhai Gangajibhai Rabari,

Vill: Jitoda, Tal: Chansama, Dist: Mahesana, Comm: Anil S Patel.

3112 Constipation

3112.1 Leaves of *Gardenia resinifera* and seeds of *Dendrophthoe falcata*

Leaves of 'Dikkamani' (*Gardenia resinifera*) and seeds of 'Bendval' (*Dendrophthoe falcata*) plant are pounded on the stone and the resulted paste like mixture is fed to the animal. This treatment cures the Constipation trouble within a day. *Gardenia resinifera* is a shrub. It bears small leaves and secretes gummy matrix or sap at the detached end of leaf



and stem. *Dendrophthoe falcata* is also a parasite on mango plant and known also as 'Vanda'. It bears fruit in winter and summer seasons. People collect the seeds and preserve them for future use. There is no side effect of this treatment. (These product of plant have laxative action: TCL) Madhubhai Somabhai, Vill: Rapkas, Tal: Ahva, Dist: Dang, Comm: Ratilal R. Ganvit.

3112.2 Mixture of Leaves of 'Vakhada' Boiled Wheat and Pods of 'Deshi Baval'

Mixture of 'Vakhada's' (*Salvadora* spp) leaves, boiled wheat and pods of 'Deshi Baval' (*Acacia* sps) is fed to the animal for minimizing the Constipation. (The laxative effect of mixture requires verification: TCL). Mansinh Motisinh Rathod, Village: Khadat, Tal: Vijapur, Dist: Mehsana, Comm: Ranjitsingh M. Rathod.

Letters to the editor

We are quite overwhelmed and excited at the response (more than 300 letters, faxes and E-mail), we received from various quarters. This gives us hope and also increase our responsibility. Selecting letters for this issue was an uphill task, for the simple reason of not being able to choose what letter to print and what not to print. However, we hope that our readers would understand our dilemma and continue to correspond with us. Excerpts from some of the letter are produced and some of the letter are abstracted here.

I **Institute for Social and Economic Research**
S University of Durban-wesville
E P/B X540001
R Durnam 4000
 Telefax : 820 2834

Mr. Tim Quinlan
 Research Officer
 Phone: 820 2481

**S.B. Kadrekar, Vice-chancellor, Konkan
 Krishi Vidyapeeth, Depoll, Maharashtra**

He believes that traditional agricultural practices if modified suitably with systematic and scientific approach are quickly and easily adopted by the farmers. From this point of view, Honey Bee

could act as a mediator between farmers and research scientists. In other words, it has an important role in developing cheap and particularly feasible technology to augment agriculture production. He has sent this newsletter to some concerned scientists of his university to throw light on farmers creativity.

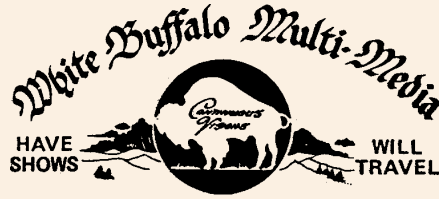
MEMO

Dear Anil,

I apologise for not responding earlier to your letter and inclusion of a copy of "Honey Bee" is a very good idea and it has stimulated a small project I started on Herbal Veterinary Medicines used by Bastofo herders. I do not have much information yet but it is slowly being acquired. Besides that, thank you for providing an idea which I have communicated to local NGO's too.

Ms. Daphne Thuvesson, Editor, Forests, Trees and People Newsletter, Swedish University of Agricultural Sciences, International Rural Development Centre, Sweden.

She offered to spread this philosophy and activities carrying out to put it into practice through **Forests, Trees and People Newsletter** which has network in more than 100 nations. According to her, by organizing activities like travelling workshop, compiling proverbs, documenting local innovations, stimulating an exchange of information about innovative practices can provide very interesting ideas for their members and may provide the spark needed for them to start such activities in their respective areas. Somehow, her enthusiasm for 'rapid methods' which to us appear as 'unethical' and 'unprofessional' as a category, has perhaps diluted her enthusiasm for 'Honey Bee'. But we still find her comments very meaningful. "I think these types of surveys can take many different forms and in fact would even consider the surveys you are doing on farmers innovations, as well as your travelling workshops, as qualifying. I think the main question that needs to be posed before any such activity is carried out is WHY it is being done. The answer to this question will separate the good from the bad and also provide help in deciding whether a "rapid" survey will suffice".



P.O. Box 73 • Woodstock, NY 12498 • (914) 246-9995

Scott Anderson

Dear Anil,

My apologies for not replying sooner to your letter. I was out of town for a good while, and there was much correspondence waiting for me. I also wanted to have time to look over your papers and publication "Honey Bee". I am thrilled that someone is making strong, mutually beneficial and respectful alliance between farmers and scientists. In this critical phase of the human and planetary history, it is essential that, as you say, "natural scientists consider research on indigenous knowledge systems as a necessary compliment of the formal laboratory research". I am sharing the publication with a friend who is researching hydroponic agriculture. I know little of farming, except that there is a growing movement to discover more about indigenous seeds and methods.

Our very best wishes on your extremely important work.

Comments on Title, Format and Periodicity of Newsletter

1. The comments of newsletter is quite informative and useful, though much can be done to improve the format by adding visuals, sketches and spacing out the written matter a little. (Snehlata Nath, Development Alternatives, New Delhi).

(We hope you will like this format: still we are waiting for your critical comments: Ed.)

2. To improve readability, the format of the news letter need total change. "One page - One theme" may give better understanding to readers. (Dr. R. Ganeshan, Ph.D., Project Officer (AICRP/ICAR), Horticulture college, Madurai).
3. Publishers have under estimated readership of the newsletter i.e. "Khedut Vigyan". It should be sturdy enough to stand fifteen-twenty hands and should have column for proven technologies too so that the reader can have choices. (Vadhen Jayrambhai H., At & P.O. Moti Chandur, Tal: Sml, Dist. Mehsana).
4. He suggested little 'Ajamavi'-ne-Janavo' which means that "please try and inform us". He also advised for four issues of this newsletter to be sent to each agricultural school, and village library for better utilization of information. (Shri Thakarbai Vanjara, At & P.O. Dechaka, Tal: Meghraj, Dist. Sabarkantha).

News and Views

**Travelling Workshop of Artisans:**

We had invited about 35 innovative artisans during April 1990 and May 1991 at the Institute to discuss their innovations. The process was very educative for us. Several innovations were discussed (for detailed information please see H.Vol.3(2)). One artisan got inspiration from an elevator to design a rig for drilling a bore. Another looked at balance of the vegetable vendor in which one of the weighing pans could be unhooked by a flicker of hand to empty the contents. He developed a liver system to unload tractor by the driver with the help of hook and lever system. This may be a laborious way of developing what already exists elsewhere. But the inventiveness of the mind of these artisans had to be appreciated.

Another (Shree Amritbhai Agravat) had developed wheat sowing box in semi arid regions. The idea was to use this box so that instead of seeds falling in a narrow row one over another, they fell in broad furrow using the moisture in a broad set and furrow system developed by the

farmers. Another example is that of ground nut digger. It improves the performance by 70-100 per cent. Development Education Communication Unit of Indian Space Research Organization, Ahmedabad has made a film of four of these

innovations in Gujarat. This was broadcasted by local television station last September. Those of you interested, in this film may write back to us. It is in Gujarati. We will send a note in English to make sense.

Support 500 Years of Indian Resistance South & Meso American Indian Information Centre (SAIIC) is serving as a liaison between the North, as well as educating the general public about what the past 500 years has meant to Indian people through out the America and how we are streteging for change.

Indian people are not the only victims of this history of colonization. African-Americans, brought to this continent as slaves, the Mestizo population, and many others continue with us in our struggle for freedom, justice and respect. We call for a unified cross-cultural resistance to the new colonialism being waged under such guises as the current roundl of trade talks under the General Agreement on Trade and Tariffs (GATT).

The crises facing Indian people today are many: massacres continue in Guatemala, our communities are militarized under the pretense of a war on drugs, rainforests are undr constant attack, natural resource extraction contaminates our landsin Alaska, the Amazon and the coasts. We must call for recognition of Indian and all human rights by 1992; recognition of Indian territories, subsistence rights, cultural rights, rights to educate our children and plan our future.

We urge you to become involved! Find out how 1992 is being portrayed and celebrated in your community. Demand that the truth be taught in schools.

There exist many myths among Indian people from all over the American which say that the current period of oppression will last for 500 years before we enter a period of change (Puchukutik) and the oppression will end. We believe we are now in 'Puchukutik'. Join us in support of Native peoples in 1992 and beyond.

Please contact organizers at:

SAIIC, P.O. BOX 28703, Oakland, CA 94604, USA
(415) 834-4263

BOOKWORM

An Appeal!

No control measures, needed for this 'worm'. Please send us Books, reports and detailed studies for review: Editor.

1. Book

Natural Crop Protection in the Tropics-By Gaby Stoll.

This book provides an excellent overview of the traditional as well as modern scientific knowledge on natural methods of plant protection. In the Third Improved Edition of 1988, Gaby Stoll has furnished detailed information on more than 15 plants of pesticidal value. Other innovative methods of crop protection based on local farm resources used by farmers of tropical countries are given with beautiful illustrations. The countries are given with beautiful illustrations. The information on life cycle, nature of damage, host preference and control measures of major field as well as storage insect pests are presented in a systematic manner so that it can be used as practical guide by all those interested. It is available in English, French, German, Thai and Spanish version from : **Margraf Publishers Scientific Books, Muhistr 9, D-6942, Weikersheim, FR Germany.**

2. Proceedings

Proceeding of Workshop on Farmers' Practices and soil and Water Conservation Programmes at ICRISAT Centre, India

With an intention of establishing

dialogue and linking the experiences of farmers, researchers, government officers and NGOs in the field of Soil and Water Conservation (SWC), the workshop was organised at ICRISAT Centre, India during 19-21 June, 1991.

Indigenous soil and water conservation technologies developed by farmers were documented and analyzed in terms of effectiveness and adoption levels. Success as well as failure of various SWC projects Focussed on participatory planning and implementation were made to develop excellent strategies for SWC projects based on indigenous approaches and participatory planning.

The proceeding is available on request from Dr. J.M. Kerr, Director, ICRISAT, Patancheru, Andhra Pradesh - 502 324, India.

3. Research Paper

Plant Disease Management Practices of Traditional Farmers - By H. David Thurston

Very few plant pathologists and others in the hard agricultural sciences have tried to elucidate principles and practices of traditional agriculture which can be used for future management of plant diseases. Dr H. David Thurston had explained how combination of broadleaf weed mulch and beans called as '*Frijol tapado*' in Northern coasta Rice prevents common Web Blight. Traditional practices of raised fields, raised beds, ridges and mounds in Mexico and Gautemala, Peru and Asia reduce diseases effectively. While in Peru,

Munshi Raghunathamal Rai, Asst. Superintendent (Revenue Dept.), Jodhpur was working during the regin of Kind Umedsingh Bahadur in 1936. He has collected several agricultural practices existing during that period. These have been published in series of books in Hindi. Those interested please write to us : Ed.

Potato cyst method is controlled by practising fallow and specific crop rotation. Role of biodiversity and cropping systems in minimizing various disease in household garden of Java are discussed throughly. Importance of many other practices of traditional farmers like flooding, using organic matter, sanitation, manipulation shade, time of planting, adjusting crop density, altering plant and crop architecture, planting without tillage for disease management are emphasized in the text.

Studies of traditional practices have special importance for third world because of their intensive labour requirement and little need of skill as well as restricting of existing society for adoption.

Copy of this paper canbe had on request from Dr H David Thurston, Cornell University, Ithaca, NY. Those interested in more information must buy his recent book, " Sustainable Practice for Plant Disease Management in Traditional Farming System." It is an excellent contribution and easily qualifies to be the best book I have read during last one year on the subject.