

**Intellectual Property Management and Transfer /
Commercialization of agricultural technology Scheme
(upscaling of existing component i.e.; Intellectual Property
right (IPR) under ICAR Headquarter Scheme
on management on information services)**

**Progress Report
2009-2010**



**INDIAN COUNCIL OF AGRICULTURAL RESEARCH
ICAR Research Complex for NEH Region
Umroi Road, Umiam, Meghalaya-793 103**



Name of the Scheme: **“Intellectual Property Management and Transfer / Commercialization of agricultural technology Scheme (upscaling of existing component i.e.; Intellectual Property right (IPR) under ICAR Headquarter Scheme on management on information services).”**

Date of sanction: F. No. 14(10)/2007- Ping dated 6th June 2008

Date of Start: 1st August 2009

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Introduction:

According to the ICAR Guidelines for Intellectual Property Management and Technology Transfer/ Commercialization, an effective three-tier mechanism for IP management and technology transfer has been laid down. The scheme shall adhere to a review and monitoring procedure to ensure keeping an up-to-date database of IP assets and other activities/records related to Intellectual Property Management and Technology Transfer/Commercialization in various ICAR institutes.

ATMC (Agro-Technology Management Centre) at the ICAR Headquarter will perform as the apex unit for key facilitation/coordination role and monitoring functions for the implementation of the scheme besides its steering of the policy dimensions of IPRs and Technology Transfer/Commercialization as per provisions.

The ATMC is presently headed by Dr. S. Mauria, ADG (IPR & Policy), ICAR, Krishi Bhawan, Dr. Rajendra Prasad Road, New Delhi 110114 as the Chairman.

ZTMCs (Zonal Technology Management Centres) in the five defined zones and Headquarters will have their regional role of facilitation/coordination/compilation as well as any other role decided for these units by the apex IPR Unit/ATMC/Competent Authority to contribute to the overall objectives of the Scheme

Zone East ZTMC is headed by Dr. K. K. Satapathy, Director NIRJAFT, ICAR, 12, Regent Park, Kolkata- 700040, as the Chairman.

ITMUs (Institute Technology Management Units) are created in the respective institutes headed by the respective Director of the particular institute.

Objective:

The objectives of the Scheme are as follows:

- (i) To set in place an institutional mechanism to protect/manage Intellectual Property (IP) generated within the ICAR system.
- (ii) To implement the incentive system, incorporated in the ICAR guidelines for IP management and technology transfer/commercialization and to encourage greater creativity and rapid innovativeness in the system.
- (iii) To maximize technology transfer by ICAR institutes, and to generate income/recourses through commercialization of IP

Structure:**ITMU Committee under ICAR-RC-NEH, Umiam, Barapani:**

Institute Technology Management Unit is setup with constitution of the following scientists to safeguard the interest of IPR related issues and commercialization of viable technologies developed by this Institute.

Chairman	Director	Dr. S.V.Ngachan
Member	Head of Division / Joint Director	Dr. H. Rehman, JD, Sikkim Centre
Member	Technical Experts (Scientist of the Institute)	Dr. A. Pathnayak, Pr. Scientist & Head Plant Breeding Dr. S.K.Das, Pr. Scientist & Head Fishery
Member	IPR Expert (Scientist from ICAR institutions in the Zone)	Dr. K. Baruah, Director, NRC Yak
Member	Member Secretary, Staff Research Council (SRC)	Dr. N.S.Azad Thakur Pr. Scientist & Head Entomology
Member Secretary	Officer-in charge, ITMU	Dr. A. Mishra Pr. Scientist I/c ATIC and Agril. Ext.

Activities and function of the ITMU:

- 1. Documentation of the Institute IP assets:** It is expected that the ITMUs to always have in ready possession updated information on the IP assets of the Institute(s).
- 2. Advisory role for the scientists/projects:** The advisory role of the ITMUs shall begin from the project formulation stage. The ITMUs shall facilitate the scientists and ensure that a prior art analysis is undertaken before starting a research project.
- 3. IPR protection for technologies developed:** The ITMU shall undertake a comprehensive analysis of the inventions taking at the institute and identify the ones where there is a need to secure the IPR protection.
- 4. Analyses of the commercial potential of IP assets:** ICAR recognizes its public sector character, wherein income generation has not been the highest consideration. Nevertheless, the ITMUs are expected to critically analyse the commercial potential of the inventions in the Institute and take a considered view as to the manner of utilization of their strengths of IP assets or core competence. That is, depending upon the clarity for end-result, a considered view can be developed for utilizing a particular strength either through public or proprietary domain or both.
- 5. Technology Transfer and commercialization:** It is now being increasingly realised that the transfer of technology from the public to the private sector is playing a significant role in new business starts, growth of existing businesses, and new job creation, while resulting in revenue generation for the organisation. The ITMUs shall have to make concerted efforts for transfer of technologies, particularly those where IPR protection has been secured. There can be more than one way in which an Institute may commercialize its new technology. The dominant and traditional way in which technology can be transferred by the institute sector to the private sector is by licensing the invention (exclusive, non-exclusive, partially exclusive, single use, cross license, etc.). The other means could be joint research and development, sponsored research, consultancy or out-right sale of IP (auctions, direct contact) etc. The ITMUs thus, would not only have to identify licensing partners but also develop the skills to negotiate terms/licenses with them. Based on the collective wisdom of the ITMUs case-specific decisions can be taken to place technologies in public domain for open access or free of cost transfer in specific cases where larger public interest is envisaged.
- 6. Reporting and Monitoring:** A comprehensive monitoring system should be developed by the ITMCs out to keep a check on all the various activities, including finances relating to the IP assets of the Institute. The monitoring mechanism could comprise, periodic reports on progress of technical aspects, reports on finances/expenditures and meetings. The ITMU would provide the information to the ZTMC with a copy to ATMC in the format as and when required.

Methodology:

In regard to IPR management, ICAR Umiam, Barapani is at a very initial stage. With the commencement of the scheme a meeting with Dr. S. Saxena, PS, IPR, to have an insight into the main functions under IP management.

After having an understanding of the requirements of the scheme, the process of collection of information on patent, copyright from various sources was started.

Firstly, a format was received for collection of information on Patentable assets from the Council which was circulated on 7th November 2009. Information received was Nil. Thereafter taking this as a starting point developed a data format to collect information and restrained it to IP assets of the Institute and circulated it.

During this period repeated visits were made to various divisions like Animal Nutrition, Animal Production, Animal Health, Fishery, Horticulture, Plant Pathology and Poultry Science and explained to them regarding the information needed under IP assets.

Informative write ups on what intellectual assets included and initial preparatory work to be done by the innovators who wanted to move ahead with patenting their research was prepared and circulated for general awareness to the scientist.

Provided continuous guidance and assistance to a scientist of Horticulture Division relating to the product to be patented.

Visited the various divisions as and when required in order to clarify any queries regarding Intellectual assets or regarding Patent procedure.

Current happening:

Patent ready for filing **“Process for producing a natural colour and flavour Chow-chow tuity fruity”**

Technologies for commercialization

1. **“Instant ginger candy”**

Process to develop candy

2. **“PCR based diagnosis for parasitic infection in Animals”**

PCR based technique has been standardized for identification of species specific gastrointestinal parasites from faecal samples of cattle and goat.

Intellectual assets developed by the institute

Sl. No	Category of IP asset (Technology / Methodological innovation / Germplasm Collection / Products (eg. vaccines, bio-pesticides, equipment, software etc.) / Manuals / Reports.)	Name of P.I. & Co. P.I.	Name of the IP asset	Brief description of the IP asset	New / modification / Innovation / upgradation	Field based or lab oriented	Detail of benefits of the IP asset developed
Animal Science – Fishery, Poultry, AP, AH, AN, Veterinary Parasitology							
1	Technology	Dr. S.K. Das Dr. S.K. Majhi Mr. K.Murmu	Technology for captive breeding of major, minor carp and exotic carp fishes under the agro-climatic condition of mid-hill altitude	Although technologies for captive breeding of the major and minor carps are already well established and many farmers are using the techniques in the plains for mass-scale seed production to stock in ponds and other water bodies, the institute has been successfully reared and captive bred the major and minor carps including exotic where average water temperature is relatively lower ranging between 8 to 23 degrees centigrade.	Upgradation of existing technology	Field based	Fish seeds are being produced every year to cater to the needs of fish farmers of the region for stocking in ponds, tanks, etc., in order to enhance the fish availability.
2	Development of pig variety	Dr. K. M. Bujarburuah	Upgraded pig	Developed pig variety crossing Kashi local pig and Hampshire and 75% and 87.5% Hampshire pig were recommended	Improvement, the developed pig variety has faster	Field oriented	Since the upgraded pig has growth rate and higher feed conversion efficiency, the farmers are

					growth rate, higher feed conversion efficiency and higher economic return/pig/year than existing local pig		getting Rs. 4000-5000 extra income/pig/year than local pig.
3	Technology	Dr. G.Kadirvel Dr. S. Naskar, Dr. Anubrata Das Dr. R.K. Bordoloi Dr. M.H. Khan Dr. A. Kumaresan Dr. Suresh Kumar	Artificial Insemination in pig	Standardized the semen collection, evaluation, preservation and insemination technology in pig	Yes, modified the existing technology particularly in the semen evaluation, preservation and insemination method for local and upgraded cross bred pigs	Field oriented	The farmers are benefited through (a) saving mating cost (800-1000/mating), i. transport cost of female for mating (Rs. 200-300) and long term benefit of superior germplasm, which is higher growth rate, higher feed conversion efficiency and higher economic return/pig/year

							than existing local pig
4	Methodological innovation	Dr. Ashok Kumar Dr. I. Shakuntala	PCR based detection of mesophilic <i>Aeromonas</i> species from different samples	This technique is a multiplex PCR based method to detect <i>Aeromonas</i> specific 16S rRNA gene and to screen the presence of toxin genes (asa 1, aer A & ahh 1) in <i>Aeromonas hydrophila</i> , which is responsible for various important diseases in animals and fish. It is a simple but rapid and useful technique to identify and characterize <i>Aeromonas hydrophila</i> within a very short duration.	Improvement of exiting technology.	lab oriented	This PCR based technology could be used for rapid detection and diagnosis of disease in animals and fish due to mesophilic <i>Aeromonas</i>
5	Methodological innovation	Dr. Ashok Kumar Dr. I. Shakuntala	PCR based detection of <i>Listeria monocytogenes</i> species from different samples	The technique is used to identify and characterize <i>L. monocytogenes</i> from animals, livestock products and fishes. It is a set of two multiplex PCR method used to detect <i>L. monocytogenes</i> specific genes hlyA & iap and regulatory genes plcA & plcB. Detection of <i>L. monocytogenes</i> specific 16S rRNA gene was also improvised	Improvement of exiting technology.	lab oriented	This PCR based technology could be used for rapid detection and diagnosis of disease in animal, livestock product and fishes due to <i>L. monocytogenes</i>
6	Methodological innovation	Dr. I. Shakuntala Dr. Ashok Kumar	PCR based detection of <i>Pasteurella multocida</i> from pig,	This technique is a PCR based method to detect <i>Pasteurella multocida</i> specific KMT 1 gene and typing of <i>P. multocida</i> based	Improvement of exiting technology.	lab oriented	This PCR based technology could be used for rapid detection and diagnosis of diseases in

			cattle and buffalo.	on capsular polysaccharide. The organism is responsible for atrophic rhinitis in pig and Haemorrhage septicaemia in cattle and buffalo. It is a simple but rapid and useful technique to identify and characterize P. multocida within a very short duration.			animals due to Pasteurella multocida
7	Technology	Dr. J.J. Gupta Dr. B.P.S. Yadav Dr. Arun Varma	Feed formula based on damaged grain	High rainfall, humidity and insect infestation causes substantial damage (30-40%) to the production of soybean and maize in field and storage and as such it can not be used for any purpose.	Improvement with simplification for use in field	Field based	ii. Roasted full fat damaged soybean grain can be used as good source of protein and energy feed for livestock. iii. Damaged maize washed with hot water can be incorporated in broiler chicken ration without any adverse effect on growth performance as normal maize.
8	Technology	Dr. J.J. Gupta Dr. B.P.S. Yadav	Feed formula based on non-conventional feed	Some of the underutilized crops of the region were evaluated, documented for use in non-ruminant rations by resource poor farmers so as to bring down the production cost due to acute shortage of feed.	Improvement with simplification for use in field	Field and lab based	i. Job's tears crop is hardy and even grows in degraded and wasteland. The grain can be utilized as energy feed. ii. Buckwheat, an underutilized, non-

							<p>conventional crop can be grown on marginally unproductive acidic lands and can be fed to poultry and rabbit.</p> <p>iii. Underutilized jack bean seed treated with NaHCO₃ (kitchen soda) can be incorporated in poultry ration up to 20% level as protein feed.</p>
9	Technology	Dr. B.P.S. Yadav Dr. J.J. Gupta	Roughage based swine feeding	In order to minimize cost of production and shortage of concentrate feed, green forage were evaluated and recommended for inclusion in swine ration during finisher stage of growth as resource based feeding.	Improvement with up-gradation of existing technology	Field and lab based	<p>i. The green maize and bajra fodder at pre-flowering stage can be a good energy source for adult swine since they chewed thoroughly to meet the energy need up to 25 percent.</p> <p>ii. Fodder radish could form an alternative feed resource for replacing conventional concentrate feed to the extent of 20% in adult swine ration.</p>

10	Technology	Dr. J.J. Gupta Dr. Pramod Singh Dr. P.B. Reddy	Rice polish based feeding technology for pig production	Rice polish based economic feeding technology developed for CB pigs considering feeding practices at farmer's house, constraints and availability of feed resources of the region.	Improvement and up-gradation of existing technology	Field and lab based	<ul style="list-style-type: none"> i. Supplementation of phytase @1 lac unit/100kg feed was sufficient for release of bounded phosphorus from rice polish for utilization by pig and reduced pollution hazard. ii. Good quality rice polish can be included to the level of 50% with phytase in CB pig ration during grower stage of growth. iii. Rice polish can be included up to 70% without phytase during finisher stage of growth for economic production.
11	Technology	Dr. J.J. Gupta Dr. P.B. Reddy Dr. R.K. Bordoloi	Sweet potato tuber based feeding technology for pig production	Resource based balanced feeding technology for economic pig production considering production potential and farming system of the region.	Improvement and up-gradation of existing technology	Field and lab based	<ul style="list-style-type: none"> i. Boiling of sweet potato tuber improved nutritive value by destroying toxic factor trypsin. ii. Boiled sweet potato tuber was good substitute of energy feed for swine ration.

							iii. Inclusion of sweet potato tuber reduces the use of concentrate feed up to 60% by resource poor farmers.
12	Technology	Dr. J.J. Gupta Dr. B.P.S. Yadav Dr. P.B. Reddy	Fodder production under rain-fed, hot and humid subtropical condition	Improved perennial forages introduced in the region for more biomass yield with better nutritive value since native pastures are poor in nutrients and biomass yield.	Up-gradation and expansion of existing technology	Field and lab based	<ul style="list-style-type: none"> i. The newly introduced forages are rich in nutrients with almost double in biomass yield in comparison to local native pastures. ii. Forages are available round the year. iii. Annual legume soybean crop provide excellent quality of fodder by harvesting at 65-70 days duration and at last grain also. iv. It also checks soil erosion with ecological benefits through C-sequestration.
13	Technology	Dr. P.B. Reddy Dr. B.P.S. Yadav Dr. J.J. Gupta	Dairy Farming in NE India	Performance of crossbred cows and calves under different land use system in NE region based on available resources.	Up-gradation and validation of existing technology	Field based	<ul style="list-style-type: none"> i. The climatic conditions of the NEH region are favorable for rearing crossbred high yielding dairy cattle for livelihood

							<p>improvement of the farmers with sustainability of farming system.</p> <p>ii. Feeding strategy was standardized for optimal growth in crossbred calves by strategic supplementation of concentrate feed @ 1.75 – 2.25% of body weight.</p>
14	Technology	Dr. J.J. Gupta Dr. Anubrata Das Dr. P.B. Reddy Dr. K.M. Bujarbaruah	Roughage based feeding technology for rabbit production	Organic legume forage based feeding technology developed for broiler rabbit production due to increasing awareness of hazardous effect of inorganically produced food for human health.	<p>i. Innovation (soybean fodder works as a maintenance ration for adult rabbit)</p> <p>ii. Up-gradation of existing technology</p>	Field and lab based	<p>i. Rabbits could utilize rice bean and soybean fodder more efficiently and up to 60% of their total DM intake can be met through forages.</p> <p>ii. More production of NH₃-N on soybean fodder and could help rabbits to get more net energy and protein to meet maintenance need. Organic broiler meat can be produced from organic forage</p>

							feeding.
15	Software	Dr. S. Bandyopadhyay	Computer Programme for Protozoan Parasitic Diseases	This is a window based multimedia software containing the detail description about morphology, lifecycle, pathogenesis, diagnosis and treatment of different protozoan parasites affecting domestic animals. Different immunological techniques has also been incorporated in detail with animation effect. Although the main aim of the programme is to give detail information on protozoan parasites, this programme is also having different types of databases for cestode, trematode, nematode and protozoa. This database is useful for easy retrieving of different parasites based on host, organ, location etc. Any user can easily run this programme in a computer having window 9x as operating system, minimum 16 MB RAM and CD ROM drive.	Innovation		This programme is helpful for the workers, academician and also for students engaged in the field of Parasitology. This is also helpful for the technician engaged in the Parasitology laboratory.
16	Methodological innovation	Dr. S. Bandyopadhyay	PCR based diagnosis for parasitic infection	PCR based technique has been standardized for identification of species specific gastrointestinal	Improvement	Field based	Diagnosis of gastrointestinal parasitic infection by molecular

			in Animals	parasites from faecal samples of cattle and goat.			method
	Technology	Dr. S. Bandyopadhyay Dr. R.Laha Dr.Meena Das	DOT-ELISA based diagnostic kit for detection of antibody against <i>Oesophagostomum sp.</i> And <i>Bunostomum sp.</i>	DOT-ELISA based diagnostic kit for detection of antibody against <i>Oesophagostomum sp.</i> And <i>Bunostomum sp.</i>	New	Field based	Zero prevalence of <i>Oesophagostomum sp.</i> And <i>Bunostomum sp.</i> infection.
17	Technology	Dr Nazrul Haque Dr (Mrs) Saroj Toppo	Nil	Compacted Feed Block machine	An Innovation and improvement over existing technology. Portable, easy to operate and economically viable and suitable for small and marginal farmers.	Field based	<ol style="list-style-type: none"> 1. Feed block reduces feed loss as residues up to 90 to 100%. 2. It helps to supplement deficient nutrients to animals in right proportion 3. It increases efficiency of utilization of nutrients 4. It reduces scarcity of feeds during winter. 5. It is user-friendly as the cost of the machine is cheap and suitable for small and

							marginal farmers.
18	Technology	Dr (Mrs) Saroj Toppo Dr Nazrul Haque	Nil	User-friendly Small Scale Silage Making	An Innovation and improvement over existing technology. No permanent structure is required like silo pit Easy to prepare as per requirement of the house holds and easy to store and no environmental pollution. Suitable for small and marginal farmers.	Field based	<ul style="list-style-type: none"> • As haymaking is difficult in North Eastern Hilly Region, silage making is an alternate method to preserve the excess forage biomass available, for use in the lean season (winter). • Ensure supply of feed during lean season. • Ensure a consistent level of production throughout the year. • Green forage can be stored for a long period (12-18 months). • Thick stems of mature forages become soft, more palatable and better utilized. • Acids produced during ensiling are easily utilized as a source of

							<p>energy by the animals.</p> <ul style="list-style-type: none"> • Many undesirable worms and their eggs present in the fresh crop are eliminated after ensiling.
19	Database	Dr. H. Rahman	Epidemiological data on gastrointestinal parasites	Epidemiological data on the prevalence of gastrointestinal parasites in the livestock of Sikkim. Overall prevalence, agroclimatic zone wise, animal wise, monthly and seasonal prevalence of different gastrointestinal parasites in livestock of Sikkim. and economic impact of GI-Parasitism on milk production.	Nil	Lab and field oriented	Helps in the development of Parasitic disease forecasting model and bioclimatograph.
20	Bulletin	Dr. H. Rahman	Gastrointestinal parasitism in Livestock of Sikkim and their management	Bulletin covers the topics related to epidemiology and management programme which will be of great help in preparing bio-climatographs and disease forecasting models for different gastrointestinal nematodes in cattle, goats and yaks of various agro-climatic zones of Sikkim	Nil	Lab and field oriented	It is helpful as a reference literature to the field veterinarians, scientists working in the field of parasitology and animal husbandry workers for providing better veterinary aid services to the livestock breeders.
21	Souvenir	Dr. H. Rahman	National Symposium on Trans-boundary	Souvenir deals with the potent zoonotic diseases and their management, however , it also	Improvement	Field based	Souvenir will help in managing zoonotic diseases and in making

			zoonotic diseases: Challenges and Strategies	highlights the recent advances in the field of veterinary public health			perspective plan for disease management
22	Souvenir	Dr. H. Rahman	Regional Agriculture Fair, 2008	Souvenir deals with the status and strategies for improvement on agriculture and allied sector in the region.	Improvement	Field based	Souvenir is helpful in improving crop production and emphasizing sustainable integrated farming system in the region.
23	Germplasm collection	Dr. Suresh Malik	Poultry variety (Tripura Black)	The germplasm was collected from the remote villages of Tripura. The germplasm was regenerated at the farm. The birds showing phenotypically uniform traits were selected and regenerated. Later on, the female birds were selected on the basis of physical appearance and higher egg production upto 40 weeks of age. The males were selected on the basis of higher body weight and shank length. The pedigree stock of the germplasm has been established at the farm. Two reciprocal crosses were generated using this germplasm with female line of Gramapriya.	Improvement and conservation of endangered germplasm. At least 25 % higher body weight and 50% more egg production compared to local birds	Field based	First, the endangered germplasm is conserved at the farm. The germplasm has lower mortality as compared to improved stock. The germplasm is better for rural poultry production and is being used for the development of new variety.
NRM- Soil Sc, Agronomy, Agril Engg.							

24	Technology	Dr. G.C. Munda Dr. Anup Das Dr. D.P. Patel	Double cropping of rice in mid-altitude	Transplanting, rationing, etc.	Innovation-cum-improvement	Field based	Possible to double rice production in mid-altitude by two crops of rice in a year.
25		Dr. A.S.Panwar	Raised and sunken bed technology	Raised:sunken bed of 40:60 ratio with 40 cm height	Improvement of existing technology	Field based	Cropping intensification and diversification.
26		Dr. D.P. Patel Dr. Anup Das Dr. G.C. Munda	Organic farming in French bean	Organic package of practices	Improvement	Field based	Package of practices for organic production of French bean
27		Dr. Anup Das Dr. D.P. Patel Dr. P. Baiswar Dr. G.C. Munda	Composting of local biomass (plant)	Weed biomass, crop residue, enrichment, composting.	Improvement	Field based	Improves rice productivity and soil health
28	Technology	Dr. Anup Das Dr. P.K.Ghosh Dr. R. Saha Dr. V.K. Mishra	Micro rain water harvesting (Jalkund)	Pit (5x4x1m), polythene/silpauline, cushioning	Improvement and upgradation	Field based	Can harvest about 30,000 lit water in hill top from rain
29	Germplasm collection	Dr. M.Datta Dr. N.P. Singh	<i>Jatropha curcas</i>	Nil	The material is collected from different places		A variability in the oil content and productivity in the jatropha fruit
Horticulture							
30	Technology	Dr. R.K. Yadav Dr. D.S. Yadav Dr. B.C. Deka Dr. S.K. Sanwal Dr. A.K. Jha	Tomato variety: Megha Tomato-1	Nil	Improvement in the cultivars	Field and lab based	The developed variety is tolerant to bacterial wilt under field condition.

		Dr. V.K. Verma					
31	Technology	Dr. R.K. Yadav Dr. D.S. Yadav Dr. B.C. Deka Dr. S.K. Sanwal Dr. A.K. Jha Dr. V.K. Verma	Tomato variety: Megha Tomato-2	Nil	Improvement in the cultivars	Field and lab based	The developed variety having high yield and resistant to bacterial wilt and high in TSS
32	Technology	Dr. R.K. Yadav Dr. D.S. Yadav Dr. B.C. Deka Dr. S.K. Sanwal Dr. A.K. Jha Dr. V.K. Verma	Tomato variety: Megha Tomato-10	Nil	Improvement in the cultivars	Field and lab based	The developed variety is tolerant to bacterial wilt and is suitable for protected cultivation.
33	Technology	Dr. R.K. Yadav Dr. D.S. Yadav Dr. B.C. Deka Dr. S.K. Sanwal Dr. A.K. Jha Dr. V.K. Verma	Brinjal variety: Megha Brinjal-1 (RCMBL-1)	Nil	Improvement in the cultivars	Field and lab based	The developed variety having high yield with resistance to bacterial wilt.
34	Technology	Dr. R.K. Yadav Dr. D.S. Yadav Dr. B.C. Deka Dr. S.K. Sanwal Dr. A.K. Jha Dr. V.K. Verma	Brinjal variety: Megha Brinjal-2 (RCMBL-2)	Nil	Improvement in the cultivars	Field and lab based	The developed variety having high yield (350q/ha) with tolerant to bacterial wilt.

35	Technology	Dr. R.K. Yadav Dr. D.S. Yadav Dr. B.C. Deka Dr. S.K. Sanwal Dr. A.K. Jha Dr. V.K. Verma	Brinjal variety: Megha Brinjal-3 (RCMBL-3)	Nil	Improvement in the cultivars	Field and lab based	The developed variety having high yield (400q/ha) with moderately tolerant to wilt.
36	Technology	Dr. S.K. Sanwal Dr. D.S. Yadav Dr. B.C. Deka Dr. R.K. Yadav Dr. A.K. Jha Dr. V.K. Verma	Dolichos bean variety: RCDDL-10	Nil	Improvement in the cultivars	Field and lab based	The developed variety is bushy in growth habit and photo-insensitive in nature. First harvesting 75 days after sowing.
37	Technology	Dr. R.K. Yadav Dr. D.S. Yadav Dr. B.C. Deka Dr. S.K. Sanwal Dr. A.K. Jha Dr. V.K. Verma	Colocasia variety: ML-1	Nil	Improvement in the cultivars	Field and lab based	Yield 250-275 q/ha and tolerant to leaf blight.
38	Technology	Dr. R.K. Yadav Dr. D.S. Yadav Dr. B.C. Deka Dr. S.K. Sanwal Dr. A.K. Jha Dr. V.K. Verma	Colocasia variety: ML-9	Nil	Improvement in the cultivars	Field and lab based	Yield 200-220 q/ha and tolerant to leaf blight.
39	Technology	Dr. Ram Chandra	Turmeric variety: Megha Turmeric-1	Nil	Improvement in the cultivars and	Field and lab based	Tolerant to leaf blotch and leaf spot. Average yield: 27-30 t/ha.

		Dr. D.S. Yadav Dr. A.K. Singh			high yielding over parental lines.		Curcumin content 6.8 %
40	Technology	Dr. R.K. Patel Dr. A.K. Dubey Dr. D.S. Yadav Dr. Akath Singh	Softwood grafting in Khasi mandarin	Softwood grafting is used as an alternate method for raising the quality planting material of Khasi mandarin. Softwood grafting should be done in July-August on 60-90 days old rootstock. It gave >80 % graft success depending upon the rootstocks.	Upgradation of propagation technique in Khasi mandarin for better success and quick plant multiplication .	Field based	It is suitable for multiplication of true to the type planting material of Khasi mandarin.
41	Technology	Dr. R.K. Patel Dr. D.S. Yadav Dr. Bidyut C. Deka Dr. Akath Singh Dr. K.D. Babu	Guava cv. RCG-1	Seedling progeny selection from local guava. Plant growth semi-erect type. Small to medium size fruit (70-100 g), yellow colour at maturity, pulp white, TSS (8.8-9.5%). Suitable for fresh consumption.	Improvement over parental line with respect to TSS and fruit size.	Field based	It is suitable for cultivation of under subtropics of mid-hills of Meghalaya.
42	Technology	Dr. R.K. Patel Dr. D.S. Yadav Dr. Bidyut C. Deka Dr. Akath Singh Dr. K.D. Babu	Guava cv. RCG-3	Seedling progeny selection from local guava. Plant growth semi-erect type. Medium size fruit (90-110 g), brownish yellow colour at maturity, pulp red, TSS (9.0-9.6%). Suitable for processing purpose.	Improvement over parental line with respect to processing quality and yield.	Field based	It is suitable for cultivation of under subtropics of mid-hills of Meghalaya.
43	Technology	Dr. Ram Chandra	Guava cv. RCGH-1	Hybrid of sour type X Red fleshed local. Plant growth upright erect with dark green	Improvement in yield and quality.	Field based	It is suitable for cultivation under subtropics of mid-hills of

		Dr. R.K. Patel Dr. Bidyut C. Deka Dr. K.D. Babu Dr. Akath Singh		broad leaves. Yield 35 kg/tree, fruit medium (125-160 g) size, greenish yellow in colour with red dots at ripening, pulp white, sweet taste, less seed, TSS (11-11.2%), acidity (0.39-0.40%) and ascorbic acid content (240-255mg). Fruiting one week earlier than other guava variety. Suitable for fresh consumption.			Meghalaya.
44	Technology	Dr. Ram Chandra Dr. R.K. Patel Dr. Bidyut C. Deka Dr. K.D. Babu Dr. Akath Singh	Guava cv. RCGH-4	Hybrid of Red fleshed X Allahabad Safeda. Plant growth semi spreading type. Yield 28.5 kg/tree, fruit medium to big size (170-200 g) , greenish yellow colour at maturity,, pulp red, sweet taste, TSS (10-10.4%), acidity (0.45-0.58%) and ascorbic acid content (200-215mg), suitable for processing purpose.	Improvement in terms of processing quality.	Field based	It is suitable for cultivation under sub-tropics of mid-hills of Meghalaya.
45	Technology	Dr. Ram Chandra Dr. R.K. Patel Dr. Bidyut C. Deka Dr. K.D. Babu Dr. Akath Singh	Guava cv. RCGH-7	Hybrid of Lucknow-49 X Pear shaped guava. Plant growth erect. Yield 30.5 kg/tree, medium size fruit (115-150 g) , light green in colour at maturity, pulp white, sweet taste, less seed content, TSS (11.4-11.8%), acidity (0.31-0.35%) and ascorbic acid content (210-225mg), suitable for fresh	Improvement over parental line with respect to yield and quality.	Field based	It is suitable for cultivation under sub-tropics of mid-hills of Meghalaya.

				consumption.			
46	Technology	Dr. Ram Chandra Dr. R.K. Patel Dr. Bidyut C. Deka Dr. K.D. Babu Dr. Akath Singh	Guava cv. RCG-11	Seedling progeny selection from Meghalaya. Plant growth semi-spreading type. Yield 32.5 kg/tree, medium size fruit (110-145 g) size, light green colour at maturity, pulp white, TSS (11.2-11.4%), acidity (0.36%) and ascorbic acid content (205-215mg). Suitable for fresh consumption.	Improvement over existing cultivars in terms of yield and quality.	Field based	It is suitable for cultivation under subtropics of mid-hills of Meghalaya.
47	Technology	Dr. R.K. Patel Dr. Akath Singh Dr. Bidyut C. Deka Dr. K.D. Babu	Guava cv. RCGS-15	Seedling progeny selection from Meghalaya. Plant growth semi-spreading type. Medium size fruit (100-1125 g) size, light green colour at maturity and greenish yellow at ripe stage, pulp white, sweet taste, TSS (10.0-10.6%). Suitable for fresh consumption.	Improvement over existing cultivars.	Field based	It is suitable for cultivation of under subtropics of mid-hills of Meghalaya.
48	Technology	Dr. S.K. Sanwal Dr. D.S. Yadav Dr. B.C. Deka Dr. R.K. Yadav Dr. A.K. Jha Dr. V.K. Verma	French bean cv. RCMFB-1 (Sel-43)	Nil	Improvement, high yielding over the locals.	Field based	Suitable for planting as spring-summer crops as well as autumn-winter crops.
49	Technology	Dr. Amit Nath Dr. Bidyut C.	Chow-chow tuty fruity	Nil	Innovation	Lab based	Entrepreneurs may be established.

		Deka					
50	Technology	Dr. Amit Nath Dr. Bidyut C. Deka	Instant ginger candy	Nil	Innovation	Lab based	Entrepreneurs may be established.
51	Technology	Dr. Rajeev Kumar Dr. Bidyut C. Deka Dr. L.C. De	Round year cultivation of Gerbera under protected condition	Nil	Improvement over the traditional method of Gerbera cultivation	Field based	Entrepreneurs may be established and farmers will be benefited by the off-season production.
52	Methodology	Dr. Kundan Kishore	Production of enriched vermicompost	Vermicompost generally contains N 1.0%, P 0.4% and K 0.8%. Enriching of vermicompost provides high amount of nutrients (N2%, P.8%K1.5%) to plants. Addition of Azospirillum +PSB+PMB to vermibed increased the nutrient content	Improvement in existing technology	Field based	Enriched compost reduces the rate of application (6-8t/ha) and also make nutrients available in high amount to crops
53	Germplasm	Dr. Kundan Kishore	Citrus germplasm	Centre has 10 varieties of mandarin (Dancy, king, Thorny, Fox, Fortune, Malvasio, Nova, Kinnow, Murcot, Daisy), 8 varieties of sweet orange (Lance Late, Navelina, Bakes Sweet, Parson Brown, Pineapple, Naval, New Hall, Paramato) 2 varieties of lemon (Villa France, Verna,), 3 varieties of	Collection from Australia	Field based	Evaluation of different citrus germplasm may give better mandarin varieties, sweet orange varieties, lemon varieties and mandarin hybrids. That will be helpful in improving the citrus industry in the state.

				grapefruit and 5 different root stocks			
54	Germplasm	Dr. H. Rahman	Ginger germplasm	Centre has more than 100 germplasm of ginger collected from all the eight states of north east.	Collection	Field based	Evaluation and molecular characterization of different ginger germplasm may give better ginger varieties and will also helps in patenting the material under geographical indicator.
55	Germplasm	Dr. Ashok Kumar	Chilli (Dalle) germplasm	More than 20 germplasm of local chilli collected from different parts of Sikkim.	Collection	Field based	Evaluation of different chili germplasm may give better chili varieties
56	Database	Dr. Kundan Kishore	Prevalence of citrus tristeza virus in Sikkim	The major mandarin growing belts of Sikkim were infected with CTV and except east district, the CTV incidence in north, south and west districts were more than 70%. The lowest incidence was recorded in east district.	Improvement	Field based	This will help in screening the disease free mother plant for production of quality planting materials.
57	Bulletin	Dr. Kundan Kishore	Insect pests and diseases of citrus and their management	Bulletin covers all aspects of insect pests and disease management through organic means that will help in producing quality planting materials of citrus and proper citrus orchard management.	Improvement	Field based	The bulletin will help in producing quality planting materials of citrus and proper orchard management that in turn will increase the production and productivity of plants.

58	Bulletin	Dr. Kundan Kishore	Vegetables and Spices: Production Technology	Bulletin covers all aspects of production technology of major vegetables and spices of the state.	Improvement	Field based	The bulletin will help in enhancing production of vegetables and spices and also cultivation of high value vegetables for more income generation.
59	Bulletin	Dr. Ashok Kumar	Nursery Management of Sikkim mandarin	Bulletin covers all aspects of production of quality planting materials of citrus	Improvement	Field based	Bulletin helps in producing quality plants of citrus that will improve the production of citrus in the state.
Plant Protection – Pathology, Entomology							
60	Methodological innovation	Dr. N.S. Azad Thakur Dr. Kanchan Saikia	Improvisation of crab trap for gundhi bug	Dead and decayed crab was placed inside a plastic funnel trap to trap the rice gundhi bug at flowering stage of rice	Improvement of technology	Field based	Organic management of gundhi bug. Sustainable agriculture
61	Technology	Dr. Kanchan Saikia Dr. N.S. Azad Thakur	Artificial diet for citrus trunk borer grub (<i>Anoplophora versteegi</i>)	Artificial diet containing citrus plant saw dust and agar-agar was used to rear citrus trunk borer grub (<i>Anoplophora versteegi</i>) in laboratory conditions. The trunk borer grub survived upto third instar on this diet	Innovation	Lab oriented	To study the biology and development of management of citrus trunk borer
62	Collection	Dr. Pankaj Baiswar Dr. Satish	Nil	Herbarium specimens of diseased plant material	No	Lab oriented	True identity of many pathogens has been revealed which is

		Chandra Dr. S. V. Ngachan					important for taking decisions related to sanitary and phytosanitary measures and also for management and screening trials against many diseases
63	Germplasm collection	Dr. Subrata Biswas	Germplasm Brinjal (Singnath)	Resistant to bacterial wilt, plant erect, can be grown throughout the year under Tripura condition, fruit size medium, shape slender, straight, pink on maturation greenish	Improvement on the existing technology, highly resistant (almost immune) to bacterial wilt	Field based	The genotype can be used in breeding works for the development of high yielding bacterial wilt resistant cultivars.
64	Germplasm collection	Dr. Subrata Biswas	Tomato germplasm	Different genotypes of tomato are maintained as seeds collecting every year from experimental field	Upgradation of the existing technology, bacterial wilt resistant 100% in case BT-1 and leaf curl resistant genotype (s) will be identified	Field based	Bacterial wilt resistant genotype (BT-1) and leaf curl disease resistant genotype (yet to identify) will be used by farmers/scientists.
65	Germplasm collection	Dr. Subrata Biswas	Mushroom culture	Mushroom culture of <i>Pleurotus</i> spp., <i>Volvariella volvacea</i> , <i>Calocybe indica</i> , <i>Macrolepiota procera</i>	Not accounted	Lab oriented	Different types of mushrooms can be cultivated during different seasons.

66	Reports	Dr. Subrata Biswas	Technology bulletin	Mushroom Production technologies of <i>Pleurotus</i> spp., <i>Volvariella volvacea</i> , <i>Calocybe indica</i> and <i>Macrolepiota procera</i> along with post harvest technologies of mushrooms	Nil	Lab oriented	Different types of mushrooms can be cultivated during different seasons.
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Proceedings:

During the period 2009-2010, three major meeting were conducted to ensure the smooth functioning of the IPR related activities.

First Meeting

The purpose of the first meeting was to get acquainted with the various issues related to Intellectual Property Rights and further to understand the role of the ITMU in the process of facilitating the management of technologies developed in the Institute.

Proceedings of the meeting held on 29th August held in the Agril. Extension Division

A meeting was convened to discuss the IP related issues at the Agril Extension Division. The meeting was attended by Dr. S. Saxena, PS, IPR, Dr. A. Mishra, PS and HOD Agril Extension, ATIC.

The main issue discussed during the meeting was what would be the main functions under IP management. Throwing light on the subject Dr. Saxena briefed on the broad guidelines laid down by ICAR in relation to IP management in the Institute.

The following points were dealt with during the meeting

1. To have a well documented information on the IP assets of the Institute whether they are patentable or not.
2. To provide information to the scientists regarding the IP related issues pertaining to their respective ongoing project.
3. To make a comprehensive analysis of the inventions taking in the institute and to identify the ones where there is a need to secure the IPR Protection.
4. How to develop a comprehensive monitoring system and to keep a check on all the various activities, including finances relating to the IP assets of the Institute.
5. The manner in order to assist the institute on undertaking professional services in the form of consultancy, contract research or contract services by creating awareness on core competence and marketing of Institute expertise for outside agencies.
6. Further how to critically analyse the commercial potential of the inventions in the institute and take a considered view as to the manner of utilization of their strength of IP assets or core competence.

Further during the meeting the plan of future course of action was also discussed. Since ICAR Umiam, Barapani is at the very initial stage in the process of implementing the IPR management, therefore at present the main function is to collect relevant information pertaining to IP assets of the Institute and document it. It was decided to collect this information division / scientist wise.

While collecting information certain areas should be kept in mind like technology developed, the skill involved and the name of equipments developed as well as their technological know-how. At the same time information relating to copyright materials like publication, research papers etc. will also be collected and documented.

Further more information on the ongoing projects will be collected and analysed so as to inform the scientists of the various possibilities of patenting it.

The meeting concluded with a vote of thanks by Dr. A.Mishra for providing valuable information and guidance.

Second Meeting

The purpose of the second meeting was to review the action taken on the issues discussed the first meeting and to plan the future course of action.

Agenda

1. To Facilitate patent procedure and develop patentable technology
2. To Facilitate the commercialization of those technology
3. Development of IP assets data base.
4. Recommendation for Books and Journals

Proceedings of the meeting held on 25th January 2010 in the Director's Chamber

A meeting was held on 25th January 2010 in the Director's Chamber to review the progress under the project "Intellectual Property Rights" as well as to discuss the various aspects of Intellectual Property Rights relating to this Institute. The meeting was chaired by the Director, Dr. S.V. Ngachan. Others present during the meeting were Dr. K. Baruah, Director, NRC Yak, Dr. N. S. Azad Thakur, Pr. Scientist & Head (Ento.), Dr. A. Pattanayak, Pr. Scientist & Head (Pl. Br.), Dr. S. K. Das, Pr. Scientist, Fishery and Dr. A. Mishra, Pr. Scientist, I/c ATIC& Nodal Officer ITMU.

At the very onset, a review of the follow up action taken on the various points discuss in the previous meeting was done by the Committee Members.

Dr. S.V.Ngachan stressed on the need to create awareness among the scientist to have their technologies patented. He further said that even if the technologies are not patentable it must be registered so that the rights are duly protected. He further added that law, legal aspects as well as the patent format and procedure of filing patents relating to the respective projects must be circulated to the scientists.

Emphasizing on the need to have a documented data base of IP assets of the Institute, Dr. S.V.Ngachan said that it is regretted that the information from the Regional Centres/ Divisions on IP assets have not yet been received even after many reminders. Therefore he urged them to expedite and provide the information relating to their respective centers as soon as possible. Dr. Ngachan further said that it is time we go ahead registering the technologies as soon as possible so that in the delay we don not loose the valuable information. Moreover information of the historical aspects needs also to be collected as this information will be of great use during the patent process. He further said that once the collection of information has been done, proper screening has to be done to identify those that need to be secured by a patent right.

Dr. S.V.Ngachan, said that we should facilitate the farmers in collecting the data and help them in going ahead in patenting their products.

Dr. A. Pathnayak stressed on the need to identify in every IP assets, one significant point or characterization which will make the probability of it being patentable more stronger as now a day many researchers are done one the same lines in different places. Therefore its uniqueness will be a very important point to be noted. He further stated that DUS testing data must be collected in order to make the information more substantial.

The Director thanked the members and expressed his satisfaction with the progress of the IP Cell.

Third meeting

The third meeting was held with the main aim to scrutinize the final application for patent to be filed from this institute besides discussing certain issues relating to the data collected on patentable technologies.

Agenda

1. Approval of the application for Patent by the committee and forward it to ZTMC for further necessary action.
2. Revision of the RPF I format to include the information related to Patent for approved projects.
3. Categorizing the data collected into Protected and Non-protected and further under both which can be commercialize/non commercialize

Proceedings of the meeting held on 21st April 2010 in ATIC Division

A meeting was convened on 21st April 2010 in ATIC Division with the main agenda to approve the final application for patent by the Committee members and forward it to ZTMC for further necessary action.

The meeting was attended by the following members

- Director, Dr. S.V. Ngachan, Director
- Dr. K. Baruah, Director, NRC Yak,
- Dr. B.P.Bhatt, JD Nagaland Centre,
- Dr. A. Pattanayak, Pr. Scientist & Head (Plant Breeding),
- Dr. S. K. Das, Pr. Scientist & Head, Fishery,
- Dr. B.C. Deka, Pr. Scientist & Head, Horticulture,
- Dr. Amit Nath, Sr. Scientist Horticulture,
- Dr. A. Mishra, Pr. Scientist, I/c ATIC& Nodal Officer ITMU.

At the very onset, a review of the follow up action taken on the various points discussed in the previous meeting was done by the Committee Members. A scrutiny of the information collected on Intellectual assets collected from the different divisions/centres was done and some modifications were suggested to be incorporated. Furthermore valuable suggestions on the collection procedure to be followed were also given during the discussion. More information on some crops and plant varieties like

Ricebean, King chilly, citrus was suggested to be collected so that significant records can be maintained.

Laying stress on the fact that North East being a bio rich region, the Chariman, Dr. S.V.Ngachan suggested that in regard to the indigenous varieties of papaya, mango, litchi, ginger more comprehensive research needs to be done in this area.

The Chariman, Dr. S.V. Ngachan said that information on the status of Patent filed by the scientist of Parasitology Division should be collected either from the division or from the scientist concerned so that the current standing on the issue can be confirmed.

With regard to books/ bulletins published it was again asserted that ISBN numbers must be obtained for books published. For this purpose a copy of the books/bulletins should be sent to the concerned authorities.

Since the accession numbers for all plants germplasm are not available, it was emphasized that the Accession nos. for all germplams must be obtained from NBPGR and proper records should be maintained.

It was also suggested to identify the best varieties and to protect it by registration or patent so that valuable information on these are not misplaced. Further it was also felt that certain system at the institutional level has to be implemented to protect the information on ornamental fishes.

Dr. A Pattanayak suggested that when a persons name is mentioned in Co-PI, there should be a declaration from the Division so that scientist who have put in their hard work, their names are duly mentioned and false credit can be avoided.

The next agenda during the meeting was revision of the RPF I format to include the information relating to patent for the approved projects. This was approved in the meeting. Further, with regard to non receipt of information from the centres, it was decided to send a reminder once again.

The activities proposed for the year 2010 was also placed before the committee members which included

1. Organizing an awareness programme for the Joint Directors and Scientists of the Institute regarding Intellectual Property Rights and Patent procedure.
2. Facilitate the scientist as and when required.
3. Identify more IP assets and go ahead with patenting them
4. Collecting modified RPF 1.
5. Information from different Division / Regional Centre on updated technology for patent / commercialization.

The meeting ended with the Directors approval to send the product for patenting, which was duly sealed and handed over to Dr. Anupam Mishra, Officer-in-charge ITMU to be taken to ZTMC.

Budget utilization for the year 2009-10:

S.No	Component	Sanction 2009-10 (Rs. in lakh)	Fund Released (2009-10) (Rs. in lakh)	Actual Expenditure Incurred upto 31st March 2010 (Rs. in lakh)
	Recurring			
1	Pay & allowances OTA			
2	T.A.	0.50		0.25
3	Contractual staff cost	1.88		1.46,090
4	Operation cost	1.00		0.20
5	Workshop			
6	National Training			
7	International Training			
8	Total	3.38		
	Non-Recurring			
1	Equipments	1.00		0.50
2	Works			
3	Furniture & Fixture	0.25		0.25
4	Library Books	1.00		0.00
	Total	5.63	5.63	2.6609