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FROM DIRECTOR'S DESK

Climate Change and lac crop

Lac crop is vulnerable to climatic vagaries like many other agricultural crops and more so as it remains permanently attached to plant host from which it derives its nutrition. The lac insect cannot, therefore, resort to avoidance behavior towards direct sunlight, heat, rains, etc. Since it is parasitic on the plant, its survival is also dependent on the health of the plant, which in turn can be affected of climatic vicissitudes. Deviations from the normal patterns of climatic



parameters are seen more commonly in recent years affecting cropping and agricultural productivity; lac is no exception to this.

Insects are highly responsive to changes in temperature and humidity and different species respond differently to variations in these parameters. Their response to climate change would depend on the threshold level of temperature for development and their life cycle period. It has been reported that insects with shorter life cycles show greater fluctuations due to changes in temperature variations.

The Indian lac insect is associated with

a large pest complex comprising mainly of predatory and parasitic insects. Seventy-two species of such insects have been reported, which are either pests of the lac insect and their predators. But only a few of them are important from lac production standpoint, which cause significant injury to lac crop. Twenty-one species of insect parasites have been reported, on

different species of *Kerria*. Parasites can be expected to be highly responsive to temperature changes in view of their relatively short life cycle periods. Thus species not recognized as economically injurious can become so as a result of climate change. Besides, different developmental stages of lac insects would also vary for their vulnerabilities to their parasites.

The lac production in India is derived from two types of insects, called *rangeeni* and *kusmi*, commonly known as strains of the Indian lac insect. Both the insects complete two cycles per year producing two crops. But these two forms differ for life cycle patterns due to their genetic differences in their developmental response to temperature. Thus these two forms of the lac insect could also exhibit differences in their vulnerability to deviations from the normal climatic conditions. The lac production of the country can be viewed as the summation of the contribution of four crops, contributed by two crops each of the two strains. Large deviations in the relative contribution of these crops have been seen in recent years, compared to long-term averages. The relative contribution of *kusmi* crops, which yield superior quality resin, has increased to over half of country's lac production compared to about 20% earlier. This change had been due to Institute's proactive role of promoting *kusmi* lac production, especially on *ber* during winter crop season. But, decrease in *rangeeni* crop production, especially during summer had also been contributing to this change, which is

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viewed largely as a result of climate change.

When we look at the deviations in normal weather pattern from summer lac crop cycle standpoint, some interesting facts are seen. Besides the erratic monsoon rain patterns and total rainfall received, post monsoon periods also appear to be equally important for lac crop. A look at the maximum and minimum temperatures; relative humidity and rainfall during Oct. last year to May this year covering winter and summer seasons compared to last ten years, recorded the weather centre of the Institute reveal interesting features.

The mean minimum temperature was higher in pre- and post-winter months and lower in peak winter months (December and January). The mean maximum temperatures were more are similar compared to averages of last decade, but March-April temperatures were higher (0.5-1.0°C). A look at rainfall and RH show very distinct deviations; the winter and summer period (December-May) was extremely poor (total 57mm) compared to ten-year mean for the same period (130 mm). This was associated with lower humidity during these months; the mean RH was lower by 3-20%. The summer months (March-May 2010) were particularly very dry with mean lower RH of 9-20%. Thus, to summarize, last winter and summer months were warmer and drier compared to decade's averages.

The summer crop of *rangeeni* had been showing unusually high mortality rates during recent years, especially during January-March, which occurs before the sexual maturity stage of the lac insects. This had resulted in crop failures. A team of experts at the Institute is studying to understanding the underlying factors for such unusual mortality of the lac insects. Planned experiments were conducted to study the probable causative factor(s) of pre-summer *rangeeni* lac insect mortality at the Institute; samples from farmers' fields Jharkhand and West Bengal were also periodically obtained for examination. The lac insect populations on the host *bhalia* showed unusual mortality in January and analysis of the affected populations showed about 57% mortality; closer examination of the living insects revealed 57.6% parasitization with the endoparasite, *Aprostocetus purpureus*. Further, examination of other affected samples from four different locations including the Institute farm showed an average parasitization of 54.3%. This parasitoid emerged at the rate of 248 - 364 in January and at 416 - 573 in March per 10 cm length of lac encrustations, which is indicative of very high level of parasitization leading the collapse of lac insect populations.

These observations reveal that how changes in weather conditions could lead to a flare of certain insect populations with devastating effects. Careful studies are

therefore required not only to understand the nature of such changes in the climate but also its impact on insect populations of interest so that appropriate strategies can be worked out. Explosion of parasitic population associated with lac insect another such instance, which needs immediate attention due to its implication on lac production. It is hoped that suitable remedial measures will be worked out to tackle this new threat to lac cultivation.

(R Ramani)

RESEARCH HIGHLIGHTS

Insect Improvement

Barcoding of lac insects using cytochrome oxidase I gene

Cytochrome oxidase I gene (COXI) has been approved for universal barcoding of life. The sequence information is used for precise identification and understanding the relationship of populations. The universal primers recommended by Folmer *et al.* (1994) generally used for amplification of the target region of COXI did not produce satisfactory amplification in the Indian lac insect, *Kerria lacca*, which has been found due to mutations in the primer binding region. A new set of primers have been designed based on the conserved regions of the target gene and 650 bp region of COXI has been amplified. Analysis of sequence data of the amplified region of 28 lines of *Kerria lacca* and one each of *K chinensis* and *K sharda* has been done. The analysis confirmed the subspecific status of *kusmi* and *rangeeni* forms; *K sharda* did not show sufficient divergence required for a species as assessed by disparity index. This method will be used for barcoding the lac insect collections of the National Lac Insect Germplasm Centre (NATLIGEC) of the Institute.

(S K Ranjan and R Ramani)

Host Improvement

Evaluation of Kusum plants for pubescent leaf - a variant

It was observed that the clones of one of the productive genotypes of *kusum* identified at the field area at Hesal, Ranchi dist. showed



Kusum leaf showing pubescence on lower side of leaf and midrib

pubescence of leaf lamina. The study revealed that pubescence is mainly present on lower side of leaf, leaf

petiole, leaf midrib and young branches. The density is more in leaf midrib region than the leaf lamina. The presence of this character is under evaluation from lac productivity point of view.

(Vaibhav D Lohot)

Crop production

Management of sooty mould through fungicides on kusmi lac

An experiment was undertaken to study the effect of eight fungicides on sooty mould growth and on yield of kusmi lac on ber. Fungicides were applied thrice 50, 100 and 120 days after inoculation. Sooty mould growth and lac yield were recorded at harvest. Maximum sooty mould reduction was achieved by ridomil, hexaconazole and chlorothalonil. Copper oxychloride showed toxicity to lac insects. Lac yield was increased by spraying of chlorothalonil (81.5%), hexaconazole (63.9%) and ridomil (59.7%) over control.

(A.K. Singh)

Ant-lac host plant association

Ants were reported to be associated with all major lac hosts earlier. Some of these ants were found damaging cultures in the Field Gene Bank of NATLIGEC. Therefore, different types of ants, irrespective of their interaction with lac insect / host plant were collected from the Institute Research Farm for identification. These ants have now been identified as *Camponotus compressus*, *C. dichrous*, *C. parius*, *Crematogaster subnuda*, *Lepisiota capensis*, *Leptogenys diminuta*, *Lophomyrmex quadrispinosus*, *Monomorium scabriceps*, *Myrmecaria brunnea*, *Oecophylla smaragdina*, *Pachycondyla tesseronoda*, *Paratrechina longicornis*, *Pheidole indica*, *Pheidologeton affinis*, *Tapinoma indicum*, *Tetraponera allaborans* and *T. rufonigra*.

(K.K. Sharma)

Soil fertility management of ber for shoot growth and lac yield (aghani)

Application of 200 g N, 150 g each of P₂O₅ & K₂O and liming @ 2.25 kg/ tree is recommended for use in winter season kusmi lac cultivation. Potassium application @ 150 g/ tree in the soils having pH 4.5-5.3 can increase lac yield to the tune of 32% over control. Practice of liming on soils with pH 5.6 or above is not recommended as it can reduce lac encrustation thickness to the tune of 20% than that when liming is done at pH 4.8 at Ranchi conditions. Liming could increase soil potassium content (11%), pH and E.C. values significantly. Application of phosphorus and potassium could significantly decrease soil nitrogen content to the tune of 6 and 11%, respectively. On the other hand, application

of phosphorus could increase soil potassium (8%), pH, E.C. and organic carbon remarkably.

(S. Ghosal)

Impact of pitcher irrigation on kusmi lac yield on ber

A study was conducted at the Institute Research Farm on impact of pitcher irrigation on kusmi lac yield on ber.



Pitcher irrigation on ber

The data revealed the increase in shoot length and girth during lac crop period to the tune of 38.9 and 23.3 per cent under pitcher irrigation as against 19.2 and 9.8 per cent under control, respectively. The broodlac yield ratio harvested during mid July in case of pitcher irrigation was recorded to be 1: 3.9, while it was 1: 0.10 in case of control. For winter season kusmi lac crop the broodlac ratio under both the treatments were at 2.9:1.

(R. K. Singh)

Lac production in India during 2009-10

On the basis of survey in the markets of different lac producing districts and states, the estimated national production of sticklac during 2009-10 was approximately 16,495 tons. Jharkhand state ranked 1st followed by Chhattisgarh, Madhya Pradesh, West Bengal and Maharashtra. These five states contributed around 95 per cent of the national lac production. Contribution of Jharkhand in national lac production was 41.98 per cent followed by Chhattisgarh (30.28 %), Madhya Pradesh (14.49 %), West Bengal (5.18 %) and Maharashtra (3.15 %). Regarding share of different crops, jethwi ranks 1st (42.55 %) followed by baisakhi (34.62 %), aghani (14.40 %) and katki (8.43 %) in national lac production. In the year 2009-10 the production of baisakhi, and jethwi crop has increased by around 11 per cent and 133 per cent, respectively while production of katki and aghani crop decreased by 73 per cent and 39 per cent, respectively in comparison to last year. At national level, the production of lac was around 4 per cent less than the last year arrival.

State-wise Lac production in India during 2009-10

| State | Total production (in tons) | Share in total Production(%) |
|----------------|----------------------------|------------------------------|
| Andhra Pradesh | 35 | 0.21 |
| Assam | 100 | 0.61 |
| Chhattisgarh | 4,995 | 30.28 |
| Gujarat | 65 | 0.39 |
| Jharkhand | 6,925 | 41.98 |
| Madhya Pradesh | 2,390 | 14.49 |
| Maharashtra | 520 | 3.15 |
| Meghalaya | 10 | 0.06 |
| Orissa | 400 | 2.42 |
| Uttar Pradesh | 200 | 1.21 |
| West Bengal | 855 | 5.18 |
| Total | 16,495 | 100.00 |

(G Pal)

Global consumption of lac

The average annual consumption of seedlac and other value added products is around 18,065 tons. USA is the largest consumer of lac in the world and consumes around 33 per cent of global consumption.

Average consumption of lac in the world

| Country | Average annual consumption (tons) | Share in total consumption (%) |
|-----------------|-----------------------------------|--------------------------------|
| USA | 6,000 | 33.21 |
| India | 3,000 | 16.61 |
| China | 1,700 | 9.41 |
| Egypt | 900 | 4.98 |
| Indonesia | 1,000 | 5.54 |
| Pakistan | 1,150 | 6.37 |
| Bangladesh | 900 | 4.98 |
| Japan | 600 | 3.32 |
| Spain | 430 | 2.38 |
| Nigeria | 330 | 1.83 |
| Germany | 275 | 1.52 |
| Thailand | 200 | 1.11 |
| France | 150 | 0.83 |
| Saudi Arabia | 150 | 0.83 |
| South Africa | 180 | 1.00 |
| UK | 100 | 0.55 |
| Other Countries | 1,000 | 5.54 |
| Total | 18,065 | 100.00 |

(G Pal and S Srivastava)

Lac Processing in India during 2008-09

On the basis of surveys conducted at different lac processing centers in the country, the total quantity of sticklac processed during 2008-09 was 19,700 tons which also included the imported lac in India. 29 Lac processing units in Chhattisgarh, 16 units in Jharkhand, 6 units in Maharashtra, 2 units in Madhya Pradesh and 138 units in West Bengal were in running condition during the year 2008-09. In processing of lac, West Bengal ranked 1st (39.35 %) followed by Chhattisgarh (33.83 %), Jharkhand (19.55 %), Maharashtra (6.02 %) and Madhya Pradesh (1.25 %). The sticklac processed at different lac processing centers in the country during 2008-09 has been presented in Table given below.

Amount of sticklac processed in India during 2008-09

| State | Districts/Centers | Quantity processed (tons) |
|--------------|--------------------------------|---------------------------|
| Chhattisgarh | Bilaspur (Pendra) | 50 |
| | Dhamtari | 2,800 |
| | Janjgir-Champa (Sakti) | 600 |
| | Kanker | 400 |
| | Korba (Kathgora) | 2,700 |
| | Rajnandgaon | 200 |
| | Sub total | 6,750 |
| Jharkhand | Daltonganj | 200 |
| | Ranchi (Khunti, Bundu) | 3,200 |
| | Saraikela-Kharsawan (Chandil) | 50 |
| | Simdega | 400 |
| | West Singhbhum (Chakradharpur) | 50 |
| | Sub total | 3,900 |
| Maharashtra | Gondia | 1,200 |
| M.P. | Indore | 50 |
| | Bankhedi | 200 |
| | Sub total | 250 |
| West Bengal | Purulia (Balarampur) | 7,500 |
| | Purulia (Jhalda) | 150 |
| | Purulia (Tulin) | 200 |
| | Sub total | 7,850 |
| | Total | 19,700 |

(G Pal)

TRANSFER OF TECHNOLOGY

Training programme conducted on cultivation

| Type of training | No. of participants | No. of batches/camps |
|--|---------------------|----------------------|
| One-week farmers training course on "Scientific cultivation of lac, processing and utilization" | 144 | 4 |
| One-week trainer's training and Educational programme on Lac production, processing and utilization of lac | 251 | 7 |
| On-farm training on lac cultivation | 1543 | 10 |
| Total | 1938 | 21 |

(A K Jaiswal)

Training imparted

Training on Process & Product Development

- ❖ Ten entrepreneurs from Balarampur, West Bengal took training on Bleached lac and Aleuritic acid at the Institute during 28 April to 02 May, 2010

Awareness and exposure programme

| Date of visit | Sponsoring Agency | No. of participants |
|---------------|--------------------------------|---------------------------|
| 5.4.2010 | I.D.P.W.A, Namkum | 15 |
| 7.4.2010 | I.D.P.W.A, Namkum | 40 |
| 12.4.2010 | I.D.P.W.A, Namkum | 15 |
| 15.4.2010 | I.D.P.W.A, Namkum | 18 |
| 15.5.2010 | Firayalal Public School Ranchi | Students-39 Faculty-10 |
| 29.5.2010 | BHU, Varanasi | 6 |
| 24.6.2010 | C.W.D., Torpa | 9 |

Lac Promotion Activities

Lac promotion activity in Yawatmal district of Maharashtra

Sri S.B. Azad, T-4, TOT Division visited Yawatmal district of Maharashtra during 23 June, 2010 to 02 July, 2010 to impart On-farm training on 'Scientific method of lac cultivation'. During the visit, three Tehsils (Arni, Ghatanji and Jormoha) were covered and about 850 lac cultivators attended the programme. The officials from Forest Department including DFO, SDO, ACF, RFO and RO were also present besides the elected members of the District Council. The training programme was appreciated by all

quarters. Local press and media also covered the activity in newspaper for publicity and awareness.



View of programme organized by Forest Department Yawatmal, Maharashtra

DFO, ACF, RFO and RO of Amravati district also appreciated the training programme and requested the Institute to organize similar activity in Amravati district for benefit of the farmers.

Infrastructure development

1. A 25mx10m green net house having pucca beds with motorized irrigation and misting facilities has been constructed under JLDS



Green net house constructed under JLDS in IRF

2. Procurement of Soil moisture meter (TDR) instrument
3. A training hall has been constructed under JLDS at Institute Research Farm.



Training hall constructed under JLDS at IRF



Events

- ❖ Popular lecture by Dr Janardan Jee, Pr. Scientist, ICAR-RCER, Patna on “Managing Innovation and Creativity” on 28 May, 2010.

PUBLICATION AND PUBLICITY

Research Articles/Popular articles

- ❖ Pal G, Bhagat M L and Bhattacharya A 2009. Economics and resource use efficiency of lac cultivation in Jharkhand. *Indian Journal of Forestry*, 32 (1):95-98.
- ❖ Pal G, Jaiswal A K and Bhattacharya A 2010. Estimation of lac production and processing in India, *Environment and Ecology*, 28 (1B): 572-576.
- ❖ Ramani R 2010. Livelihood and ecosystem development through lac culture. In: Tiwari, S C (ed) *Ethnoforestry-the future of Indian forestry*. M/s BSMP Singh, Dehradun. pp 187-201.
- ❖ Singh R K, Baboo Bangali and Singh Balram 2010. Micro-catchment rain water conservation for increased soil moisture level and growth and development of lac host *ber (Ziziphus mauritiana)* under rainfed condition. In: Exploration, development and management of ground water in hard rocks with special reference to Jharkhand state during 25-26 March, 2010 at Ranchi. Abstract. 61 p.
- ❖ Patil P M, Ansari M F and Prasad K M 2010 Effect of urea and thiourea on the performance of water soluble lac varnishes *Paint India*, vol. LX, no.-1, pp.77-82

Field visit

Field demonstration of productive breeds of lac insects under JLDS

- ❖ Seventy kilogram each of three productive breeds (Kulajanga, Nawadih and late variety) have been inoculated at Mangobandh (20 kg each), Chitir (30 kg each) villages in Ranchi district and Chitramu (20 kg each) village of Khunti district. 191 kg broodlac of Kulajanga, 207 kg of Nawadih and 174.5 kg of late variety respectively was harvested at Mangobandh village besides 33 kg of sticklac. Yield was affected due to incessant rain during settlement in the late stock.

NAIP (value chain) (LPD component): A value chain on lac and lac based products for domestic and export markets

- ❖ From 372 kg broodlac supplied, 558 kg broodlac and 159 kg immature lac was harvested from village of Ranchi district and from 600 kg broodlac supplied 343 kg broodlac and 109 kg immature lac was harvested from villages of Khunti district of Jharkhand
- ❖ Twelve ITK information has been collected.
- ❖ Dr A Bhattacharya, Director, Dr B P Singh, P S and Sri D K Singh, TO visited Latehar, Satbarwa, Lali and Chandwa for lac crop monitoring and survey of probable lac growing areas on 14 May, 2010.
- ❖ Dr A Bhattacharya, Director, Dr B P Singh, P S, Dr S Ghosal, Sr Scientist and Sri D K Singh, TO visited Chandrakona Block in West Midnapur District of West Bengal during 23-24 May, 2010 for the inaugural function for lac cultivation on *Flemingia semialata* on a 25 acre land and for monitoring of summer *kusmi* lac crop on *F semialata*. under FLD programme.
- ❖ Mrs Bharati Patel, RA visited Durg, Kawardha, Marwahi and Bilaspur of Chhattisgarh for collection of data and information regarding progress made in the different projects/activity on lac for documentation purpose during 22-27 May, 2010.

PERSONALIA

Seminar/Symposia/Meetings attended

By Director

- ❖ Lac Cell Meeting at Raipur on 08/04/2010 organized by Chhattisgarh Minor Forest Produce (T&D) Cooperative Federation Ltd. and chaired by the Hon'ble Forest Minister.
- ❖ Research Advisory Committee meeting at Central Tasar Research and Training Institute (CTR&TI), Hehal, Ranchi on 21 April, 2010.
- ❖ Brainstorming Meeting at CIPHET, Ludhiana during 1-2 May, 2010.
- ❖ The 2nd State Level Monitoring Committee (SLMC) at Rural Development Department, Govt. of Jharkhand, Dhurwa, Ranchi on 07 May, 2010.
- ❖ The XXIII Extension Education Council Meeting at BAU, Kanke, Ranchi on 13 May, 2010.

- ❖ Meeting with Shri Rahul Kumar Purwar, DC and three NGOs and other officials at Latehar on 14 May, 2010 for discussion on the action plan for promotion of lac cultivation in the district.

By others

- ❖ Dr A Bhattacharya, HOD and Er S K Pandey, Sr Scientist attended the meeting at Purulia on 22 June 2010, for discussion on the prospects of promotion of lac cultivation and lac industry in Purulia district under the Chairmanship of Sri Basudeb Achari, Hon'ble MP and other Govt. officials.
- ❖ Dr R Ramani, Head, Lac Production Division actively participated in the Stakeholder Institutes' Meet related to agrobiodiversity at NBPGR, New Delhi on 07 April, 2010 and made a presentation on "Development of Insect Genetic Resources," with special emphasis on lac insect genetic resource development.
- ❖ Dr R Ramani, Head, Lac Production Division attended the "National Consultation on Agro-biodiversity" held at NAAS Auditorium, New Delhi during 26-27 May, 2010 as expert panel member of agriculturally important insects group and presented his views.
- ❖ Shri R K Singh, Scientist (SS) attended a workshop on "Perspective plan/DPR/MIS for development of rainfed and watershed areas in Jharkhand" on 16 April, 2010 at KGVK-Rukka, Ranchi organized by National Rainfed Area Authority and Jharkhand State Watershed Mission.

He also visited industries and department/laboratories related to packaging during his visit which includes Meijers Distribution Center, Lansing, MI, John Henry Printing Company, West Lansing, MI, New Product Works (Packaging Museum), Ann Arbor, MI, Amcor Rigid Plastics, Manchester, MI and Amway Global, Ada MI among industries and Food Science Department, Horticulture Department, Bio-systems & Agricultural Engineering Department, Nano-Biosensor Laboratory, Auto-ID Research and Testing Center and MSU Recycling Centre & Surplus Store under Michigan State University

He also obtained practical training on use of instruments for packaging material testing.

- ◆ Dr S K Giri, Scientist(Sr Scale) attended a training on non-chemical/non-thermal processing and membrane technology at the Department of Food Science and Human Nutrition, Washington State University, Pullman, USA for a period of 81 days starting from 07 March, 2010 till 26 May, 2010. The training was sponsored by the National Agricultural Innovation Project of the Indian Council of Agricultural Research under the Learning and Capacity Building Programme.

Theory and overview of equipment design related



Dr S K Giri in the laboratory of Washington State University, USA

to non-thermal processing techniques were studied and review of previous and on-going research on the subjects was done during the training. A few experiments were also conducted on high pressure processing and pulsed electric field treatment for processing of apple and orange juice.

Splendid performance

Master Dev Priyo Ghosh S/o Shri Dipak Ghosh, T-7-8 of the Institute secured 96.2% marks in the ICSE, 10th Board Examination- 2010 and ranked 3rd in the Jharkhand State.



Overseas training of Scientists

- ◆ Dr Nirajan Prasad, Senior Scientist attended International Training on Smart/Active Packaging at School of Packaging, Michigan State University, East Lansing, USA from 22 January, 2010 to 20 April, 2010. He was imparted training on Food Packaging, Permeability & Shelf Life and Packaging with Plastics.



Dr N Prasad during training at Michigan State University, USA

Success story of lac cultivation in Narharpur block, Kanker, Chhattisgarh.

Sh. Ashok Kumar Patel S/o Late Sh. Narayan Singh Patel, a farmer (education : 12th standard) of Village Rishewada, Block Narharpur, District Kanker, Chhattisgarh doing lac cultivation since last 25 years but the income he got from this avocation was very less. He has 10 *palas* land 14 *kusum* trees available for lac cultivation. He has 5 acres of irrigated agricultural land in which paddy and vegetables are major crops. Previously he was doing lac cultivation with traditional methods i.e., only inoculation and harvesting of lac, no intermediate crop operational/pest management etc. He got first hand information on scientific method of lac from Forest Department, Kanker and attended a on-farm training conducted by I.I.N.R.G., Ranchi at Kanker, during the year 2006. He started scientific lac cultivation, adopting all improved techniques of lac cultivation i.e. coupe system, pruning of host, selection of quality broodlac, phunki removal, spray of fungicide and insecticide, etc. He is also using improved lac cultivation implements in lac production process. Besides his own lac host trees he has taken 40 *ber* land 2 *kusum* trees on lease and practised scientific lac cultivation. During the year 2007-08, he produced broodlac and sticklac worth Rs. 86,000 from 30 *ber* and 8 *kusum* trees. On average he earns profit of Rs. 1000 per *ber* tree and Rs. 7000 per *kusum* tree. During the year 2008-09 he has taken lac from 30 *ber* and 5 *kusum* trees and produced around 4.5 quintal of broodlac (worth ₹ 40,000) and around 1.6 quintal of sticklac (worth ₹ 10,000).

By adoption of scientific method of lac cultivation his earning from lac has increased tremendously. He is so motivated for lac cultivation and wants to increase the host trees under lac production. He has planted 40 *ber* trees in his field for the purpose of lac cultivation. He sells broodlac with the help of Forest Department, Kanker and sells sticklac directly to the lac processing unit situated at Kanker. With the earning from lac he has purchased a motor cycle, mobile phone and one pair of oxen. He also made barbed fencing around his lac host trees. He has motivated various farmers in his and neighboring villages through information on scientific methods and profitability in lac cultivation. Sh. Patel is now a source of inspiration to other farmers in that area for lac cultivation.

MISCELLANEA

Promotion

- ❖ Sri Mahavir Mahto, SSS promoted to the post of T-1(Electrician) w.e.f. 23 June, 2010.
- ❖ Sri Sukra Ekka, SSS promoted to the post of T-1(Pump Operator) w.e.f. 23 June, 2010.
- ❖ Sri Bandi Lakra, SSS promoted to the post of T-1(Driver) w.e.f. 23 June, 2010.
- ❖ Sri Jhiringa Oraon, SSS promoted to the post of T-1(Tractor Driver) w.e.f. 23 June, 2010.

Appointment

- ❖ Dr S C Sharma joined as Scientist (Farm Machinery & Power) on 24 April, 2010.
- ❖ Sri S C Meena joined as Scientist (Agril.Entomology) on 18 May, 2010.
- ❖ Cosequent upon selection by ASRB, ICAR, New Delhi to the post of Director, Dr R Ramani took office of Director, IINRG, Ranchi on 14 June, 2010(A/N)



Training

Sri Prahlad Singh, A A O participated in a 5 day-training programme on Establishment Rules at ISTM, New Delhi during 10-14 May, 2010.

Retirement

1. Dr K M Prasad, P S on 30 June, 2010
2. Sri R Ravidas, Sr PA on 30 June, 2010.

Quality Evaluation Laboratory

The laboratory carried out 73 tests on 15 samples received from entrepreneurs/business houses/different divisions of the Institute. After renewal of license under ISO:9001-2008 certification of the Q.E. Lab. by BIS, first surveillance audit was completed satisfactorily and auditors expressed satisfaction and recommended to continue the license for quality management system.

(D Ghosh)

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