COLLEGE OF POST GRADUATE STUDIES IN AGRICULTURAL SCIENCES, BARAPANI, MEGHALAYA

M.Sc Theses

NATURAL RESOURCE MANAGEMENT (NRM)					
S. No.	Title of the thesis	Name of the student	Major subject	Year of completion	Outcome (2-3 lines)
1. Rice					
Discipline: Agronomy					
Classification/category: Agrotechniques					
1	Evaluation of rice cultivars under various planting geometry in mid altitude lowland condition of Meghalaya	Mr. K. Lenin Singh	Agronomy	2013	➢ The hybrid cultivar Arize 6444 gave significantly higher yield over the recommended inbred Shahsarang1 and local cultivar Mynri at all the planting geometries. ➢ For getting maximum net return, Arize 6444 should be transplanted at 20 cm x 20 cm planting geometry.
2	Agronomic evaluation of rice cultivars under delay transplanting in the mid hills of Meghalaya	L.Platini Singh	Agronomy	2018	➢ Under delayed transplanting, rice cultivar CAU R3 gave significantly high yield and economic return on all three transplanting dates ➢ CAU R1 could be used as an alternative only upto 5th August transplanting
2. Maize					
3	Performance of quality protein maize under integrated nutrient management practices	Mr. Samborlang K. Waniang	Agronomy	2012	➢ Utilizing the inter space in between the maize rows for green manuring with cowpea helped in improving yield and soil fertility. ➢ Application of 75% RDF in presence of 5 t FYM ha^{-1} found to increase yield and economics of quality protein maize under mid hill altitudes of Meghalaya.
4	Effect of sources and levels of nitrogen on performance of sweet corn (*Zea mays* var. Saccharata) on mid hills of Meghalaya	Ms. K. Surjarani	Agronomy	2013	➢ Significantly superior cob yield and net return was obtained with nitrogen application of 120 kg ha^{-1}. ➢ Organic sources of nitrogen (poultry manure and FYM) were at par with urea. ➢ All organic sources left positive effect on organic carbon content and availability status of N, P and K in soil after crop harvest.

Classification/category: Intercropping (Agrotechniques/nutrient management for maize based intercrops)					
5	Effect of planting pattern and organic nutrient sources on performance of Maize-cowpea intercropping	Mr.Vikram Kumar	Agronomy	2014	➢ Paired row planting of maize is a better alternative to accommodate cowpea as an intercrop with maize ➢ Green leaf manure with *Ambrosia* weed biomass could partially substitute the requirement of traditional organic manure FYM.
6	Nitrogen management for maize – legume intercropping in acidic soils	Ms. Saphina Mary Kurkalang	Agronomy	2015	➢ Maize+groundnut intercrop gave significantly higher maize equivalent yield and residual N in soil over maize+soybean intercropping. ➢ N treatment 100% RDN of maize to maize+50% RDN of IC to IC and 75% RDN of maize to maize+100% RDN of IC to IC in maize+ legume intercropping gave statistically similar MEY and:C ratio. ➢ Intercropped legumes gave higher pod and grain yield only upto 50% RDN of IC to IC.
7	Effect of intercropped legumes and their planting pattern on the performance of maize- based cropping system	Ms. Daphibanri Donbar Lyngdoh	Agronomy	2016	➢ Growth and yields of intercropped maize was at par with sole maize. ➢ Intercropping of groundnut in between the paired rows of maize was the best intercrop treatment as it gave higher MEY, LER, net returns and B:C ratio.
8	Effect of population proportion of component crops on the productivity of maize+soybean intercropping	Telkar Shivkumar Gajanan	Agronomy	2017	➢ Treatment 1:1R was a better alternate for maize-soybean intercropping as it gave significantly higher MEY, LER, net return and B:C ratio over sole maize. ➢ This treatment also recorded higher positive apparent N balance and left significantly higher available N in soil over sole maize
Classification/category: Cropping system(Agrotechniques/nutrient management for rice fallows)					
9	Effect of planting geometry and nutrient sources on performance of pre kharif rice and its ratoon	Ms. Sangita Das	Agronomy	2015	➢ Both the main crop and ratoon of rice gave significantly higher yield at closest planting geometry of 15 cm x 15 cm. ➢ Both main crop and its ratoon preformed at par with all the nutrient sources. ➢ Ambrosia GLM could be a good alternative to FYM for promoting organic crop production.

10	Effect of sowing time on summer pulse(s) in lowland rice fallows	M. Bishonath Singh	Agronomy	2018	➢ Cowpea and Frenchbean out performed the greengram and blackgram in rice fallows of midhills of Meghalaya ➢ Grain yields of all pulses was significantly more when sowing was done on 4th March
3.Groundnut					
Classification/category: Nutrient management					
11	INM in groundnut(*Arachis hypogea*) in acidic soils of Meghalaya	Sushree Panda	Agronomy	2020	➢ Seed inoculation with *Rhizobium* and PSB+ 50 % RDF+FYM@2.5tha^{-1} +Eupatorium weed biomass @ 5 t ha^{-1} gave higher pod yield and net return over RDF. ➢ This INM practice also brought a marked improvement in soil bio-physico-chemical properties over the RDF. ➢ Eupatorium, a seasonal weed biomass could be an alternative organic source in FYM scarce situation.
12	Evaluation of potato varieties under different irrigation methods in mid altitude of Meghalaya	Mr. Joy Kumar Dey	Agronomy (Water Management)	2016	✓ The water requirement of Potato was estimated to be 59.69, 51.62 and 41.32 cm under gravity-fed drip, micro-sprinkler and furrow method of irrigation ✓ The BCR values for gravity-fed drip, micro-sprinkler and furrow method of irrigation was 2.27, 2.31 and 1.85, respectively ✓ The performance of Kufri Megha variety was found better over kufri jyoti, kurfi giriraj and kufri giridhar potato variety
13	Influence of organic mulching on soil moisture and yield of rajma (*Phaseolus vulgaris* L.) varieties under mid altitude of Meghalaya	Mr. Yearbok Marwein	Agronomy (Water Management)	2016	• Highest *in-situ* soil moisture depletion was recorded at 0-15 cm depths under un-mulched treatment • The performance of weed mulch was found comparatively better in terms of availability and price • Rajma variety "Selection-9" performed better under Barapani region, Meghalaya and BCR was found better for "weed + selection-9" combination
14	Planting time and irrigation scheduling on the performance of potato in Ri-Bhoi, Meghalaya	Ms. Meghana Gogoi	Agronomy (Water Management)	2017	○Real time based irrigation scheduling at IW/CPE of 1.25 was found suitable for potato production under Barapani, Meghalaya ○Potato tubers planted during 2nd Week of November gave higher gross return, net return and BCR
15	Influence of fertilizer on the performance of black rice (Chakhou) under	Ms. Menaka	Agronomy (Integrated	2018	➢ Black rice performed better under 50% Organic + 50% Inorganic, (Nitrogen fertilization)

	Meghalaya condition	Sharma	Nutrient Management)		under Barapani, Meghalaya with a reported higher grain yield (1.29 t ha^{-1}) ➢ Higher protein content (8.35%), iron content (1.80%) and BCR (2.12) were also recorded under 50% Organic + 50% Inorganic (nitrogen fertilization)
16	Performance of Potato (*Solanum tuberosum* L.) under different irrigation scheduling and organic manure in mid hill of Meghalaya	Ms. Jolyne Margaret Mawthoh	Agronomy (Water Management)	2019	❖ Irrigation scheduled at sprouting + stolonization (stage) is most suitable for better performance (tuber yield of 17.52 t ha^{-1}) and better BCR (2.83) ❖ Performance of Potato was found better under poultry manure application as compared to FYM.
17	Influence of organic mulching and organic manures on growth and yield of black gram	Ms. Dhivya R.S.	Agronomy Nutrient Management	2019	✓ Performance of blackgram (Uttara Var.) was found better with poultry manuring under Barapani, Meghalaya with BCR of 2.24 and economic yield of 1.05 t ha^{-1}
18	Evaluation of Sweet corn varieties under varied date of planting in mil hill of Meghalaya	Mr. Sidhartha Priyatam	Agronomy Water Management	2019	• Under late sowing condition of sweet corn, under sowing during first week of July, the performance was found better for ASKH-6 (cob yield of 6.2 t ha^{-1}), var, under organic amendment • Total soluble solid (TSS) content (11.50%) and protein content (10.44%) was found more for ASKH-6 sown during first week of July
	Cropping System				
19	Effect of Planting Method in Potato-Maize Intercropping During Summer Season	Sanjenbam Dayananda Singh	Agronomy	2012	Ridge and furrow system of maize and potato intercropping with 1:1 ratio may be sustainable system to protect from heavy rainfall and cold temperature in enhancing system productivity
20	Direct and residual effect of Green manure and phosphorus levels on baby corn-baby corn+ groundnut cropping system	Ipsita Kar	Agronomy	2013	The interaction of green manuring with 60 kg P_2O_5 ha^{-1} produced higher yields by augmenting the residual soil fertility for succeeding babycorn and groundnut crops.
21	Dynamics of mineralization of Crop Residues Under Baby Corn-Baby Corn System	Shreyosi Roy	Agronomy	2018	Baby corn being a short duration crop can be used as contingency crop and increase the crop diversification of Meghalaya. Utilization of weed biomass improves the soil fertility.
22	Development of Nitrogen	Shayana	Agronom	2018	The plant dry matter and leaf dry matter based

	Dilution Curve for Baby Corn Based on Leaf and Plant Dry Matter	Laishram	y		nitrogen dilution curve is developed at different stage for precise nitrogen management in baby corn
Rice (Nutrient management)					
23	Influence of phosphorus levels and bioinoculation on growth, spectral reflectance and yield of rice	Raghuveer M	Agronomy	2013	Spectral indices such as NDVI and CI were influenced by P levels and higher were obtained by 60 kg P_2O_5 at 90 days after transplanting. The physical and economic optima of 75.27 and 6.86 kg P_2O_5 ha^{-1} were worked out with *Pseudomonas sp*.
24	Effect of Phosphorus and Zinc on root morphology and productivity of Rice (*Oryza sativa L*).	Hadienlarisa Syiemlieh	Agronomy	2015	Application of 50 kg P_2O_5 with 20 kg Zinc recommended for higher rice yield with its increased nutrient density in grains.
Maize (Nutrient management)					
25	Performance of Quality Protein Maize (*Zea Mays L.*) (QPM) Varieties in Response to Nitrogen Levels.	Badapmain Makdoh	Agronomy	2011	The QPM varieties HQPM 2 and HQPM 1 produced higher yields and are associated with more nutritional value especially proteins and their nitrogen requirement is higher than normal maize
26	Effect of Integrated Nutrient Management Practices on Productivity and Quality of Baby corn	Ms. Jenny Moyong	Agronomy	2011	Phosphorus is most limiting plant nutrient in acid soils of Meghalaya, hence for sustainable quality baby corn production. It should fertilized with 40, 30, 20 kg NPK through chemical fertilizer + 7.5 t FYM ha^{-1} alongwith PSB.
Groundnut (Weed)					
27	Seasonal Variation of Critical Period for Crop-Weed Competition in Groundnut (*Arachis hypogaea L.*)	Santosh Basavant Korav	Agronomy	2017	The critical period for groundnut and weed competition is 15-16 days after emergence. Further, early stage of winter groundnut is more susceptible to weed competition than *kharif* groundnut.
Rice					
Crop Growth Modelling/ Climate Change					
28	Response of Low land Cultivars to N-Application-A modelling approach"	Mr. Kamal Kant	Agronomy	2017	• 2 research papers, one book chapter. • Determined the Genetic Coefficient for CAU-R1, Shahsharang and Lampanah-1 rice varieties DSSAT-CERES-Rice model was found to be effective to predict yield and other growth parameters very closely.
29	"Effect of Climate Change on the performance of Low land rice under N-levels through DSSAT-Rice Model	Mr. Tage Lampung	Agronomy	2018	• 1 research paper • Model run for ±1.2.3 ^{0}C temperature, ±19, 50% rainfall from normal and 450 and 500 ppm CO_2 • Grain yield was found to increase at reduced rainfall upto 18.7 % and at the same time grain yield was reduced at +3^{0}C up to 43.1 %. • Grain yield is expected to increase with the increase of CO_2 level upto 500 ppn with 1^{0}C increase of temperature.
30	"Influence of Integrated	Mr.	Agronom		Thesis not yet submitted. Temporary withdrawal

	Nutrient Management on the Performance of Lowland Rice –A modelling Approach"	Dipankar Bora	y		was approved as joined in the service
Maize					
Crop Growth Modelling/ Climate Change					
31	"Simulating Effect of Climate change on growth and yield of Maize under varying N-applications in the sub-tropical hills of Meghalaya"	Ms. Mesaya R. Marak	Agronomy	2018	• DSSAT-CERES-Maize model was found to be effective in predicting yield and growth parameter at Level-1 conditions • Model run for ±1.2.3 ^{0}C temperature, ±19, 50% rainfall from normal and 450 and 500 ppm CO_2 • Yield is expected to reduce as high as 27.8% at +3^{0}C at present CO_2 and +19% rainfall. Different level of N fertilizer though had incremental yoield of grain, it could not mitigate or reveres the effect of climate change
Pulses					
Resource characterization and evaluation					
32	"Influence of Micro-climate on performance of Kharif Black gram (Vigna mungo)	Ms. Yami Bei	Agronomy	2017	• SBC-47 cultoivar was found to be adaptive to Umiam climate. • SBC-47 can also be sown till 3rd week of August without much compromising the yield. 14th July was found to be the best sowing date for all the varieties, i.e. PU31, SBC-42 and SBC-47
Non-crop					
Resource characterization and evaluation/Resource Conservation/ Application of RS and GIS					
33	" Soil Resource Mapping of a Micro-watershed at Ri-bhoi District of Meghalaya"	Mr. Adelbert Kharlyngdoh		2013	• Mapped soil resources for Nongpoh watershed of Meghalaya with 77% inceptisols, 19% entisols and 4% alphisols • Eight sub-groups of soils were identified with TypicDestrudepts dominating the watershed. Published 1 research paper
34	" Land Use Planning using GIS and RS at Micro-Watershed Level, Meghalaya	Ms. Carolyn Zothansiami	Soil Science and Agricultural Chemistry	2013	• Published 1 research paper • Studied the present land uses in the watershed dominated by Rice, Maize, Pineapple and built ups. • Based of soil characteristics alternative land use was suggested.
35	"Land Use Effect on Aggregation of Acid Soil under Humid Sub-tropic"	Ms. P. Helena Devi	Soil Science and Agricultural Chemistry	2018	• Published 2 research papers. • Found stable soil aggregation in upland rice followed by Jhum
36	"Development of Soil Erodibility Index MapforRi-bhoi District of Meghalaya"	Mr. Manish Olaniya	Soil Science and Agricultural Chemistry	2018	• Published research paper in Scientific Reports (Nature Group) and developed soil erodibility map for Ri-Bhoi disctrict of

					Meghalaya
37	”Comparison of Infiltration Models for Suitability on Hilly Slopes”	Mr. Libi Robin	Soil Science and Agricultural Chemistry	2019	Published 1 research paper • Found Horton Model is effective on all the slopes from flat land to 23% slopes
38	“ Estimation of Soil Loss through RUSLE in Nongpoh Watershed”	Mr. Susanta Das	Soil Science and Agricultural Chemistry		• Published 1 paper in Sustainability and two other paper in different journal. Two more papers are submitted for consideration. • Annual soil loss in the watershed was ranging from 0-1348.08 t/ha/y with an average of 59.94 t/ha/yr, which is extremely high • MMF model estimated by about 5% less soil loss than RUSLE model
39	“Soil Structural Stability and Quality under Different Land Uses”	Mr. Alok Maurya	Soil Science and Agricultural Chemistry		• Thesis not submitted yet
40	“Estimation of Water Footprints in the Peri-Urban Villages in Meghalaya”	Ms. Labetshisha Kharbhih	Soil Science and Agricultural Chemistry		• Thesis not submitted yet
Khasi Mandarin					
Resource characterization and evaluation					
41	“Soil Hydro-physical properties and productivity of Khasi Mandarin along the Hill Slope of Meghalaya”	Mr. Eliazer Ch. Momin	Soil Science and Agricultural Chemistry	2011	• Determined all soil physical properties of a Khasi Mandarin orchards which might have influenced on crop productivity. • Soil water holding capacity was found to be poor where crops were also not performaing well.
42	“Soil Fertility and Productivity of Khasi Mandarin along the Hill Slopes of Meghalaya”	Ms. R. Vanlalduati	Soil Science and Agricultural Chemistry	2011	• Determined all soil chemical properties to understand their effect on crop productivity. • Rejuvenation programme of Khasi mandarin should be slope specific and acidity was found to be most important factor affecting crop productivity.
Vegetables					
Resource management/ water management					
43	”Derivation of Crop Coefficient of Tomato and Capsicum in Sub-Humid Mid Hills Region of Meghalaya”	Ms. Moutushi Tahashildar	Soil Science and Agricultural Chemistry	2015	Found crop coefficients for tomato and capsicum . Capsicum 0.25 0.59 0.24 Tomato 0.55 1.04 0.78 Published 3 research papers. • Blaney-Criddle method can be used in absence of data for P-M Method of ET_0 estimation
44	Effect of Phosphorus and Sulphur on Nutrient	Basant Tamang	Soil Science and	2017	• The combined application of P and S had significant effects on seed and stover yield

	Uptake of Black Gram (*Vigna mungo* L. Hepper) in Acid Inceptisol		Agricultural Chemistry		of black gram. The optimum seed yield (15.08 g pot^{-1}) and stover yield (39.20 g pot^{-1}) were recorded with combined application of 60 mg P kg^{-1}soil and 30 mg S kg^{-1} soil indicating synergistic effect of P and S on each other as both the nutrients mutually help in their absorption and utilization by black gram probably due to balanced nutrition, which was statistically at par with combined application of 80 mg P kg^{-1}soil and 40 mg S kg^{-1}soil.
45	Critical Limits of Available Phosphorus for Rapeseed (*Brassica campestris*var. *toria*) Growing Acidic Soils of Meghalaya	Alok Maurya	Soil Science and Agricultural Chemistry	2017	• The critical limit of available P for Rapeseed (cv. M-27) by Bray P_1 soil test method were established using Linear Response and Plateau (LRP) model as described by Waugh *et al*. (1973) as 38.5 kg P ha^{-1} under Rock Phosphate and 31.0 kg ha^{-1} under Single Super Phosphate in Alfisol, whereas in Inceptisol, the critical limits of available P were established as 37.0 kg P ha^{-1} under Rock Phosphate and 29.5 kg ha^{-1} under Single Super Phosphate.
46	Effect of Organic and Inorganic Nutrient Sources on Performance of Cabbage (*Brassica oleracea* L. var capitata) in Inseptisol	Chingak PW Konyak	Soil Science and Agricultural Chemistry	2018	• 50% RDF + 50% N through vermicompost is the best option for obtaining optimum production of cabbage with superior quality and maintaining soil health of for acid Inceptisol of Meghalaya.
47	Effect of Nitrogen Application through Urea and Azolla on Growth, Yield of Rice (*Oryza Sativa* L.) and Temporal Soil Phosphorus Availability	Shubham Singh	Soil Science and Agricultural Chemistry	2018	• Application of 60 kg N ha^{-1} through urea in combination with incorporation of azolla @ 16000 kg ha^{-1} is the best option for getting optimum production of rice and sustainability of soil health in low land acid soil of Meghalaya. Moreover, the farmers can manage around 30 kg N through incorporation of azolla @ 16000 kg ha^{-1} in rice crop instead of supplying this through nitrogenous fertilizers.
48	Performance of Pea (*Pisum sativum* L.) under Phytoremediated heavy Metal Polluted Soil with Residual Phosphorus	Vanlalmalsawmi Sailo	Soil Science and Agricultural Chemistry	2019	The P concentration in pea straw increased with the increased residual P, whereas the concentration of Cr, Cd, Ni, Pb and Co followed the reverse trend and it decreased with each increasing level of residual P. • The increasing soil available P maintained by higher P application rates for preceding phytoremediating crop may efficiently utilized to phytoremediate the remaining heavy metals contents of the coal mined heavy metals polluted soil and almost normal yield levels of pea cv. Arkel can be

					achieved with 100 mg kg^{-1} soil level of residual P.
49	Biochar as Component of Integrated Nutrient Management and its Significance in Tomato (*Solanum lycopersicum* L.) Productivity in Acid Soil	Ogubuya na Srikant Yadav	Soil Science and Agricultural Chemistry	2019	Plant height, number of fruits/plant, fruit size and fruit yield of tomato was superior with the application of biochar @ 4 t/ha with vermicompost @ 2.5 t/ha and 100% RDF Soil reaction increased with the graded doses of biochar. However, the bulk density showed reverse trend and the lowest bulk density was observed with the application of T_{16}- 100% RDF +B @ 4t/ha + VC @2.5 t/ha.
50	Response of black gram (*Vigna mungo* L. Hepper) to phosphorus and boron fertilization and their temporal availability in acid Inceptisol	Muddana Sri Sai Charan Satya	Soil Science and Agricultural Chemistry	2020	The combined application of phosphorus @ 75 kg P_2O_5 ha^{-1} and boron @ 1.5 kg ha^{-1} is suitable for better growth, higher yield and nutrient uptake by black gram in acid Inceptisol of Meghalaya.
51	Evaluation of Soil Carbon stock under different land uses in Meghalaya	Fellycia S. Basaiaw moit	Soil Science and Agricultural Chemistry	2012	➢ The CEC (Cmol (P+) kg^{-1}) is found high in lowland (Bhoirymbong) than the slope lands due to higher clay content. It was inversely relationship between SOC stock and BD. ➢ Pine forest lowers the SOC content, pH and CEC than permanent grassland. ➢ soil inorganic carbon (SIC) was high at slope land (Sawkilo) of permanent grasses before converting to agricultural land ➢ The SOC stock was found in the order of high altitude slope land (CPRS)> Low lands (Bhoirymbong and Sawkilo)>12%slope land (Sawkilo)>32%slope land Pyllun. ➢ The long period of Rice-Fallow system at lowlands would store more SOC than the slope lands under similar type of management (no addition of manures and fertilizers). The CENTURY simulation SOC stock shows that SOC dynamics will stabilization after 25 years.
52	Effect of Integrated Nutrient Management on Soil Organic Carbon pools and rice productivity	Rupaia Siangshai	Soil Science and Agricultural Chemistry	2013	➢ Different oxidizable organic carbon fractions (OOC), particulate organic matter (POM), microbial biomass carbon (MBC), dissolved organic carbon (DOC), hot water extractable carbohydrates (HWC) and water extractable carbohydrates (WC) were increased with the addition of organic manure (FYM). ➢ SOC pools were found highest at FYM@

					10 tone ha^{-1} + RDF dose of NPK (T5). the highest grain and straw yield of rice and harvest index at T5 treatment.
53	Spatial variability of soil organic carbon (SOC) and available NPK under different toposequences and land cover management	David Long Pani Tao	Soil Science and Agricultural Chemistry	2015	(i) Land cover/uses effect on SOC are found as guava orchard>citrus orchard>ginger/turmeric cultivation at NBPGR1>maize-vegetable>medicinal plant (perilla, coix) cultivation>buckwheat-pulses>maize-fallow>pulses-vegetable>ginger/turmeric cultivation at ICAR-KVK. (ii) The best described semivariograms of SOC and available NPK have been exponential, pentaspherical, exponential and exponential model. The nugget/sill ratio of ICAR-Horticulture is weak spatial dependence of SOC and available N and moderate spatial dependence of available PK.
54	Evaluation of soil test methods for available boron in acidic soils	Rokogeno Charlie-U	Soil Science and Agricultural Chemistry	2015	1. Mehlich-3 and DTPA-Sorbitol can serve as an alternative to hot water without affecting the reliability of B testing in acidic soils. Although hot water can continue as B extractant for NER India, if multi-nutrient extractant is not required. 2. Being a multi-nutrient extractant, adoption of Mehlich-3 and DTPA-Sorbitol can improve the rapidity of soil testing, saving substantial amount of time, cost and labour involved therein.
55	Effect of fallow age of Jhum on soil properties in West Garo Hills district, Meghalaya	Manjunath R.L.	Soil Science and Agricultural Chemistry	2017	Salient findings: 1. Mapping of shifting cultivation using remote sensing and GIS 2. Many farmers of West Garo Hills district were enthusiastically continued second year crop after jhuming. 3. The most prevalent jhum cycle was 4 to 9 years in the West Garo Hills district (68.5%). 4. The minimum jhum fallow period should be atleast 6-7 years to resotore the soil properties in the district at present time.
56	Temporal soil nitrogen availability and its influence on rapeseed (*Brassica campestris* L.) under varying nitrogen	Sowjanya T.V	Soil Science and Agricultural Chemistry	2019	✓ Application of 75% N_{Urea}+25% N_{FYM} was the most efficient nutrient management practice for enhancing rapeseed production. ✓ The highest available K recorded in the

	sources				treatment receiving 100% N_{FYM}. The higher growth, N uptake, yield attributes and yield were recorded with treatment receiving 75% N_{urea}+25%N_{FYM}.

PH.D. THESIS

Natural Resource Management (NRM)					
S. No.	Title of the thesis	Name of the student	Major subject	Year of completion	Outcome (2-3 lines)
Discipline: Agronomy					
Classification/category: Cropping system (Nutrient management)					
1	Integrated nutrient management in vegetable pea – maize cropping sequence	Mr. Samborlang K. Waniang	Agronomy	2018	Dual seed inoculation of vegetable pea+FYM@5tha^{-1} produced high yield of tender green pods, net return and B:c ratio besides leaving more residual N to succeeding maize during both the years. Furrow application of 0.5t ha-1 lime with all three RDF levels has a positive impact on soil properties measured as reduction in AL toxicity, increase in soil pH, population and activities of soil microorganisms and enhanced availability of N,P,K and Ca in soil
2	Estimation of Plant Biomass and Agronomic Management in *Jhum* Cycle of North East India	Hari Charan Kalita	Agronomy	2015	Burning and mulching had differential influence on weed diversity in *Jhum* ecosystem. Fallow cycle of 10 years optimized the yield under mixed and relay crop
3	Seed Priming of Pea (*Piscum sativum L.*) and Residual Soil Moisture Conservation in Rice (*Oryza sativa L.*) Fallow	Yanglem Sofia Devi	Agronomy	2017	Seed invigoration technique has increased the agrophisiological responses of pea under abiotic stresses and normal condition. H_2O_2 is the cheapest source of seed invigoration after hydropriming.
4	Evaluation of Urine as an Alternative Fertilizer Source for Crop Production in North East India	Sanjebam Dayananda Singh	Agronomy	2017	Urine is the potential alternative source of plant nutrients. It can save 50-75% of non renewable inorganic and organic source of plant nutrient resources.
Discipline: Soil Science and Agricultural Chemistry					
5	Effect of amelioration	Markynti.S.	Soil Science	202	1. The coal mine affected soils are categorised

	practices on soil productivity of coal mine affected lowland fields	Lyngdoh	and Agricultural Chemistry	0	to two such as moderately pH (4.40) (i.e. Moonlakhepand) and low pH (3.36) (i.e. Ladrymbai). 2. The identified best treatment in such both the soil is: Compost @10t/ha+ Lime @ 500kg/ha+ microbial consortium.
6	Soil organic carbon mapping and carbon sequestration of hill agro-ecosystems of Ri-Bhoi district	Kabir Debbarma	Soil Science and Agricultural Chemistry	2020	➢ Rabi crop is dominant in 0-1% slope with 536.54 ha, kharif crop in 1-3% slope with 1217.85 ha, Jhuming activity dominant from 8-30% slope with 7040.12-89.46.28 ha and forest cover 6664.92 ha with minor agricultural activity in slope 30% and above. ➢ The ordinary kriging exponential was the best model for the spatial soil org. Carbon mapping. ➢ The soil organic carbon stock was found in the following order as forest (39.48 Mg/ha/year)> current jhum (38.58 Mg/ha/year)> >rabi(37.79 Mg/ha/year)> abandoned jhum(37.46 Mg/ha/year)> kharif (37.11 Mg/ha/year)>both season (36.20 Mg/ha/year). ➢ The carbon sequestration was in the following order as the rabi crop (11.98 Mg/ha/year) > cropping both kharif-rabi season (6.10 Mg/ha/year)> abandoned jhum (5.08 Mg/ha/ year)> kharif (3.55 Mg/ha/ year).
7	Hyperspectral spectroscopic study of soil properties in acid soils of North-East India	Mr. Chandan Goswami	Soil Science and Agricultural Chemistry	2020	(i) The highest and lowest reflectance values were recorded in soils of kharif crop (0.10 to 0.62) and deciduous forest (0.09 to 0.49) in Alfisols, evergreen forest (0.10 to 0.62) and current jhum (0.09 to 0.51) in Inceptisols, and double crop (0.09 to 0.62) and deciduous forest (0.09 to 0.54) in Ultisols. (ii) The suitable wavelengths (bands) were identified for pH (400 to 657 nm, 1388 to 1417 nm & 2149 to 2321 nm), Org. C (504 to 661 nm, 1905 to 1953 nm & 2143 to 2390 nm), N (495 to 781 nm, 1395 to 1421 nm, 1901 to 1949 nm & 2149 to 2316 nm), P_2O_5 (531 to 654 nm, 1384 to 1419 nm, 1900 to 1982 nm & 2145 to 2364 nm), K_2O (400 to 576 nm & 2145 to 2305 nm), Zn (400 to 576 nm, 734 to 854 nm & 2147 to 2297 nm), sand (481 to 671 nm, 1379 to 1417 nm, 1828 to 1930 nm & 2148 to 2296 nm), silt (446 to

					678 nm, 1357 to 1418 nm, 1881 to 1924 nm & 2156 to 2293 nm) and clay (446 to 678 nm, 1357 to 1418 nm, 1881 to 1924 nm & 2156 to 2293 nm).
8	Phytoremediation of Heavy Metal Polluted Soils of Coal Mine Areas of Jaintia Hills and Determination of Critical Limit of Prosphorus for Maize (*Zea mays* L.)	Euwanrida Adleen Shylla Lyngdoh	Soil Science and Agrilcultural Chemistry	2019	Sunflower is adjudged as superior phytoremediating crop in comparison to Asparagus for accumulating more heavy metals form coal mined heavy metals polluted soil. Critical limits of available P for getting maximum/optimum production of maize from heavy metal polluted soils of coal mined areas were established as 21.90 mg/kg for sunflower remediated soil, whereas 27.00 mg/kg for asparagus remediated soil.

MASTER'S THESES

SCHOOL OF CROP IMPROVEMENT

Sl. No.	Title of the thesis	Name of the student	Major subject	Year of passing	Outcome
1. Rice					
DISCIPLINE GENETICS AND PLANT BREEDING					
CLASSIFICATION/CATEGORY: GERMPLASM CHARACTERIZATION AND EVALUATION					
1	Genetic analysis of upland rice genotypes and allele mining for phosphorus deficiency tolerance	Mr. Aibanshan K. Dohling	GPB	2011	Line x Tester analysis was performed to identify the best upland rice genotypes and cross combinations that can be used for varietal development programme to develop soil acidity tolerant upland rice and this led to identification of lines like Dhan and Epyo and testers like RCPL 116 and Bhalum 2 with the best general combining ability while the crosses ARR09 X RCPL116 (L4xT2), N902 X RCPL116 (L3xT2), EPYO X N902 (L1xT3) showed the best specific combining ability. Allele mining on a selected panel of 16 tolerant and susceptible genotypes for *PUP*1 and *PTF1* genes revealed presence of different alleles in some of the genotypes.
2	Divergence studies and path analysis of yield contributing traits in lowland rice (*Oryza sativa* L.)	Mr. Loukham Varun Singh	GPB	2012	Data on 12 yield contributing traits for 21 lowland rice genotypes of the North East India analyzed in 2 different environments, one with application of organic manure and the other with synthetic chemical fertilization, revealed that biological yield (0.772) in organic environment and harvest index (0.6463) in chemical fertilizer environment had the maximum direct effect towards grain yield.The

					two fertilization regimes revealed opposite path coefficient effect for panicle length while path coefficient of days to 50% flowering, plant height, panicles per plant, grains per panicle, 100 grains weight, biological yield and harvest index showed similar positive effect in both the different fertilization regime. Path coefficients of tillers per plant, spikelets per panicle and percent spikelet fertility showed negative effect in both the environments.Based on metroglyph index score of the twenty-one lowland rice genotypes of the North East India, LR 15 (Priya) had the maximum index.
3	Assessment of genetic diversity of upland rice (*Oryza sativa* L.) genotypes from North Eastern Hill Region of India	Ms. PaharasainingSyiemlieh	GPB	2012	Twenty two accessions of rice consisting of short bold, medium slender/mild scented and strong scented including CAU R-1 and Shahsarang were used to study crossability and genetic diversity by 11 RAPD and 7 SSR primers. The Jacaard's similarity coefficient ranged from 0-0.6 and 0-0.86 in RAPD and SSR analysis.
4	Assessment of molecular variation in the known pericarp colour related genes in purple Rice (*Oryza sativa* L.)	Ms. ThoithoiHuidrom	GPB	2012	In the present investigation, a total of 26 primer pairs were tested on 8 genotypes with varying pericarp and endosperm colour to assess the molecular variation in the known pericarp colour related genes in purple rice (*Oryza sativa* L). The primer AF-12 amplified a fragment where, in genotype 12 (Daya- white pericarp), a new deletion was seen immediately after the 'G string' of Rc-g. The characteristic 14bp deletion was absent in all test genotypes. There was removal of the stop codon in genotype 13 (Chak - haoPoireiton). Our results suggest that deletion at the 'G string' without the 14bp deletion can produce a white pericarp phenotype.
5	Genetic analysis of yield contributing traits in lowland rice genotypes and NILs under acidic soil	Mr. Ashim Debnath	GPB	2014	A total of 194 NILs derived from crosses between rice cultivar Swarna and two accessions of *O. nivara*were screened under acidic soil and hydroponic conditions and lines performing well were identified. These lines were K 416, K 413, K 410, S 312, S 310M and S 296.Through Line X Teter analysis, Sahbhagi Dhan X Kasalath and Priya X IR 24 were identified as best cross combinations. Priya and Sahbhagi Dhan were identified as best general combiners.
6	Morphological and molecular characterization of	Ms. Anni Lego	GPB	2017	Genotypes SR-3925-13-1, IRCTN-91-77, Tami Hikari, Niver, Gurrah were identified as early flowering genotypes to be used for breeding

	upland rice germplasm and screening for the presence of fertility restorer genes				programme. For primers DRRMRF3-5 and DRCG-RF4-14, 89 and 125 genotypes, respectively were found to be homozygous for restorer gene.
7	Grain quality characterization and molecular diversity analysis of aromatic rice (*Oryza sativa* L.) genotypes using SSR markers	Mr. Wadbok Rani		2018	Ja-Pnah (82.18%) followed by IC-465275 (81.55%) recorded the highest carbohydrate content, CT3-D-4 (11.69%) recorded the highest protein content %, IC-137342 (0.99%) recorded the highest fat content.Three major clusters were identified; Cluster I is the largest cluster with 15 genotypes, Cluster II is the second largest cluster with 13 genotypes and Cluster III consisted of 4 genotypes. Highest PIC value was recorded for RM447 (0.750) and lowest for RM125 (0.236). Maximum diversity was observed between IC-137401 and IC-342368 (0.98), followed by IC-342368 and IC-326284 (0.97).
8	Agro-morphological characterization and genetic diversity analysis of aromatic rice (*Oryza sativa* L.) genotypes using SSR Markers	Mr. Pramod Kumar		2019	The genetic distance between the 42 accessions of aromatic rice ranged from 0.03 to 0.87; genotype RM495 (82.6%) recorded highest per cent of polymorphismIC-342368 and IC-401209 showed maximum genetic distance on the basis of morphological analysis. The genetic dissimilarity between the 42 accessions of aromatic rice ranged from 0.06 to 0.42. Maximum genetic dissimilarity was found between IC-137401 and Ja-Shulia genotypes.
9	Molecular characterisation and evaluation of a panel of aromatic mutant-M_7 rice (*Oryza sativa* L.) for yield performance and blast resistance	Mr. Samuthirapandi S.		2019	A total of 60 alleles were detected in 22 loci with minimum and maximum of 2 and 4 alleles per locus with average of 2.7 in 33 genotypes, respectively. PIC value ranged from 0.061 (by RM251) to 0.616 (by RM452) with average of 0.390. Molecular analysis of blast resistance in a 33 genotypes showed that, all mutant genotypes had *Pi1, Pi12* and *Pi20(t)* blast resistant genes out of 5 genes screened except *Sabhagidhan* (as resistant check) genotype which had four resistant gene *viz*., *Pi1, Pi2, Pi12* and *Pi20(t)* and *Chakhao poireiton* (susceptible check) which had only two resistant genes *viz*., *Pi1* and *Pi12*. *Pi2* was found in only *Sabhagidhan*
CLASSIFICATION/CATEGORY: ABIOTIC STRESS TOLERANCE					
10	Path analysis for yield component traits in upland rice and allele mining for aluminium toxicity tolerance	Ms. KhriedinuoPfukrei	GPB	2011	A combination of 23 yield contributing characters spread over various stages of crop growth from a set of 21 upland rice genotypes was used to predict the response of grain yield using path analysis. Partitioning of correlation coefficients between response and predictor

					traits, revealed that traits such as the number of primary branches/panicle (0.630), spikelet fertility (-0.673), number of filled grains/panicle (0.530), 100 grain weight (0.184), number of tillers (0.858), EST (0.498) and panicle weight (0.692) had significant direct or indirect effect on grain yield/plant. For allele mining, eight rice genotypes (4 tolerant and 4 susceptible) were selected based on relative root growth (RRG) from the results of a hydroponic experiment in Magnavaca solution, where aluminium was used as treatment.
11	Screening of a core set of rice germplasm for response to low light intensity and identification of tolerant and susceptible genotypes	Mr. Karyom Bam	GPB	2014	Characters like spikelet fertility %, grain yield/plant and biomass are important characters for screening rice genotypes under low light intensity.IRCTN 91-84, IRCTN 91-94, RCPL 1-4C and RCPL 1-9C were identified as tolerant to low light intensity. IRCTN 91-84 can be used as donor for breeding for low light tolerance.
12	Evaluation of rice mini-core collection for response to Phosphorus deficiency under lowland conditions	Mr. Laldintluanga	GPB	2015	Indian rice mini-core along with local accessions evaluated (#154) for iron toxicity and low phosphorus deficiency tolerance. Genotypes like LR 18-2, BAM 5891, BAM 698, BAM 1264, BAM 1057, BAM 1098, BAM 785 and BAM 8364 were identified as good performers in lowland soil conditions. These identified lines could be used to study the mechanism of tolerance as well as potential donors for traits listed above.
13	Line X Tester analysis of a set of rice genotypes and evaluation for heat tolerance at grain filling stage	Mr. Lalruatmawia	GPB	2015	Trait profiling of genotypes under heat treatment showed that genotypes TRC 12, RCPL 1-136, RCPL1-186, RCPL1-188 could be good donor sources for key breeding traits like grain yield/plant, spikelet fertility, root biomass, 1000 grain weight etc. The trait profiling also predicted ten cross combinations of which TRC 9 x TRC 12 and RCPL1-188 x TRC12 were predicted as the most promising.
14	Evaluation of rice mini core collection for aluminium toxicity tolerance and blast resistance under upland conditions	Mr. N. Radhakishore	GPB	2015	Indian rice mini-core along with local accessions evaluated (#154) for aluminium toxicity tolerance and blast resistance. UR 3, BAM 811, JR 31 and UR 17-2 were identified as best performers for aluminium toxicity tolerance.
15	Evaluation of rice mini core collection for response to low temperature at	Ms. BapsilaLoitongbam	GPB	2015	Indian rice mini-core along with local accessions evaluated (#154) for cold tolerance. For low temperature tolerance, UR 100 and were identified as tolerant ones.

	reproductive stage				
16	Marker assisted pyramiding of drought tolerant QTLs qDTY1.1 and qDTY3.1 in rice variety Samba Mahsuri Sub-1	Ms. Dake Deepika	GPB	2020	Pyramided lines SABD-9, SABD-76, SABD-79 and SABD-80 carrying two drought tolerant yield QTLs qDTY1.1 and qDTY3.1 performed well, showing greater tolerance than parents under stress conditions.
CLASSIFICATION/CATEGORY: BIOTIC STRESS TOLERANCE					
17	Marker assisted selection (MAS) of backcross progenies for introgression of blast resistance genes in lowland rice	Mr. George Ferdinand War	GPB	2013	Eleven best advance back cross lines carrying multiple blast resistance genes in the background of CAU R-1 and Shahsarang were selected.
18	Marker assisted selection (MAS) of backcross progenies for introgression of blast resistance genes in upland rice	Ms. Mayalang RJ Najiar		2014	A set of backcross progenies derived from two distinct crosses were evaluated for presence of favourable allele for blast resistance followed by phenotypic screening revealed 11 families with 45 plants carrying 1 gene and 29 plants carrying 2 genes of interest. From the other 200 BC3F1 progenies screened for donor foreground of IRBL 9W, 1 family showed positive results with 3 plants carrying the gene of interest. Characters for the BC3F1progenies were also recorded to assist background selection to identify which progeny resembles the recipient parent, Bhalum 3 the most.
CLASSIFICATION/CATEGORY: WIDE HYBRIDIZATION					
19	Intervarietal hybridization and genetic diversity of rice by molecular markers	Ms. Diploma Debbarma	GPB	2013	Fourteen RAPD and 8 SSR primers were used to assess the genetic variability of 17 commercially cultivated rice varieties from North India and North East (CAU R-1 and Shahsarang). Jacaard's similarity coefficient for RAPD ranged from 0.28-0.77 whereas for SSR it ranged from 0.07-1.
CLASSIFICATION/CATEGORY: VARIETAL DEVELOPMENT					
20	Molecular characterization of advanced breeding lines of lowland rice and their evaluation for grain quality traits	Mr. I. Gopinath		2018	Superior breeding lines, *viz*. CAUS103, CAUS104, CAUS105 and CAUS107 were identified for nomination to AICRP trials. Lines carrying favourable alleles for *Chalk5*, *Pita* and *Pi54* were identified. SSR marker profile for advanced breeding lines were obtained.
21	Characterization and evaluation of advanced breeding lines of lowland rice with respect to agro-morphological traits	Mr. Ashish Rai		2018	Superior breeding lines, *viz*. CAUS103, CAUS104, CAUS105 and CAUS107 were identified for nomination to AICRP trials. Blast resistant and Fe toxicity tolerant lines were obtained. DUS characteristics were recorded for all the lines.

22	Genetic analysis of elite rice breeding lines for allelic status of agronomically important genes and combining ability	Mr. Shanmugam A		2019	Five blast resistance genes (*Pi1, Pi12, Piz, Pb1* and *qPbm11*) and two yield genes (*SCM2* and *TGW6*) were found to be fixed in the selected elite lines. Crosses, viz. CAUS105 x VL40387, CAUS103 x UPRI-3908-18-2-1-1 andCAUS 105 x HPR 2921 were found to have significant SCA, good to moderate parental GCA, with good *per se* performance for yield related traits and thus, these could be forwarded for pure line development using marker assisted selection.
DISCIPLINE: PLANT MOLECULAR BIOLOGY AND BIOTECHNOLOGY (PMB)					
CLASSIFICATION/CATEGORY: GERMPLASM CHARACTERIZATION AND EVALUATION					
23	Crossability studies and characterization by molecular markers in rice (*Oryza sativa* L.) accessions	Ms. Spurty Tripura		2013	Eleven RAPD and 7 SSR primers were selected (out of 14 and 8, respectively) to assess the genetic diversity of 20 accessions and 2 rice varieties. A total of 42 RAPD amplicons were generated. The average number of amplification products formed was 3.84 with a maximum of 7 in OPD-08 and a minimum of 2 in OPD-07.
24	Allele mining and wide-hybridization approach for enhancing yield in rice	Ms Bindanchi T.M. Sangma		2015	Allele mining across *Rdd1* gene suggested that allele A (600 bp) can be used in breeding programmes to enhance grain length in rice. Allele A (205 bp) of RM 478 and allele B (240 bp) of RM 574-2 associated with low grain weight and grain width, respectively can be used for rejection at seedling stage in marker assisted breeding programme.
25	Evaluation of putative mutant populations in rice (*Oryza sativa L.*) and rapeseed(*Brassica rapa syn. campestris*)for aluminium toxicity tolerance	Mr. Limasunep Longkumer		2016	Genotypes TS38 and M27 are better performers for Al toxicity tolerance.
CLASSIFICATION/CATEGORY:MOLECULAR MAPPING					
26	Study of sequence polymorphism at DREB loci in relation to seedling stage cold tolerance in rice	Ms. Clarissa Challam	PMB	2011	Diverse genotypes from NEHR along with known international cold tolerant lines were screened for cold tolerance at germination and seedling stageand it was found that the cumulative score of 7 parameters was a good indicator, distinguishing cold tolerant from sensitive genotypes and the most contrasting genotypes both from Arunachal Pradesh identified.PCR amplification of the OsDREB1A and OsDREB1B across a panel of 15 diverse genotypes revealed presence of 2

					and 5 SNPs, respectively.
27	Identification and cloning of cold responsive genes in Rice	Ms. TsheringChomu Bhutia	PMB	2012	Present study was carried out to find the novel genes, to validate the responsiveness in two rice landraces (UR5 and UR 17-2) adapted to low temperature by RT-PCR method and clone the selected genes into an appropriate vector. Out of 10 selected genes, 6 showed amplification when standardized with genomic DNA. RT-PCR experiment showed that at 24 hours stress 2 genes (OsZim and OsFbx257) show differential expression. While at 3 hours 4 genes viz, OsPs, OsFbx257, OsZim and OsPal were differentially regulated. The OsFbx257 gene was successfully cloned. This gene could be evaluated further for its role in plant under low temperature.
28	Identification and tagging of gene(s)/loci showing differential response to phosphorus deficiency in rice	Mr. FirstbornsonDkhar	PMB	2013	F_2 Mapping population involving parents Chakhao Poroiton and Shahsarang was evaluated for Phosphorus deficiency tolerance and 10 informative markers identified.
29	Association of genic markers for phosphorus deficiency tolerance in rice biparental populations	Ms. SalamgwamlieMichui	PMB	2015	In a F_2 rice population, it was observed that the flag leaf dry weight, fresh leaf weight and leaf width were significantly correlated with P uptake, while leaf width was found to be correlated with PUE under lowland acidic field conditions. Four novel gene based polymorphic markers were identified from markers designed targeting ten genes identified from root transcriptome data. The results showed that marker CG 1-2 associates with three phenotypic traits {(tiller number at 60 days after transplanting (DAT)} and at 90 DAT and leaf number), CG-111-3 with one trait (plant height) and CG-113-1 with one trait (leaf area).
30	Marker assisted pyramiding of drought tolerant QTLs in rice variety SambaMahsuri Sub-1	Ms. DiezelhounoChuchua	PMB	2017	The F_2 progenies carrying both the "drought tolerant yield" QTLs qDTY 1.1and qDTY 2.2 QTLs (inhomozygous or heterozygous condition) were generated and evaluated under moisture stress for various physiological parameters. As per physiological studies the plants in lines SAB1, SAB2, SAB7 and SAB4 were found to be performing better under moisture stress.
31	Characterization of a panel of contrasting rice genotypes for low phosphorous tolerance using morphological	Mr. Ebenazar Gympad	PMB	2018	A set of 60 diverse rice genotypes selected from the previous study on 110 genotypes were evaluated for performance with respect to 15 different traits under lowland, acidic P deficient soil conditions using

	and molecular markers				morphophysiological and molecular parameters. Significant correlation of our data with previous field data (2014) for 11 agronomic traits suggests that the genotypes and traits identified can be used for various breeding and crop improvement programmes for low P tolerance. The correlation matrix showed that panicle length, leaf area and biological yield were significantly correlated with grain yield. Marker K46-2 showed significant association with panicle length and test weight.
32	Bulk segregation for blast resistance in F2 population derived from two contrasting rice genotypes of North Eastern hill region	Ms. HageSumpi	PMB	2018	Blast resistance genePi20t was found to be associated with resistance to local pathotypes of *Magnaporthegrisea* (rice blast pathogen).
33	Characterization of advanced inbreed lines for low phosphorous and iron toxicity tolerance	Mr. Shaikh Akbar Rasul	PMB	2018	Two advanced breeding lines i.e., 51(BC_2F_9) near isogenic lines (KM lines) and recombinant inbred lines (235 plants; $F_{3:4}$; ULRC-36) were evaluated for iron toxicity and low P tolerance under lowland acidic field. Lines like KM-194, KM-608 and KM-660 identified as good performers.
34	Molecular characterization of selected RILs derived from two low phosphorous tolerant rice genotypes	Ms. T. Oshin Sharma	PMB	2018	In a set of 1600 individuals (F_5) (recombinant inbred line (RIL)) generated from LR23 (Sahbhagi Dhan; *PsTOL1*$^+$) X LR26 (Chakhao Poreiton; *PsTOL*$^-$) was phenotypedchi-square test for goodness of fit revealed that HvssR02-14, RM527, snpOS0303, snpOS0304, snpOS0305, snpOS0306, BADH2 and Chalk5 showed significant values, suggesting preponderance of LR23 allele in markers 02-14 and chalk5 and LR26 allele for other six markers. A sand based screening using Yoshida solution on these 20 lines along with the parents revealed significant differences in control and treatment conditions for all the six traits suggesting that the performing lines were distinct for both phenotypic and genotypic traits and therefore, can be used for further selection of best lines under lowland acidic soil conditions.
2. Maize					
DISCIPLINE GENETICS AND PLANT BREEDING					
CLASSIFICATION/CATEGORY: GERMPLASM CHARACTERIZATION AND EVALUATION					
35	Evaluation of maize landraces of North-	Ms. Miranda Sanjenbam	GPB	2013	Cluster analysis of the 139 maize landraces studied revealed that the groping was based on

	Eastern Hill Region of India for genetic diversity and Turcicum blight resistance				ear weight variability rather than geographic origin. For NCLB resistance, qualitative disease assessment under natural field conditions followed by controlled quantitative assessment based on Area Under Disease Progress Curve scores were consistent for thelandraces studied implying genetic basis of inheritance.
36	Combining ability studies of a set of QPM (Quality Protein Maize) inbred lines under acidic soil conditions	Ms. Backiyalakshmi C.	GPB	2016	Diallel mating studiesfor tryptophan content and grain yield under acidic soil conditions identified QPM lines and crosses which showed promise for developing lines with high tryptophan content and grain yield.
37	Tryptophan content analysis in F2:3 families of six quality protein Maize crosses	Mr. Pawan Kumar Khati	GPB	2018	Kernel characterization and tryptophan content analysis for identifying useful segregants from $F_{2:3}$ QPMfamilies derived were effective for lines with kernel modification scores of 2-3. Both high and low levels of tryptophan were observed in the segregating generation indicating selection would be effective in the presence of variability for tryptophan content.
38	Selection for hard endosperm, tryptophan content and yield contribution traits in F3:4 QPM families	Mr. Mariyappan. S. B.	GPB	2018	Study of homozygous QPM lines from $F_{3:4}$ generation families for high tryptophan using SSR markers for *o2* and *o2* modifiers could identify five lines with % tryptophan values ranging from 0.90 to 0.94 identified as distinct from non QPM maize for further line development programme.
39	Combining ability studies for yield and yield attributing traits in maize (*Zea mays* L) inbred lines developed from north eastern hill region (NEHR) of India	Mr. Harsha Vardhan Rayudu Jamedar	GPB	2019	Half diallel studies among the inbred lines developed from landraces of NEHR of India for yield and yield attributing traits indicated non-additive gene action for most quantitative traits studied. Ear related traits were highly significantly correlated to grain yield in both red and yellow kernel lines studied.
CLASSIFICATION/CATEGORY: ABIOTIC STRESS TOLERANCE					
40	Identification of water logging tolerant maize (*Zea mays* L.) landraces from Northeast India	Mr. KunaljitDebbarma	GPB	2014	A set of sixty maize landraces collected from different states of North Eastern Hill region screened for water logging tolerance revealed presence of genetic variability among the landraces for critical parameters -shoot to root ratio, ability to form adventitious roots and lysigenousaerenchyma.
41	Study of aluminium toxicity among maize landraces of North Eastern Hill Region (NEH) of India	Ms. NiraliMoirangthem	GPB	2015	The studies based on hydroponics for root characters and hematoxylin staining revealed that high staining of root tissues was negatively correlated with decreased root lengths. Path Analysis studies of treated plants grown to

					adult stage suggested that selection criteria for higher yield based on ear weight and total grain weight would be effective for improving yield.
42	Evaluation of full sib families for aluminium and water logging stress in a set of identified maize *(Zea mays* L.) landraces	Ms. Baltachina. G. Momin	GPB	2016	Seedlings of second generation full sib maize families screened under hydroponics at highly toxic Aluminium concentrations recorded differential response for shoot dry weight for families with both high and low Net Seminal Root Length. For submergence tolerance, families with higher Water Tolerance Coefficient recorded greater ærenchyma and adventitious roots production.
CLASSIFICATION/CATEGORY: BIOTIC STRESS TOLERANCE					
43	Genetic gain in response to selection for yield contributing traits and Turcicum blight resistance in maize (*Zea mays* L.) landraces	Ms. Moutushi Sarkar		2015	Directional selection on the basis of cobweight done in ten maize landraces previously identified to be resistant to *Turcicum* blight disease identified five population showing higher resistance compared to the check line under study. Genetic gain in the progeny population was highest for cob weight.
44	Characterization of identified maize Inbred lines for resistance to northern corn leaf blight (NCLB)	Mr. ShimreisoVashum	GPB	2017	A set of 39 maize inbreds consisting of 34 full sib families, 3 QPM lines and two reference checks for NCLB were used for phenotyping and genotyping. The full sib family M9 (4)-39X42 with a very low field (4%) as well as AUDPC score of 3.42scored similarly as the resistant check for markers bmc1152 and umc1149 which tag close to reported *Ht2* and *HtN* genes for resistance in bin 8.06. Similarly, sib familiesN25 (5)-2X1, Ma5 (7)-3x5 and S16 (9)-4X8 with AUDPC scores over 40 were comparable with the susceptible check for SSR markers umc 1947 and phi 053.
45	Generation Mean Analysis for inheritance of Northern Corn Leaf Blight Resistance in maize of North East Hill condition	Ms. ViolinaBharali	GPB	2019	The mode of inheritance and gene action governing NCLB resistance in three different maize populations developed from inbred lines indigenous to North East Hill Region of India revealed that mode of gene action governing resistance to NCLB was population specific. Highly significant mean effects for the resistance parameters studied implied that NCLB inheritance was under polygenic control in all the three populations studied.
46	Phenotypic and genotypic characterisation in segregating biparental population of maize (*Zea mays* L.) for Turcicum leaf blight	Mr. Sugumar S.	GPB	2020	A total of twenty seven generations from three bi parental crosses using resistance parameters Area Under Disease Progress Curve, Disease Severity and Incubation Period under artificial epiphytotics studies revealed that disease progression for *Turcicum* leaf blight in the segregating F_2 and F_3 generations was variable

	resistance				in the three crosses studied. Joint Scaling test revealed the presence of non-allelic interactions in Cross 1 and Cross 3 along with a preponderance of dominance gene action as shown by Generation Mean Analysis. A high additive genetic varianceresulting in high narrow sense heritability was also observed for Cross 1.
3. LEGUMES					
DISCIPLINE GENETICS AND PLANT BREEDING					
CLASSIFICATION/CATEGORY: GERMPLASM CHARACTERIZATION AND EVALUATION					
47	Assessment of genetic diversity of pea (*Pisum sativum* L.) using morphological and molecular markers	Mr. HandersonChule t	GPB	2011	Genetic diversity study among 34 pea genotypes (Pisum sativum L.) including 7 already adapted varieties of this region, 21 advanced breeding lines and 6 local cultivars was performed using 16 morphological markers and 15 SSR markers. The number of alleles per SSR marker varied from 2 to 5, with an average number of 2.866 alleles per locus.The diverse genotypes revealed from both the dendrograms were IPFD 09-2, HFP-620, Azad P-1, Matek, IPFD 1- 10, CAU FP-1, IPFD 09-3, Pant P-136, Rachna, E-6, Matek and LP-3.
48	Genetic diversity analysis of blackgram [*Vigna mungo* (L.) Hepper] using morphological and molecular markers	Ms. Artibashisha Hijam Pyngrope	GPB	2012	Genetic diversity study among 30 blackgram genotypes [*Vigna mungo* (L.) Hepper]was performed using 21 morphological markers and 20 SSR markers. In cluster analysis, the local germplasm grouped separately from the advanced breeding lines and locally adapted varieties. The study also revealed some genetically distinct WBB-1, VBG 09-005 and IPU 10-17.
49	Assessment of genetic diversity in ricebean (*Vigna umbellata*) germplasm using morphological and molecular markers	Ms. Yengkhom Sanatombi Devi	GPB	2017	Morpho-molecular evaluation of 120 ricebean accessions identified 7 clusters based on morphology and cG9589C1 as the most informative SSR marker. Chak-hawai-31, BKSB and chak-hawai-1 were identified as the most promising genotypes.
50	Crossability studies and genetic diversity in black gram using molecular markers	Mr. Puyam Tondonba Singh	GPB	2018	A total of 15 crosses were made with KU-16-33 having the highest pollen fertility. Based on PIC value, primer CEDG118 and CEDG279 were found to be informative. In factorial plot analysis, the first axis explained 18.66% variation.
51	Characterisation and evaluation of some genotypes of soybean [*Glycine max* (L.) Merrill] under acidic	Ms. Yengkhom Linthoingambi Devi	GPB	2019	The maximum yield per plant was recorded in the genotype TS-53 followed by SKF-SPS-11 and MACS-1493. Lowest yielder genotypes were MACS-1575 followed by NRC-130. Genotype CSB-10112 had the highest protein

	soil condition in Meghalaya				content (45.1%) and genotype NRC-131 was found to have highest oil content (20.1%). Clustering of genotypes for studying genetic diversity was performed by Tocher's method of clustering in D^2 analysis. In which 4 clusters were formed. Based on hydroponic study under 25 µMaluminium treated solution, the genotype TS 53 was found to have least root length difference from the mean value and so, was recorded as tolerant genotype followed by the genotype JS 335 and MACS 1493. The genotype NRC 130 was found to have more root length difference and was recorded as susceptible genotypes and was succeeded by the genotype MACS 1575 and NRC 137. Under 75 µMaluminium treated solution, the result showed genotype TS 53 as tolerant genotype followed by the genotype JS-335 and MACS-1493 while the most susceptible genotype was MACS 1575 followed by NRC 130 and NRC 129.
DISCIPLINE: PLANT MOLECULAR BIOLOGY AND BIOTECHNOLOGY (PMB)					
CLASSIFICATION/CATEGORY: GERMPLASM CHARACTERIZATION AND EVALUATION					
52	Crossability and genetic diversity studies in Pea *(Pisum sativum)*	Mr. Dipen Nama Adhikari	PMB	2017	Maximum number of fruit set was recorded in VRP-61 x VRP-228 cross. SSRs AA446 and AA473 were found to be most informative.
53	Hybridization and genetic diversity in *Vigna unguiculata (L.) Walp.*	Ms. TanniRangkham	PMB	2017	A total of 27 polymorphic SSR primers were selected to assess genetic diversity of 36 accessions of cowpea revealed 72 alleles and two clusters i.e. Cluster I and Cluster II comprising of 14 and 22 accessions, respectively.
54	Studies on crossability between various accessions and genetic diversity in cowpea *(Vigna unguiculata (L.) Walp.)*	Mr. BipramaniNameirakpam	PMB	2017	In PCA plot, the first component explained 18.56 % variation and the second and third component explained 16.85 % and 12.77 %, respectively among the 36 accessions of cowpea using 30 RAPD primers. Genotypes PL-2 (C-27) and CP-7 (C-30) were identified as distinct and can be part of future breeding programmes.
55	Hybridization and genetic diversity in pea	Mr. Dharmendra Singh Lagoriya	PMB	2017	Based on Euclidean distance and dendrogram two major clusters Cluster I and Cluster II comprising of 27 and 13 accessions, respectively were revealed. The cultivars Makochabi 1 and Debgiriwere identified as distinct from the other 38 pea accessions.
56	Genetic variability analysis of Faba bean (*Viciafaba*L.)	Mr. Balaji S.	PMB	2020	The Faba bean genotypes used in the study showed variability among the genotypes. However, there was little association of genetic

	Genotypes of North East Hill region of India using Morphological Characteristics and SSR markers				divergence and ecological origin of genotypes. Some genotypes were identified having promising performances in terms of agronomic traits and can be further utilized for future crop improvement programme.
CLASSIFICATION/CATEGORY:TISSUE CULTURE					
57	Standardisation of *in vitro* regeneration protocol and genetic diversity analysis in Blackgram using RAPD markers	Ms. Vedulla Usha Tejaswini	PMB	2019	Best rooting medium was BAP 1.0 mg/l with IBA 1.0 mg/l. The primers OPG-03 and OPH-04 were found to be most informative with genotypes PANT-U-6 and GP-52-NO-5/31 as the most diverse.
58	*In vitro* regeneration and genetic diversity analysis in soybean using SSR markers	Ms. SakuonuoTheunuo	PMB	2019	MS medium containing 2 mg/ml BAP gave 100% response in explants. Single coty-node of CSB 10084 genotype gave the highest number of shoots in MS media augumented with 1.75 mg/l BAP and 1 mg/l KIN. PIC value was the highest for markers Satt571, Satt230 and Satt129.
4. SPICES (chilli; ginger; turmeric)					
DISCIPLINE GENETICS AND PLANT BREEDING					
CLASSIFICATION/CATEGORY: GERMPLASM CHARACTERIZATION AND EVALUATION					
59	Study of morphological and genetic variability in ginger accessions of North-East	Mr. Aiarson K. Sangma	GPB	2014	Out of a total of 48 ginger accessions from N.E. India Nadia, WGH1, EGH2, JH4, JH6 and Suruchi were found suitable for higher rhizome yield (>25 t/ha); Varada, Ernad, JH1 and Suprabha were suitable for low fibre content (<4.5%); Khasi local and JH10 were suitable for higher oleoresin content (>7%).Association studies and path analysis revealed that plant height, rhizome thickness and number of fingers per rhizome were good traits for indirect selection for higher rhizome yield by virtue of their higher positive direct effect as well as indirect effects through other traits. These characters also possess higher GCV and heritability values.Twenty seven (27) out of 39 ISSR primers generated sufficient polymorphism to differentiate the 48 accessions at DNA level. Molecular diversity assessed through Nei's similarity coefficient was narrowed except for few genotypes which were highly divergent (WGH3 and JH11).
DISCIPLINE: PLANT MOLECULAR BIOLOGY AND BIOTECHNOLOGY (PMB)					
CLASSIFICATION/CATEGORY: GERMPLASM CHARACTERIZATION AND EVALUATION					
60	Diversity analysis of chilli germplasm in North East India by	Ms. Julia Sunderi Yumnam	PMB	2011	Diverse chilli germplasm (thirty-eight in number) collected from different areas of the North-East were evaluated using

	using morphological and molecular markers				morphological parameters and 52 SSR primers. A total of 27 markers polymorphic with maximum alleles detected for Hpms116 (7 alleles). Four clusters were observed. It was observed that plants having erect fruits clustered together and so was the case with campanulate fruits. Percentage variation among populations, within individuals of population and within individuals was found to be were 29.43%, 14.62% and 55.95% respectively indicating diversity in the landraces sampled.
CLASSIFICATION/CATEGORY:MOLECULAR MAPPING					
61	Molecular Characterization of King Chilli (Bhutjolokia) and DalleKhursani accessions with reference to pungency related genes	Mr. Lalduhzuala Colney	PMB	2017	Morphological and molecular markers identified distinguishing king chilli from Dale khurasani. The SSR and sequencing data leads supports to morphological evidence that Dallekhursani is a pungent *C. annuum.*
CLASSIFICATION/CATEGORY:TISSUE CULTURE					
62	Micropropagation and DNA fingerprinting of ginger *(Zingiberofficinale)* genotypes cultivated in Meghalaya	Mr. L. Victor Khonglah	PMB	2011	Out of four genotypes studied for micropropagation only two i.e. Nadia and Ingbah were found to be responsive. The 8 SSR markers used in this study were found to be monomorphic across all the 11 genotypes. 17 RAPD markers produced a total of 93 bands of which 47 were polymorphic (50.5% polymorphism). A total of 12 ISSR markers were found to be most suitable as they were able to differentiate between all genotypes except Jamaica and Khasi local.
63	Inter-specific hybridization and embryo rescue in Capsicum	Mr. Chandan Debbarma	PMB	2011	In the crossability studies, out of the three species (viz. *Capsicum annuum, Capsicum chinense andCapsicum frutescens*) crosses with two varieties of *Capsicum annuum,* viz. PusaJwala and Kashi Anmol, showed success. In *in-vitro* investigation ofembryo rescue, the optimum timing for explants collection was found to be 27-33 days after pollination (DAP). The highest percentage of embryo growth was observed with the hormone concentration of 0.5 mg l^{-1} GA_3 and 0.05 mg l^{-1} of NAA. Hybridity test was confirmed with morphological markers and RAPD markers like OPV-12 and OPZ-4.
64	Standardization of regeneration protocol	Mr. Karma Landup Bhutia	PMB	2015	Micro-propagation of a pungent chilli (DalleKhursani) from Sikkim standardized.

	for increasing capsaicin content in *Capsicum sp. (Dallekhursani)*				
65	Genetic fidelity assessment of *in vitro* regenerated King chilli *(Capsicum chinensis Jacq.)* using molecular markers	Ms. Careen Nongrum	PMB	2018	Out of 20 MS media combinations tested, 12 meia were found to be effective. The maximum number of shoots per explant were observed for MS18 (20 μM BAP + 10 μM IAA). Out of 28 selected RAPD markers, 16 gave unique band. Shoot tips, nodes and internodes *in vitro* regenerated explants showed monomorphism.
66	Production of virus free quality planting material in chilli var. Dallekhursani by *in vitro* meristem tip culture	Ms. Saumika Bhattacharjee	PMB	2019	Cucumber mosaic virus free plants regeneration protocol using meristem tip culture developed for Dallekhursani and confirmed using molecular methods. The protocol can be used for large scale production of pathogen free planting material.
67	Evaluation of curcumin content and genetic diversity using molecular marker inturmeric genotypes cultivated in North East India	Ms. Magar Sayali Ganesh	PMB	2019	Among the 112 treatments checked for regeneration, BAP (3.5 mg/l with NAA (1.5 mg/l) gave the best result. PIC values ranged from 0.497 to 0.222. The curcumin content was the highest in Lachin (8.9%).
5. Others					
DISCIPLINE GENETICS AND PLANT BREEDING					
CLASSIFICATION/CATEGORY: GERMPLASM CHARACTERIZATION AND EVALUATION					
68	Genetic divergence study in selected germplasm lines of *Mucunapruriens* using morphological, biochemical and molecular markers	Ms. BabuhlinKharjana	GPB	2016	Twenty ISSR and SSR primers when used produced a total of 43 alleles among 11 Mucuna accessions with locus PH9B2 was the most informative marker. . Depending on the variability present in the accessions, MPWBN-03 can be selected for higher seed yield and MPWBN-07, MPNGL-41 and IC-83195 can be taken in hybridization programmes for further improvement of the traits.
69	Assessment of genetic diversity in Job's Tears germplasm using morphological and SSR markers	Ms. Bharati Lap	GPB	2016	Genotypes JTN 11 and IC-89392 were identified as most promising genotypes based on grain yield data. IC-417053 with highest phenol content and high antioxidant content may be used as a parent in future breeding programme.In molecular characterization with SSR primers a total of 62 alleles were generated with an average of 3.87 alleles per locus using 16 microsatellite markers.GBssrJT198 was the most informative marker and two alleles unique to wild accessions only were also obtained.
70	Hybridization and genetic diversity	Ms. Pungdila Valentina	GPB	2017	Fruit set was maximum in Jawaharlal Brinjal-8 X Brinjal Rajendra Green as well as in DBR-

	studies in brinjal				31 X DRNKV-104 (80 %) where pollen germination was not the highest whereas fruit set was the least (40 %) in Jawaharlal Brinjal-8 X DBR-31 where pollen germination was the highest. Seven RAPD (out of 18) and all 12 SSR primers were selected to assess the genetic diversity of 31 accessions. A total of 35 amplification products were scored in 31 accessions with different primers, out of which 29 were found polymorphic.
71	Response to selection for yield contributing traits in *Brassica campestris*under acidic upland soils	Mr. HiralalDebbarma	GPB	2017	The present investigation was carried out to select superior plants for six yield contributing traits under rainfed, low-input, acidic upland soil condition in M27 background. Based on the important yield contributing traits OP1-12-5, OP2-3-1, OP1 -13-5, OP1-6-1 and OP1-14-5 were identified as superior lines.These lines, after further evaluation and multiplication can constitute an improved M27 population, or can be intermated to form a base population for further selection.
72	Morphological characterization and in vitro regeneration in strawberry (*Fragaria* sp.)	Ms. Chumki Dutta	GPB	2018	Data for seven *Fragaria*genotypes from farmers' fields in Ri-bhoi and East Khasi Hills subjected to ANOVA revealed presence of considerable variation for nineteen quantitative traits especiallythose pertaining to fruit characteristics.*In vitro* regeneration revealed that MS Medium supplemented with 5mg/l BAP + 1mg/l IAA produced the best results both in terms of maximum percentage survival of explants and number of shoots in all the varieties studied.
73	Evaluation of Citronella (*Cymbopogonwinterianus*Jowitt.) genotypes for their oil yield and essential oil content under Meghalaya conditions	Mr. Mallikarjun P. K	GPB	2020	The genotypes Bio-13 and Mandakini were registered as high oil yielding and stable for essential oil yield, whereas JC-4 had higher fresh biomass yield and showed better adaptability for most of the traits. Among the four seasons, Pre-kharif, 2019 (S2) was found to be the better season for most of the traits studied and Rabi, 2019-2020 (S4) was desirable from oil quality point of view as it was observed with higher percent concentration of chemical constituents except Citronellal. Genotypes Jalapallavi, JC-2 and JC-4 were desirable for major essential oil constituents as they had high Citronellal, citronellol and geraniol percent, respectively.The molecular characterization of Citronella genotypes with SSR markers produced a total number of 57 alleles. The highest PIC value of 0.69 was recorded for

					CM007 and lowest value of 0.22 was recorded for CM4142 with an average value of 0.48. The highest similarity was found between the genotypes JC-1, JC-2 and JC-4, while the least similarity was found between genotypes Mandakini and JC-2 as well as between genotypes Bio-13 and JC-1.
74	Evaluation of *Linumusitatissimum* genotypes and F1 hybrids under acidic upland conditions of Meghalaya	Ms. Bezil M.	GPB	2020	Breeding lines LMS 2015- 11 and BAU 15- 03 were identified the mostlow Ptolerant, stable and high yielding genotypes under upland conditions of Meghalaya.
DISCIPLINE: PLANT MOLECULAR BIOLOGY AND BIOTECHNOLOGY (PMB)					
CLASSIFICATION/CATEGORY: GERMPLASM CHARACTERIZATION AND EVALUATION					
75	Screening and characterization of putative mutant population in Brassica for low moisture stress	Ms. Chandrakanthi S	PMB	2016	Reproductive stage low moisture stress screening revealed that M 27 and NRCHB 101 are better performers. Hydroponics screening showed that M 27 had the least amount of MDA suggesting it is more tolerant to low moisture stress. In terms of germination percentage and root length in low moisture conditions during germination, M 27 and TS 38 are good performers.
76	Studies on hybridization between various accessions and genetic diversity in cucumber *(Cucumis sativa)*	Ms. ChongdeilhingKipgen	PMB	2016	Nineteen SSR primers and 10 RAPD primers to assess genetic diversity of 35 accessions of cucumber showed a range of 33 to 100 for Bray-Curtis similarity coefficient with an average value of 65 %. In M-1 X VRCU-03 the highest fruit set (93 %) was recorded which showed 81.32 % pollen germination after 4 hours of pollination. The genotype IIHR-76 was distinct from the rest of the accessions.
CLASSIFICATION/CATEGORY:MOLECULAR MAPPING					
77	Development of microsatellite markers for*Momordicacharantia*and assessment of their cross amplification in some related species	Mr. Raghu Santosh Bhagwan	PMB	2013	22 SSR markers were developed out of which 15 showedpolymorphism.
CLASSIFICATION/CATEGORY:TISSUE CULTURE					
78	Studies on inter-specific hybridization and embryo rescue in tomato	Mr. Herbert P. Kharkongor	PMB	2012	The cross of *S. Iycopersicum* with S. *pimpinellifolium* gave the maximum fruit set followed by the reciprocal cross. Twenty five days after pollination was found to be the optimum stage for rescuing the immature embryos. MS medium supplemented with 1 mg/I GA_3, 0.1 mg/I NAA and 0.5 mg/I BAP gave the highest germination percentage of the

					cultured embryos. Hybridity of the embryo rescued plants was confirmed using RAPD markers viz. OPAB-18 and OPAB-17.
79	Standardization of in vitro regeneration protocol, crossability and genetic diversity studies in bottle gourd (*Lagenariasiceraria* (Mol.) Standal.)	Mr. Santhosh B. L.	PMB	2017	Maximum number of roots (5.6) was recorded in cotyledonary explants (MS + BAP @ 2.0 mg/l + IBA @ 2.0mg/l). Based on 16 polymorphic SSRs, Euclidean distance matrix index analysis revealed that the lowest distance coefficient (0) was found between GH – 37 and GH – 28, whereas GH – 35 and GH – 31 showed the highest (4.12).
80	*In vitro* regeneration and genetic variation analysis using molecular markers in selected banana cultivars of Meghalaya	Ms. FlamiaChimachi R. Marak	PMB	2018	Invitro regeneration protocol on 10 banana genotypes suggested use of MS11 and MS5 combination as the best combinations. The Euclidean distance was the highest between Champa and Atigola.

MASTER"S THESES in HORTICULTURE

Sl. No.	Title of the thesis	Name of the student	Major discipline	Year of passing	Outcome
81	Off season production of strawberry: effect of low tunnel and planting time	Ms. AgreesiaSyndor	Horticulture (Hort)	2009	Low tunnel structures and planting time had a positive effect on the plant growth, fruiting and extension of fruit period, yield and quality. Fruit bearing is 30-35 days earlier than the normal period when planted in 50% shade during the month of July or August and the fruit availability can extend up to 47 days when planted during the month of November under UVS polythene tunnel.
82	Impact of planting time and phosphorous dosage on the productivity of dolichos bean (Lablab purpureus I.) Cv Rcdl-10	Ms. BanyllaKharbamon	HORT	2011	For Dolichos bean (*Lablab purpureus* l.) Cv. Rcdl-10, as compared with late sowing, early sowing in the months of May and June resulted in higher yield and yield attributes, even with low levels of phosphorus applied. Fertilization with phosphorus dose of 60kg/ha produced better results, as compared to the lower phosphorus doses in all aspect.
83	Standardization of plant growth promoting substances and grafting techniques for	Mr. BasuLangpoklakpam	HORT	2011	All pre-sowing seed treatments significantly influenced seed germination and subsequent seedling growth and development process in *Prunus* with GA_3 @ 75 ppm proving to be the best in overall germination behavior. Tongue

	raisinhSohiong (Prunus nepalensis L.) seedling				grafting proved to be the better technique of propagation with respect to days to first sprouting, graft success, sprouting duration, subsequent plant growth characteristics and final survival percentage.
84	Physico-chemical properties of Assam lemon (Citrus limonBurm.) at different stages of fruit growth, development and storage	Mr.Callisthenics Mukhim	HORT	2010	Fruits harvested at 120 to 130 days after fruit set (DAF) developed acceptable physico-chemical qualities with optimum fruit weight (109.28-112.95 g), juice content (37.68-41.23 %), titratable acidity (4.18-4.35%), TSS (≤6.3 ^{0}Brix) and TSS: acidity (≤1.51), and these may be considered as the most reliable maturity indices for taking harvest decision of Assam lemon fruit. The packaging of fruits in perforated (2 pin hole) PP had distinct advantages over control and other packaging materials in respect of shelf life extension besides retention of other quality and nutritional value of the fruits.
85	Yield and antioxidant dynamics in Broccoli (Brassica oleracea var. italic) under different nutrient management regimes	Mr. Lalhminsanga	HORT	2010	Combined application of 50% NPK + 50% Vermicompost + FYM produced the highest broccoli yield (174.45 q ha^{-1}).The highest ascorbic acid, β carotene and total phenol content of head were observed in the treatment combination of organic, inorganic fertilizers and biofertilizers.
86.	Estimation of genetic variability and its implications in improvement of tomato (*Lycopersiconesculentum*Mill.)	Mr. Rajendra Prasad Thapa	HORT	2009	The path coefficient studies on thirty genotypes of tomato revealed that average fruit weight, number of fruits per plant, β - carotene, pericarp thickness, number of locules per fruit, flowers per cluster and number of primary branches per plant exhibited direct effect on yield per plant. Among nineteen characters in thirty genotypes average fruit weight contributed maximum per cent towards genetic divergence followed by juice content.
87.	Physico-chemical changes of Sohshang (*Elaenuslatifolia*L.) at different stages of maturity and storage	Ms. Rikadakini Lamare	HORT	2009	Fruits harvested at 75 to 80 days after fruit set (DAF) developed acceptable physico-chemical qualities with good colour, flavour and texture. Packaging of fruits in non perforated PP had distinct advantages over control and other packaging materials in respect of shelf life extension besides preservation of quality and nutritional value of the fruits.

88.	Changes in antioxidant phytochemicals of turmeric at different stages of harvesting	Mr. Sanyang Sangma	HORT	2010	The highest yield per plant was recorded in the variety Megha Turmeric (692.67 g), the highest harvest index (95.30 %) and moisture content (92.70 %) was recorded from the variety Narendra Haldi while the variety Alleppy Supreme recorded highest (11.80 %) curcumin content.The maximum curing percentage (23.20 %) was observed in Kedaram and the maximum ascorbic acid content (57.87 mg/l00g) was recorded from the variety Kasturi Tanaka and β carotene content was highest (4332.70 mg/100g) in the variety Kedaram.
89	Crop regulation and quality improvement of peach	Mr. Sarangthem Binoi Meitei	HORT	2011	For crop regulation and quality improvement of peach cv. Flordasun hand thinning 70 %, ethrel @ 150 ppm and thiourea 5% and LFR of 30:1 were most effective. Among the hand thinning treatments, 70 % thinning at FB was the most effective where maturity was advanced by 5-6 days, improved fruit size, weight, pulp to stone ratio, TSS, titratable acidity, ascorbic acid, total sugars, fruit colour, total anthocyanins and total phenols.Chemical thinners too, when applied at higher concentration (Ethrel @ 150 ppm) and thiourea @ 5% AFS reduced the crop load and improved the physico-chemical characteristics of fruits. However, all the treatments significantly reduced total yield.

Ph.D. Theses

Sl. No.	Title of the thesis	Name of the student	Major subject	Year of passing	Outcome
1. Rice					
DISCIPLINE GENETICS AND PLANT BREEDING					
CLASSIFICATION/CATEGORY: GERMPLASM CHARACTERIZATION AND EVALUATION					
1	Crossability Embryo rescue and genetic diversity studies in Oryza	Mr. TalomDabi	GPB	2019	Crossability and pollen studies revealed CAUR1 X Shasharang as the best combination among the intervarietal crosses. Among wide crosses, *Pathara* X *Oryza rufipogon* was the best. Genetic diversity study of 43 genotypes using 31 SSRs revealed a total of 113 alleles.
CLASSIFICATION/CATEGORY: ABIOTIC STRESS TOLERANCE					
2	Marker assisted selection of transgressive segregants for high yield under acidic soil conditions	Mr. Shiva Kumar K	GPB	2017	Marker assisted selection for transgressive segregants derived from two different crosses in rice carrying favourable alleles for P deficiency and submergence tolerance under acidic low land soils has yielded high yielding F_4 progenies homozygous for Sub1 locus and showing

					submergence tolerance phenotype. Also high yielding F_4 progenies homozygous for PUP1 locus and showing P deficiency tolerance phenotype were identified based on field and hydroponic evaluation.
CLASSIFICATION/CATEGORY: BIOTIC STRESS TOLERANCE					
3	Genetic Analysis of Leaf and Neck Blast Resistance in Rice	Mr. Ashim Debnath	GPB	2018	Genes/loci *Pi54* , *Pi2*, *Pib*, *Pi2/9* locus, *Pi5*, *Pb1/q*Pbm locus and *Pi20(t)* were associatedwith leaf blast resistance in rice under mid-hill conditions. Genes *Pi5* and *Pi54* were found to be associated with leaf blast resistance in both, natural population and biparental F_2 population. *Pib*and*qPbm* showed some degree of association with neck blast resistance in natural population. The study indicates that leaf and neck blast resistance is primarily governed by dominant alleles of multiple genes that interact with each other to impart resistance.
DISCIPLINE: PLANT MOLECULAR BIOLOGY AND BIOTECHNOLOGY (PMB)					
CLASSIFICATION/CATEGORY:MOLECULAR MAPPING					
4	Identification of novel alleles for acidity tolerance in rice	Ms. Julia S Yumnam	PMB	2015	Rice seedlings screened under low P condition for 15 and 25 days revealed LR 23 and LR 26 as tolerant genotypes. Genotypes like UR 5 and UR 29 were identified as tolerant when screened under 0.54 mM of Al^{3+} for 5 days based on basis of percentage increase in root and shoot biomass. Pot experiment conducted for 25 days for aluminium toxicity tolerance (0.54 mM of Al^{3+}) led to identification of LR 39, LR 56 and LR 13 as tolerant genotypes. Field screening for P deficiency and iron toxicity tolerance identified LR 11, LR 15, LR 18 and LR 26 were tolerant to iron toxicity conditions. Novel alleles for genes reported for low P, aluminium and iron toxicity tolerance identified from NE rice germplasm.
5	Understanding molecular biology of acidity tolerance in rice: A case study of phosphorus deficiency and iron toxicity tolerance in Shahsarang	Mr. Sudip Das	PMB	2016	Genes reported for iron deficiency tolerance can be potential targets for enhancing rice production under P deficiency and iron toxicity field conditions.Maintaining Fe homeostasis under Fe toxicity and P deficiency conditions could be vital to better performance under poor soil conditions.
6	Molecular mapping for low light intensity tolerance in rice	Mr. Suvendhu Sekhar Dutta	PMB	2017	Key traits affected by low light intensity identified as Panicles per plant, Harvest index, Spikelet fertility, grain yield. Tolerant genotypes for low light intensity identified: Megha rice 1, Mahisugandh, Danteshwari, Pusa Sugandh 5.

					Five HvSSR markers associated with low light intensity tolerance identified.
7	Role of *Oryza sativa* G2-like transcription factor family in low P tolerance in acidic soil adapted rice genotypes	Mr. Karma Landup Bhutia	PMB	2019	New members of G2-like transcription factors identified for role in low P tolerance. Chromosome 2 of rice identified as a novel region imparting higher yield under lowland acidic soils.
2. Maize					
DISCIPLINE GENETICS AND PLANT BREEDING					
CLASSIFICATION/CATEGORY: GERMPLASM CHARACTERIZATION AND EVALUATION					
8	Divergence and Combining Ability Studies in a Set of Inbreds Developed from Maize Landraces of North Eastern Hill (NEH)	Mr. Naveen Kumar	GPB	2019	A total of 111 lines developed from seven different landraces employing full sib-mating from generations one to four and selfing in generations five and six respectively were studied for heterotic grouping. Model and distance-based clustering approaches combined with the presence of phenotypic variability in the lines for yield traits followed by a preliminary partial diallel analysis indicated the existence of distinct heterotic groups for landraces of North East India.
3. Others					
DISCIPLINE GENETICS AND PLANT BREEDING					
CLASSIFICATION/CATEGORY: GERMPLASM CHARACTERIZATION AND EVALUATION					
9	Evaluation of lentil (*Lens culinaris* ssp. *CulinarisMedikus*) germplasm under low-input acidic soil conditions of North East India	Mr. Sapam Rajesh Kumar Singh	GPB	2017	A set of 150 evaluated under upland acidic conditions and crossing between contrasting genotypes attempted. IPL-325, PL-04, LRIC 560812, IPL-322, PL-117, SKUAL-2-96, PL-4 and PL-101 were found to be performing best under the conditions with respect to pod yield, root and shoot biomass.
DISCIPLINE: PLANT MOLECULAR BIOLOGY AND BIOTECHNOLOGY (PMB)					
CLASSIFICATION/CATEGORY: GERMPLASM CHARACTERIZATION AND EVALUATION					
10	Crossability, embryo rescue and genetic diversity studies using molecular markers in cultivated soybean and its wild relatives	Mr. Billy Cherian	PMB	2019	Genetic diversity revealed two distinct clusters. Polymorphic information value ranged from 0.3119-0.6836. *Glycine soja*was successfully crossed with Bargg, Kalitur and Alankar and hybridity proved with marker Satt396.
CLASSIFICATION/CATEGORY:MOLECULAR MAPPING					
11	Isolation and characterization of tissue-specific promoter from pigeon pea	Mr. Satish Kumar Verma	PMB	2017	Two transcripts, 00220 and 11572 were identified as seed specific pigeon pea transcripts. While 00220 belongs to MADS transcription family, 11572 belongs to TALE transcription family. TAIL PCR approach led to identification of 228 bp 5' UTR (untranslated region) of 00220

					transcript. Upon sequencing of final tertiary PCR product and subsequent analysed using PlantCARE database revealed presence of different motifs such as ARE motif, three CAAT-box, G-box, GT1-box, two Skn-1, three TATA-box and three unnamed motifs 1, 3 and 4.

SCHOOL OF CROP PROTECTION

M.Sc. Crop Protection (Entomology)					
Sl. No.	**Title of the Thesis**	**Name of the student**	**Major subject**	**Year of completion**	**Outcome (2-3 lines)**
DISCIPLINE: CROP PROTECTION					
CLASSIFICATION/ CATEGORY: ENTOMOLOGY					
1.	Eco-biology and management of citrus leaf miner, *Phyllocnistis citrella* (Stainton) in Meghalaya.	Mr. Shembha Syngkon	Entomology	2009	• Citrus Leaf miner, *Phyllocnistis citrella* life cycle ranged from 11-36 days with an average of 20.50 days with highest infestation in the third week of February. • Among the insecticides evaluated, Imidacloprid (0.05%) was found most effective against this pest on Citrus.
2.	Studies on the Biology of *Callosobruchus chinensis* (Linnaeus) on different pulses and its management at medium altitude hills of Meghalaya.	Mr. Jash Paul Debbarma	-do-	2010	• Pulse beetle, *Callosobruchus chinensis* was recorded as most serious pest in stored pulses. • Among different botanicals tested against the pest, neem leaf powder @ 50 g/kg seed followed by neem oil @ 10 ml/kg were found most effective.
3.	Insect Pest Complex of okra and their management at medium altitude hills in Meghalaya.	Mr. Kitdorlang Kharpran	-do-	2010	• Among the insect pests recorded on Okra, Blister beetle, *Mylabris postulate* was recorded as major pest. • Among the insecticides tested, Imidacloprid (0.004%) was found most effective in controlling the major pest.
4.	Population dynamics of lepidopteran pests in Cabbage and bio-	Ms. Ridalang W. Rangad	-do-	2010	• Among the insect pests, recorded on Cabbage, Cabbage butterfly, *Pieris brassicae* was recorded as a major

	efficacy of eco-friendly insecticides against *Pieris brassicae* (L.).				pest. • Among the insecticides evaluated, botanicals and microbial insecticides, Endosulfan, Annonin and *Beuveria bassiana* were found most effective in controlling the pest, respectively.
5.	Insect pest complex of brinjal and management of *Leucinodes orbonalis* at mid hills of Meghalaya.	Ms. Pukhram Bhumita	-do-	2010	• Among ten insect pests recorded on brinjal, shoot and fruit borer was observed as the major pest. • Among the insecticides evaluated against the shoot and fruit borer, Pheromone trap (Luci lure) @ 100 traps/ha followed by spray of Endosufan @ 0.07% were found most effective in reducing the pest population.
6.	Study on fruit flies of mid altitude hills of Meghalaya.	Ms. Bakordalin Chyne	-do-	2010	• Among the fruit flies recorded, *Bactrocera tau* was the most common pest on cucurbits and *B. dorsalis* on fruit crops. • The total life cycle of *B. tau* ranged from 30-40 days which could be controlled by parapheromone *viz.* Methyl eugenol.
7.	Seasonal incidence of mustard aphid, *Lipaphis erysimi* (Kaltembach) and associated natural enemies on mustard crop.	Ms. Karma Doma Bhutia	-do-	2011	• Mustard aphid, *Lipaphis erysimi* had highest incidence during last week of December and disappeared in 2nd week of February. • Among the natural enemies, Lady bird beetle, *Coccinella septumpunctata* was observed very potential predator consuming highest number of aphids.
8.	Studies on biology of maize weevil, S*itophilus zeamais* (Mostch.) and its ecofriendly management in mid altitude hills of	Ms. Rumki Heloise Ch. Sangma	-do-	2011	• Maize weevil, S*itophilus zeamais* completed life cycle in 38-45 days with a mean of 40 days in stored maize grains. • Among the botanical leaf powders and botanical oils, neem oil @ 3.0 ml/kg grain was found most effective

	Meghalaya.				in controlling the pest under storage conditions.
9.	Biological attributes of Cabbage butterfly, *Pieris brassicae* (L.) and its natural in mid-altitudes of Meghalaya.	Mr. Damitre Lytan	-do-	2012	• It was recorded that the most important attribute of Cabbage butter fly, *Pieris brassicae* was to lay eggs under lower surface for both oviposition and pupation to avoid predation by its natural enemies. • Among the natural enemies, larval pupal parasitoids *H. ebninus* was recorded as the major natural enemy in suppressing the pest population.
10.	Studies on seasonal activity and management of white grubs on Groundnut.	Ms. Devina Seram	-do-	2012	• The seasonal activity of adult white grub, *Leucopholis coneophora* was observed maximum during the last week of July to first week of September. • Among the management practices viz., seed treatment with Imidacloprid @ 3.0 ml/kg followed by soil drenching with Chlorpyriphos @ 4.0 l/ha were found most effective in controlling the pest in groundnut.
11.	Ecological aspects related to biological control of cabbage butterfly, *Pieris brassicae* (L.) (Lepidoptera: Pieridae) in Meghalaya.	Ms. Meena Debbarma	-do-	2012	• Among the natural enemies of cabbage butterfly, Ichneumonid wasp *Hyposoter ebeninus* was recorded as predominant parasite which could be used for its successful management.
12.	Insect pest complex and eco-friendly management of major insect pests of maize at medium altitude hills of Meghalaya.	Mr. Deebune Shilla Lamare	-do-	2012	• Among the insect pest recorded on maize, stem borer, *Chilo partellus* was observed as a major pest. • Among the insecticide evaluated against stem borer, Imidacloprid @ 0.25 ml/l was found most effective in controlling the pest.
13.	Eco-biology of tomato fruit borer, *Helicoverpa armigera*	Mr. David Nonglait	-do-	2012	• The life cycle of tomato fruit borer, *Helicoverpa armigera* was recorded 42-61 days on artificial diet whereas

	(Hubner) and its management.				it was higher on natural diet with 42-66 days. • Among the insecticides evaluated endosulfan @ 0.07% was found most effective in controlling the pest.
14.	Insect pests complex of soybean and their eco-friendly management in mid hills of Meghalaya.	Mr. CNJS Arangba Mangang	-do-	2012	• A total of six insect pest species of which, stem fly, *Ophiomyia phaseoli* was recorded as major pest on Soybean crop with highest infestation of 50.60% in first week of August. • Among the synthetic insecticides evaluated endosulfan @ 2.0 ml/l was found most effective in controlling the major pest.
15.	Effects of different pesticides on Major Parasitoids of Cabbage Butterfly, *Pieris brassicae* (L.).	Mr. Deimonlangki P. Thubru	-do-	2013	• It was observed that among the four conventional insecticides evaluated against parasitoids of Cabbage Butterfly, *Pieris brassicae*, deltamethrin was found most deleterious and *Bt var. K* was found safest.
16.	Population Dynamics and Management of Mustard Aphid (*Lipaphis erysimi* Kaltenbach) in Meghalaya.	Ms. Tongbram Rojina Devi	-do-	2013	• Mustard Aphid, *Lipaphis erysimi* population was recorded highest during the 12^{th} week after sowing i.e. 3^{rd} week of January. • Among the nine insecticides evaluated against the mustard aphid, Profenofos @ 5.0 ml/l was found most effective in controlling the pest.
17.	Studies on Biology and in *Vitro* Efficacy of Pesticides against Diamonback Moth, *Plutella xylostella* (L.).	Mr. Pritin Pramod Sontakke	-do-	2013	• The biology of Diamond back Moth, *Plutella xylostella* studied on different cruciferous crops revealed that the total developmental period was longest on Cabbage (20.2 ± 0.66 days) and shortest on Brocolli (13.0 ± 0.45 days). • Toxicological studies showed that botanical (Anosom) was most effective at LC_{50} of 0.1 ppm against pest.

18.	Biology and Control of Tomato Leaf Miner (*Liriomyza trifolii*) in Meghalaya.	Ms. Supriya Okram	-do-	2013	• The life cycle of Tomato leaf miner, *Liriomyza trifolii* ranged from 13-23 days. • Evaluation of different insecticides indicated Phosphamidon 22.44% as most effective against the pest.
19.	Studies on pest complex and efficacy of botanicals against major pest of oyster mushroom in Meghalaya.	Ms. Badarikynti Nongkynrih	-do-	2014	• Among the nine insect pests recorded on Oyster mushroom, Sciarid fly, *Bradysia* spp. and the fungus beetle, *Triplax* spp. were found major pests. • Among the biopesticides and botanicals evaluated, ethanol extracts of *Zanthoxylum armatum* was found most effective against the major pests.
20.	Insect pest complex of ginger in Meghalaya and their eco-friendly management.	Ms. Grikchi Ch. Momin	-do-	2014	• Among the seven insect pest recorded on ginger, rhizome weevil and shoot borer were recorded as major pests. • Among the eco friendly pesticides evaluated, rhizome treatment with Imidacloprid + Ridomil MZ followed by application of *Metarrhizium anisopliae* ($2x10^6$ cfu/ml) were found most effective against the major pests.
21.	Genetics of Indoxacarb resistance in *Plutella xylostelia* (Diamond back moth).	Mr. Romeo M. Marak	-do-	2014	• Studies on resistance to Diamond back moth, *Plutella xylostelia* showed that Indoxacarb is autosomal and is inherited as semi dominant trait which could increase the rate of resistance in DBM. • Therefore some lethal doses and frequent use of Indoxacarb should be avoided for control of DBM.
22.	Evaluation of different artificial diets for laboratory rearing of *Coccinella septempunctata* L. (Coleoptera:	Mr. Vinayak B. Doddamani	-do-	2014	• Of 21 artificial diets evaluated for rearing predatory lady bird beetle, *Coccinella septempunctata*, cat food based artificial diet was found the best for rearing the predator

	Coccinellidae).				
23.	Molecular Characterization of Fruit Fly Species of the Genus *Bactrocera* in Mid Altitudes of Meghalaya.	Ms. Arpana Manger	-do-	2015	• Diagnostic keys were developed for 10 species of *Bactrocera* which would be useful for their identification. • Sequence length polymorphisms detected at ITS I and micro satellite loci would be used for the development of PCR based molecular diagnostic markers.
24.	Studies on Biological and Ecological Attributes of Major Natural Enemies of Mustard Aphid, *Lipaphis erysimi* (Kalt.)	Ms. Nang Sena Manpoong	-do-	2015	• Of three groups of potential natural enemies of mustard aphid, Coccinellids i.e. Lady bird beetle, *Coccinella septumpunctatta* was found most dominant natural enemy of this pest.
25.	Study on Diversity of Pollinators in Cucurbits and Pollination Biology of Honey Bee in Chow-Chow (*Sechium edule*) at Mid-Hills of Meghalaya.	Mr. Ripan Debbarma	-do-	2015	• Among the diversity of pollinators India Honey bee *Apis cerena indica* was found most efficient pollinator on Chow-Chow, bottle gourd and pumpkin. • It is recommended that honey bee hives may be installed in the Chow-Chow fields so as to increase the yield as well as the honey production.
26.	Development of DNA Barcodes for Major Insect Pests and Natural Enemies of Cole Crops Ecosystem in Mid-Altitude of Meghalaya.	Ms. R. Lalrinfeli	-do-	2015	• A total of 29 insect species (Pest + Natural enemies) were documented in Cole crop ecosystem. • All the 29 DNA barcodes were developed for all the insect species.
27.	Studies on Biology and *In Vitro* Efficacy of Different Pesticides against Major Lepidopteran Pests of Cole Crops.	Ms. V. Lalnunpuii	-do-	2015	• Studies on preferential crop host, i.e. cabbage, cauliflower and knol khol of Tobacoo caterpillar, *Spodoptera litura* and Cabbage butterfly, *Peris brassicae* showed that these pests have longer developmental period on cabbage than other two crops.

					• Bio efficacy studies against these pests showed that, Spinosad 45% was most effective in controlling these pests.
28.	Development of DNA Barcodes of Insect Pests and Natural Enemies of Major Cereal Crops in Mid Hills of Meghalaya.	Mr. Khrieketou Kuotsu	-do-	2016	• A comprehensive molecular data was developed for a total of 30 insect species infesting rice and maize. • This data could be used as a diagnostic guide at both morphological and molecular level which will be helpful in developing pest management strategies.
29.	Eco-friendly Management of Major Insect Pest of Tomato in Mid-Hills of Meghalaya.	Ms. K. Lalruatsangi	-do-	2016	• Among the chemical insecticides, microbials and botanicals, Flubendiamide, Azadirachtin and *Bacillus thurengenisis* were found most effective in controlling the major pest of tomato, respectively.
30.	Ecological Aspects and Management of Fruit Infesting Tephritids in Guava (*Psidium guajava* L.).	Mr. Pitchaimuruga n M	-do-	2016	• Ecological studies of fruit flies, *Betrocera dorsalis* could be managed by topical sprays of neem oil and soil incorporation of entomopathogenic fungus *Metarrhizium anisopliae*.
31.	Pollination Biology of Honey Bee in Chow-chow (*Sechium edule* Jacquez) and its Impact on Yield at Mid Hills of Meghalaya.	Mr. Remiioo Newyear Bamon	-do-	2016	• Studies on pollination biology showed that Indian honey bee is a predominant pollinator of Chow-chow with highest foraging in the month of August. • The effect of pollination of Indian honey bee showed increase in yield of 15.48 kg/plant as compared to 12.3 kg/plant in non pollinated plants.
32.	Seasonal Incidence and Bio-rational Management of Shoot and Fruit borer (*Leucinodes orbonalis* Guenee) of Brinjal in Mid-Hills of Meghalaya.	Mr. Ajit Tripura	-do-	2016	• Seasonal incidence studies of Brinjal Shoot and Fruit borer showed that the severity of damage could be avoided by planting the crop in the month of April. • Among the insecticides evaluated, Chlorantraniliprole was found most effective in controlling the pest in

					brinjal ecosystem.
33.	Screening of Germplasms and Evaluation of Botanicals Against Mustard Aphid, *Lipaphis erysimi* (Kaltenbach) in Mustard in Mid Hills of Meghalaya.	Mr. Partha Debnath	-do-	2016	• Out of twenty germplasms of Mustard, eight were found highly susceptible and rests were found moderately susceptible. • Among the botanicals tested, *Melia azedarach* was found most effective in controlling Mustard Aphid, *Lipaphis erysimi*.
34.	Insecticidal Activities of *Zanthoxylum armatum* Extract Against Major lepidopteran Defoliators of Vegetables.	Mr. Kaleeswaran G.	-do-	2017	• Studies on insecticidal properties of *Zanthoxylum armatum* showed that n-hexane fraction of its extract have lethal and sub lethal action with strong anti feedant and ovicidal effect against vegetable defoliators. • The extract will be useful in management of major pests of vegetables under organic farming as well as in insecticide management programmes.
35.	Studies on Aphidophagous Coccinellids of Cowpea Ecosystem in Mid Hills of Meghalaya.	Ms. Lency Tangu	-do-	2017	• Among the several Aphidophagous Coccinellids, *Coccinella septumpunctata*, *C. transversalis* and *Chilomenes sexmaculatus* were found dominant predators of Cowpea Aphids, *Aphis crassivora*.
36.	Studies on Bio-Efficacy, Persistency and Non-Target Toxicity of Chlorfenapyr and Indoxacarb in Brinjal and Cabbage.	Mr. Sakil Dhamala	-do-	2017	• Among the insecticides evaluated, Indoxacarb was found most effective against brinjal shoot and fruit borer and cabbage butterfly. • Studies on dissipation and non target insects revealed that Indoxacarb was least persistent and safe to natural enemies.
37.	Development of DNA Barcodes for Major Insect Pests and Natural Enemies of Solanaceous Crops	Mr. Sankarganesh E	-do-	2017	• A total of 52 insect species were recorded in Solanaceous crop ecosystem. • A comprehensive molecular data was developed which could be used as a

	Ecosystem in Mid Hills of Meghalaya.				diagnostic guide at both morphological and molecular level which will help in developing pest management strategies.
39.	Studies on major Soil Borne Insect Pest and Parasitic Nematodes Affecting Potato Crop and Their Management.	Sh. Along Bryan M. Sangma	-do-	2017	• Among the soil insect pests recorded, white grubs and cutworms were found major pests in potato ecosystem. • Plant parasitic nematodes were also recorded in potato ecosystem which could be managed by using *Crotalaria* as cover crop to control the nematode pest.
40.	Development of DNA Barcodes for Major Insect Pests and Natural Enemies of Cucurbitaceous Crops in Mid Hills of Meghalaya.	Ms. Arensungla Pongen	-do-	2018	• DNA barcodes generated for 33 insect species in cucurbitaceous crop ecosystem. Of which 23 insect species were established up to species level and 10 upto genus level. • Reported 3 species *viz*., *Maculus* sp., *Paridea* sp. and *Coridius* sp. were established for the first time.
41.	Bioefficacy and Dissipation of Imidacloprid and Thiacloprid in/on Chilli (*Capsicum annuum* L.).	Ms. Baiamon Sutnga	-do-	2018	• Among the six insecticides evaluated against sucking insect pest of Chilli, Imidacloprid @ 50g a.i./ha was found most effective in controlling the pest. • Dissipation studies of the insecticides revealed that the waiting period of Imidacloprid was 4.2 days which is safe for consumption of chillies.
42.	Assessment of Toxicity of Bio-pesticides to the Indian Honey Bee, *Apis cerana indica* (Fabricius) in Oilseed Brassica.	Mr. Challa Girish Kumar	-do-	2018	• Biopesticides *viz*., azadirachtin, annonin, *Bt* var *kurstaki*, *Beauveria bassiana*, *N. rileyi* were found to be safe for foraging bees except spinosad. • *N. rileyi* was found to be selective and absolutely harmless to the foraging bees.
43.	Effect of Plant Extracts and Essential Oils on Major Lepidopteran	Ms. Pebam Inija Devi	-do-	2018	• Among plant extracts tested, n-hexane fraction of Vitex negundo was most effective against *Spodoptera*

	Pests of Cruciferous Crops.				*litura, Pieris brassicae* and *Plutella xylostella* • Among essential oil, Ocimum basilicum was found most effective.
44.	Studies on Various Histological Changes in Haemocytes Associated with NPV Infection in *Helicoverpa armigera* Hübner).	Mr. Yengkhom Suraj Singh.	-do-	2018	• Dietary effect on *Helicoverpa armigera* biology revealed that chickpea based diet showed highest fitness index followed by pea. • DHC showed six identified cells and four unidentified cells whereas, THC showed effects of NPV are more in younger than older larvae.
45.	Effect of Different Temperatures and Plant Oils on Bruchid, *Callosobruchus maculatus* (Fab.) and Curculionid, *Sitophilus zeamais* (Mots.).	Ms. Balguri Lavanya Sravani	-do-	2018	• Among eight plant oils tested, rosemary and peppermint oil exhibited highest percent adult mortality of *Callosobruchus maculatus* and *Sitophilus zeamais*. • Increase in temperature caused higher build up and greater population dynamics in stored grain pests.
46.	Insect Biodiversity and Seasonal Incidence of Major Insect Pests of Apple (*Malus sylvestris* Mill.) in Mid Hills of Meghalaya.	Mr. Debanand Biswas	-do-	2019	• Seasonal incidence studies showed presence of five insect pests *viz*., green apple aphid, pale tussock moth, tussock moth, giant looper and cocoa tussock moth attacking apple plantation. • Mean population of green apple aphid, pale tussock moth and cocoa tussock moth was significantly correlated with maximum and minimum temperature.
47.	Investigation on Role of Insect and Nematode Pests for Decline of Khasi Mandarin in East and West Khasi Hills Districts of Meghalaya.	Mr. Krishna Kumar. S.	-do-	2019	• Citrus leaf minor and mite attacks were recorded all the year round. • Five plant parasitic nematodes were recorded in Khasi mandarin among them, *Xiphinema* and *Tylenchulus* was the most common.
48.	Insect Biodiversity and Seasonal Abundance of	Mr. Penumajji Ganesh	-do-	2019	• Recoded 95 insect species belonging to 13 insect orders and 51 families in

	Major Insect Pests of Black Gram (*Vigna mungo* L. Hepper) Ecosystem in Mid-Hills of Meghalaya.	Kumar			black gram ecosystem.. • Bean stemfly, spotted pod borer and bean aphid were recorded as key pests in black gram ecosystem.
49.	Arthropod Diversity in Rice Ecosystem with Special Reference to Spiders in Mid-hills of Meghalaya.	Ms. Sonali Nakambam	-do-	2019	• A total of 1640 arthropod species belonging to 2 classes *viz*., Arachnida and Insecta were recorded in rice ecosystem. • Spider *Lycosa* sp. Was recorded the most abundant species while *Oxyopes bharatae* and *Pardosa sumatrana* were found in all the growth stages of rice crop.
50.	Insect Biodiversity and Seasonal Incidence of Major Insect Pests in Wheat (*Triticum aestivum* L.) Ecosystem in Mid-hills of Meghalaya.	Mr. Wankitkupar Fernando Nadon	-do-	2019	• Among the insect pest, wheat aphid, *Rhopalosiphum padi* and *Sitobion avenae* was found to be major pest throughout the cropping season • Correlation analysis showed significant difference with minimum temperature and RH with *Rhopalosiphum padi* and *Sitobion avenae* multiplication.
51.	Arthropod Diversity in Agricultural, Horticultural and Silvicultural Ecosystems with Special Reference to Spiders in Mid-Hills of Meghalaya.	Mr. Jyotim Gogoi	-do-	2020	• A total 4023 arthropods were collected from silvicultural, horticultural and agricultural ecosystem, of which 727 Nos. of hexapod and 3296 Nos. of arachnids. • Beta diversity indicated that the maximum richness was found in Silvicultural ecosystem followed by horticultural, rice, maize and potato ecosystem.
52.	Studies on Population Dynamics and Monitoring Insect Pests in Potato Agro-Ecosystem Through Different Pheromone Traps and Lures in the	Mr. Nitin Hugar	-do-	2020	• Five insects' *viz*., *Myzus persicae*, *Empoasca fabae*, *Bemisia tabaci*, *Henosepilachna vigintioctopunctata* and *Thysanoplusia orichalcea* were found as major pests exhibiting peak infestation on potato crop. • The activity of insects was positively

	State of Meghalaya.				correlated with maximum and minimum temperature.
53.	Study on Biodiversity of Soil Arthopods in Mid-Hills of Meghalaya.	Ms. Deepika Gadaily	-do-	2020	• Biodiversity indices depicted that there was no significant difference in species richness and evenness in both ecosystems (Horticulture & Agriculture). • Soil arthropod showed positive correlation with both maximum and minimum temperature in horticultural ecosystem. Whereas, in agricultural ecosystem, positive correlation was recorded with maximum temperature.
54.	Diversity and Morphometric Study of Termites in Mid-hills of Meghalaya.	Mr. Harish R.	-do-	2020	• A total of 10 species were identified of which 3 **new** species *viz*., *Odontotermes parvidens, Odontotermes hainanensis* and *Pseudocapritermes tikaderi* were recorded from Meghalaya. • Genus *Odontotermes* was the most diverse genus with maximum number of species. • *Odontotermes parvidens* showed maximum damage in both forest ecosystem and horticultural ecosystem; *Microtermes obesi* showed maximum damage in maize ecosystem
55.	Spatial and Temporal Distribution of Stingless bees in Mid Hills of Meghalaya.	Mr. T. Narendrakumar	-do-	2020	• A total of 3 species of stingless bees were collected *viz.*, *Tetragonula* sp., *Tetragonula* sp. & *Lepidotrigona arcifera* of which Genus *Tetragonula* was the most diverse system. • Species richness was observed maximum in the month of September and minimum in December.
56.	Dietary influence on the biology and susceptibility of fall armyworm,	Mr. Karthik. R	-do-	2020	• Lab experiment conducted with four artificial diets *viz.*, Beans, Soya meal, Potato and Corn; bean (0.9525) and corn (0.8789) based diets showed

	Spodoptera frugiperda (J.E. Smith) to Cry toxins from *Bacillus thuringiensis*.				better results by having good fitness index, as compared to Soya meal (0.6575) and Potato (0.48109) based diets. • Bioassay with cry toxins showed high mortality rate (based on LC_{50}) in Cry1Ab as compared to Cry1Ac • A new parasitoid, *Cotesia rufricus* on fall armyworm, *Spodoptera frugiperda* was identified for the first time from the region.
57.	Biodiversity and Molecular Characterization of Insect Pests and natural Enemies of Potato ecosystem in Mid-Hills of Meghalaya.	Ms. A. Mounika	-do-	2020	• A total of 48 insect species and one non insect (31 insect pests; 14 Natural Enemies and 4 visitors) were recorded in potato ecosystem. • Comprehensive molecular data were generated for 26 insect pests.

M.Sc. (PLANT PATHOLOGY)					
Sl. No.	**Title of the Thesis**	**Name of the student**	**Major subject**	**Year of completion**	**Outcome (2-3 lines)**
DISCIPLINE: CROP PROTECTION					
CLASSIFICATION/ CATEGORY: PLANT PATHOLOGY					
1.	Eco-friendly management of late blight (*Phytophthora infestans*, (Mont.) de Bary) of tomato in mid-hill conditions of Meghalaya.	Ms. Mariana Dkhar	Plant Pathology	2009	• The new organic formulation MATW-2 (native botanical consisting, Asafoetida, Turmeric and Water) was found effective against late blight of tomato (*Phytophthora infestans*).
2.	Survey and management of Post harvest diseases of Khasi Mandarin (*Citrus reticulate* Blanco)	Mr. Kamalendra Barman	-do-	2010	• *Penicillium brevicompactum* was identified as one of the important fungi to be associated with post harvest disease of Khasi mandarin. • The water extract of Holy basil was found to be the most effective amongst

	in Meghalaya.				the botanicals tested for controlling *Penicillium brevicompactum*.
3.	Etiology and management of pod blight complex of soybean in Meghalaya.	Mr. Tilling Tabyo	-do-	2010	• Five genotypes of soybean viz., MACS 1184, MAUS 417, MACS 1188, DS 2614 and DSB 12 were found moderately resistant to pod blight (*Collectrotrichum truncatum*) and four genotypes viz., MACS 1188, TS 2, AMS 1 and JS 335 were grouped under tolerant category.
4.	Management of early blight (*Alternaria solani*) of tomato in mid-hill conditions of Meghalaya.	Ms. Iterekha R. Marak	-do-	2011	• The genotypes MT-1 and BT-106 were found moderately resistant to of early blight of tomato (*Alternaria solani*) and showed better yield under field conditions.
5.	Characterization of fluorescent Pseudomonads and their evaluation against *Ralstonia solanacearum* (Smith) Yabuuchi under Meghalaya condition.	Ms. Thalhun Lhingkhanthem Kipgen	-do-	2011	• *Pseudomonas flourescens* isolate F. Pd19 was found effective against *Ralsotonia solanacearum*, the bacterial wilt pathogen of solanaceous vegetable crops *in vitro* conditions.
6.	Management of Soybean collar rot caused by *Sclerotium rolfsii* Sacc. under mid hill conditions of Meghalaya.	Mr. Ajit Debbarma	-do-	2011	• *Pseudomonas putida* and *Trichoderma viride* were found the most promising bio-control agents against collar rot pathogen, *Sclerotium rolfsai*. • Garlic extract was the most effective botanical against *S. rolfsai in vitro* conditions.
7.	Studies on bud rot (*Phytophthora palmivora*) of arecanut and its management through eco-friendly methods in Meghalaya.	Ms. Domesticity Lyngdoh	-do-	2011	• Garlic and Duranta extracts were found effective at 5% and 10% concentration, respectively against bud rot of arecanut pathogen, *Phytophthora palmivora* in-vitro conditions.
8.	Etiology of post-	Mr.	-do-	2012	• Acetic acid, Strerptocycline and Datura

	harvest bacterial soft rot of King Chilli and its management.	Albertson L. War			leaf extract in different combinations were the promising treatments against bacterial soft rot of king chilli.
9.	Management of turmeric leaf spot, *Colletotrichum capsici* (Syd.) Butler and Bisby under *in-vitro* condition.	Ms. Binalata Kangjam	-do-	2012	• Garlic clove extract, *Trichoderma harzianum, T. viride* and *Psuedomonas fluorescens* as well as fungicides *viz.*, Sixer, Tilt and Avone were found highly effective against turmeric leaf spot pathogen, *Colletotrichum capsici* under *in vitro* condition.
10.	Evaluation of native fluorescent pseudomonads against wilt pathogens of major vegetables in Meghalaya.	Ms. Kongbrailatpam Jina Devi	-do-	2012	• *Pseudomonas fluorescens* and *P. putida* were identified as the dominant fluorescent pseudomonads associated with different crop rhizosphere. • MRN 18, PC and USR 9.2 were the potential isolates against the wilt pathogens of vegetables *in vitro* conditions.
11.	Eco-friendly management of turicum leaf blight (*Exserohilum turcicum*) of maize in mid-hill conditions of Meghalaya.	Mr. Lourembam Sanjaoba Singh	-do-	2012	• Biocontrol agent *Trichoderma harzianum* was found effective in controlling Turicum leaf blight (*Exserohilum turcicum*) of maize next to fungicide treatment.
12.	Characterization of *Ralstonia Solanacearum* (Smith) Yabuuchi *et. Al.*, Isolates from Meghalaya and its Management in Tomato.	Ms. Janshame Tariang	-do-	2013	• Two fluorescent pseudomonad strains *viz.*, USR 9.2 and PC were found highly effective against bacterial wilt of solanaceous vegetables under field conditions.
13.	Management of Cabbage Leaf Spot, *Alternaria* spp. Under Mid Hill Conditions of	Ms. Kanchanbala Thangjam	-do-	2013	• Biocontrol agent *Trichoderma viridae*, neem leaf extract and fungicide propiconazole were found effective against Cabbage leaf spot caused by *Alternaria brassicicola* under field

	Meghalaya.				conditions.
14.	Ecofriendly Management of French Bean Anthracnose (*Colletotrichum lindemuthianum*) under Mid Hill Conditions of Meghalaya.	Ms. Nirmala Maibam	-do-	2013	• Three French bean genotypes *viz*., Rajma Gold, ML-D and ML-F were found moderately resistant to anthracnose disease.
15.	Management of French Bean Rust (*Uromyces appendiculatus*) using Biocontrol Agents.	Ms. Supriya Laishram	-do-	2013	• French Bean genotypes *viz*., Arka Anoop and Selection-3 were found highly resistant to rust (*Uromyces appendiculatus*) under field conditions.
16.	Management of sheath rot {*Sarocladium oryzae* (Sawada) Gams and Hawksworth} in rice under *in vitro* condition.	Ms. Thongbam Omega	-do-	2014	*Trichoderma viridae*, neem leaf extract and the systemic fungicides *viz*., Carbendazim, Hexaconazol, Tebuconazole and Propiconazole at 0.1 % concentration were found effective against sheath rot of rice pathogen, *Sarocladium oryzae in vitro* conditions.
17.	Etiology of ginger rhizome rot complex in mid-hills of Meghalaya and its management.	Ms. Chanda Poudyal	-do-	2014	• *Allium sativum* (at lower conc.), Lantana camara, *Trichoderma harzianum*, *Pseudomonas fluorescens* and copper oxychloride were found effective against ginger rhizome rot pathogen *in vitro* conditions.
18.	Management of grain discolouration complex in rice.	Ms. Ibakorlang Suting	-do-	2014	• *Sarocladium oryzae*, *Fusarium moniliforme* and *Bipolaris oryzae* were the three dominant fungal pathogens associated with grain discolouration of rice.
19.	Studies on *Ascochyta* Blight of Beans.	Ms. Hissay Lhamu Lepcha	-do-	2015	• Lima bean (*Phaseolus lunatus*) was found highly resistant to Ascochyta blight with 0% PDI. Whereas the four genotypes of French bean VIZ., RCMFB 75, RCMFB 61, RCMFB 62 and

					Selection 9 were found moderately resistant.
20.	Variability Studies of Pathogenic *Alternaria* spp. On Cruciferous Crops.	Ms. Iadariti Kharumnuid	-do-	2015	• Isolates of *Alternaria* spp. collected from different crucifers showed high variability in cultural, morphological and pathogenic chararacteristics. • Isolates collected were found mostly belonging to *A. brassicicola*, after confirmation using molecular techniques.
21.	Influence of Soil Factors on *Rhizoctonia solani* in Meghalaya.	Mr. Kadiri Mahendra	-do-	2015	• Most of the *Rhizoctonia solani* isolates causing diseases in rice and maize belonged to AG 1-IA based on the identification using specific primers.
22.	Characterization and Evaluation of Rhizospheric Bacillus spp. From Jhum Cycles against Major Crop Pathogens.	Mr. Paodumai Seisou Khozii	-do-	2015	• Isolates COB15Y4 (*Bacillus pumillus*) and RB5Y1 (*B. cereus*) showed better performance with respect to bio-control potential as well as PGP attributes of the respective crops against soil borne pathogens of Jhum crops.
23.	Distribution Pattern and Molecular Variability of Banana Bunchy Top Virus (BBTV) in Tripura.	Mr. Tanmoy Das	-do-	2015	• The comparison of Tripura isolates of BBTV among the Districts and within each district indicated nucleotide variation in DNA R in case of isolates from North Tripura and Khowai.
24.	Host - Pathogen Resistance in *Phomopsis* Fruit Rot of Brinjal in Meghalaya.	Mr. Gurumayum Robert Daniel	-do-	2016	• Only one brinjal genotype, 12/BRBWRES-3, was found as moderately resistant to Fruit Rot causing pathogen *Phomopsis vexans* under pot conditions.
25.	Characterization of *Papaya ring spot virus* Pathotype P from Mid-Hills of Meghalaya.	Mr. Korla Saratbabu	-do-	2016	• Biological and molecular characterization of PRSV -P isolate from mid hills of Meghalaya (PRSV –P: Umiam) showed similarity with previously reported PRSV isolates from India.
26.	Evaluation of Antagonistic Potential of Native	Ms. Lopi Rebi Kojum	-do-	2016	• *Trichoderma* isolates TL 3.2 and TL 3.8 were found best in respect to biocontrol potential, functional attributes and

	Trichoderma spp. Against Major Soil Borne Pathogens.				efficacy in field condition for managing soil borne fungal pathogens of tomato.
27.	Pathogenicity of *Rhizoctonia solani* Kuhn on Major Weeds Prevalent in Rice and Maize Ecosystem in Meghalaya.	Ms. R. Saveinai	-do-	2016	• *Rhizoctonia solani* isolate of rice (SRS) was found pathogenic on all the lowland rice and upland weeds. Whereas, maize isolates (RSM 2) was not pathogenic on *Cyperus difformis*, *C. haspans*, *C. odoratus*, *Sagittaria sagittifolia*, *Celosia argentea*, *Comonelina diffusa* and *Floscopa scandens*.
28.	Host Plant Resistance against *Rhizoctonia solani* Kuhn causing Foliar Blight in Soybean (*Glycine max* L. Merril) in Meghalaya.	Ms. Rimikini Laloo	-do-	2016	• The varieties/lines *viz*., Dsb 28-3, MAUS 706, KDS 869 and VLS were found resistant to *Rhizoctonia solani* causing foliar blight in Soybean.
29.	Identification and Characterization of Yellow Mosaic Virus (s) Associated with Yellow Mosaic Disease of Legumes in Mid-Hills of Meghalaya.	Ms. Yashi Umbrey	-do-	2016	• Yellow Mosaic Virus Disease of legumes under mid hills of Meghalaya was caused by a distinct strain of MYMIV with a recombinant DNA B derived from variant MYMIV.
30.	Evaluation of Biocontrol Potential of Bacterial Endophytes against Major Diseases of Rice.	Mr. Abdel Baset Hassan Mohhammed Mohmoud	-do-	2016	• Bacterial Endophyte 34 WE obtained from roots of wild rice showed better performance in several PGP attributes (Cellulase production, shoot elongation, root elongation and vigour index) and in terms of biocontrol potential against *Pyricularia grisea* and *Xanthomonas oryzae pv oryzae in vitro* conditions.
31.	Evaluation of Microbial Antagonists against Major Plant	Mr. Abhishek Gowda M.N.	-do-	2017	• Bacterial isolates GE 8 and FP 2 were the better performers against major stress (A1, Fe and acidity) *in vitro* conditions.

	Pathogens and Development of Microbial Consortium in Liquid Formulation.				
32.	Studies on *Pesalotiopsis versicolor* (Speg.) Steyaert Causing Yellow Leaf Spot of Guava in Meghalaya and its Management *in vitro*.	Mr. Emanuel M. Sangma	-do-	2017	• Plant extracts (garlic, winged prickly ash, aloe vera) and biocontrol agents (*Trichoderma harzianum, T. viridae and Pseudomonas putida*) were found effective in inhibiting the growth of the isolates of *Pesalotiopsis versicolor*.
33.	Studies on the Antagonistic Potential of *Metarhizium* spp. Against Major Soil Borne Pathogens.	Ms. Leeza Loya	-do-	2017	• The native Metarhizium isolates *viz*., ML 3 and ML 6 were found to be the most effective against major soil borne pathogens of vegetables *viz*., *Rhizoctonia solani* and *Pythium aphanadermatum*.
34.	Studies on Antagonistic Potential of *Beauveria* spp. Against Major Soil Borne Pathogens.	Ms. Lipa Deb	-do-	2017	• The native of *Beauveria bassiana* isolate BP 1.1 was found most effective with respect to major soil borne pathogens *viz*., *Pythium myriotylum* and *Phytopthora infestans in vitro* conditions.
35.	Pathogenecity of Major Soil borne Plant Pathogens on Common Weeds in Meghalaya.	Mr. Pamala Prince Jayasimha	-do-	2017	• Most of the common weeds of Meghalaya were found susceptible to soil borne pathogens *viz*., *Sclerotium rolfsii, S. delphinii* and *Rhizoctonia solani* AG 1-IB.
36.	Studies on Morphology, Cultural and Physiological Variability of *Colletotrichum capsici* (Sydow.) Butler and Bisby Isolates Causing	Ms. T. Lalnunsangi	-do-	2017	• *Colletotrichum capsici* isolates collected from chilli fruits showed high variability in morphology, cultural and physiological characters.

	Chilli Anthracnose.				
37.	Studies on *Ascochyta phaseolorum* Sacc. Causing Ascochyta Blight on Cowpea and its Management	Ms. B.K. Namriboi	-do-	2018	• Carbendazim, turkey berry plant extracts and *Trichoderma harzianum* were found effective in inhibiting the growth of *Ascochyta phaseolorum* causing Ascochyta blight on Cowpea *in vitro* conditions.
38.	Management of *Alternaria* spp. Causing Black Leaf Spot of Cauliflower in Meghalaya.	Mr. Heipormi Papang	-do-	2018	• Pitcher plant extract, *Trichoderma harzianum, Mancozeb, T. harzianum* combined with copper hydroxide and combination of *B. subtilis* strains (BS217+CoB5Y1) were found effective against black leaf spot of cauliflower caused by *Alternaria* spp.
39.	Variability Studies of *Phomopsis vexans* (Sacc. & Syd.) Harter and Eco-friendly Management of Fruit Rot of Brinjal.	Ms. Moakala Jamir	-do-	2018	• *Phomopsis vexans* isolates showed high variability in cultural, morphological and physiological characteristics. • Allamanda extract and *Trichoderma harzianum* gave promising results for managing brinjal fruit rot pathogen r *in vitro* conditions.
40.	Evaluation of Bacterial Endophytes Against Ginger Rhizome Rot.	Mr. Meshanki Bamon	-do-	2018	• Microbial consortium of bacterial endophytes *viz*., GE-1, GE-4 and GE-6 was found effective against rhizome rot complex of ginger *in vitro* conditions.
41.	Evaluation of Potential Bacterial Endophytes Against Major Vegetable Pathogens.	Mr. Pranab Malakar	-do-	2018	• Bacterial endophytes *viz*., NGB 21 and BE 1 by the application methods *i.e.*, STMC + SMCBS + SFS (seed treatment MC + soil application before sowing + standard fungicide spray) were found highly effective against major foliar pathogens of vegetables.
42.	Formulation of Bacterial Endophyte Consortium for the Management of Alternaria Blight of Mustard.	Ms. Sushanti Thokchom	-do-	2018	• Seed treatment + root dip treatment + foliar spray of the microbial consortium of *Bacillus* spp. and fluorescent Psedomonas were found highly effective against Alternaria blight of Mustard under pot culture conditions.

43.	Incidence of Bacterial Soft Rot of Carrot in Meghalaya and Ecofriendly Postharvest Management.	Ms. Ashwini E.	-do-	2019	• The treatments *viz.*, garlic extract, sodium hypo chloride and net bag in different combinations were found effective against bacterial soft rot of carrot caused by *Pectobacterium carotvora* sub sps. *carotvora*.
44.	Incidence of Postharvest Fruit Rot of Chilli (*Capsicum annum* L.) and its Management in Meghalaya.	Ms. Bhashwati Sharma	-do-	2019	• The treatments *viz.*, betel vine extract, *Bacillus subtilis* (CoBY1), sodium metabisulpite, perforated poly bag and combination of sodium metabisulpite with perforated poly bag were found effective against fruit rot of chilli caused by *Colletotrichum capsici* under laboratory conditions.
45.	Cultivation of Shiitake Mushroom (*Lentinula edodes* (Berk.) Pegler) in Wood Logs under Net House Conditions of Meghalaya.	Mr. Madhan N.	-do-	2019	• Strain DMR-388 of Shiitake mushroom was considered suitable for commercial cultivation and *Quercus griffithii* was considered as the best suitable tree species for its cultivation.
46.	Cultivation of *Ganodermalucidum* (W. Curt.: Fr.) P. Karst and its Antifungal Properties Against Phytopathogenic Fungi.	Mr. M. Roopesh	-do-	2019	• Among four substrates used for cultivation of antagonistic fungus *Ganoderma lucidum*, paddy straw with rice bran and wheat straw rice bran when supplemented at different concentration gave better yield.
47.	Standardization of Shiitake Mushroom (*Lentinula edodes* (Berk.) Pegler) Production Technology in Meghalaya.	Mr. Nandeesha S.V.	-do-	2019	• Sorghum grain was found as the ideal substrate for spawn production of Shiitake mushroom and wheat straw substrate used as the best substrate for indoor cultivation of Shiitake mushroom.
48.	Management of *Alternaria*	Ms. Anjana Rai	-do-	2020	• Seed treatment + foliar spray of microbial consortium of bacterium were

	brassicae (Berk.) Sacc. Causing Alternaria Blight of Mustard in Meghalaya.				found effective against *Alternaria brassicae* causing Alternaria blight of mustard under field conditions.
49.	Studies on Post-harvest Fruit Rot of Banana caused by *Colletotrichum musae Corda* in Meghalaya.	Ms. Liza Kalita	-do-	2020	• The highest incidence and severity of post harvest fruit rot of banana (*Colletrotrichum mesae*) was recorded in the warmer areas like Khanapara, Byrnihat and Nongpoh of Rhi-bhoi district whereas, the lowest incidence and severity of the disease was observed in Sohra of East Khasi Hills district.
50.	Incidence, Severity and Management of Turmeric Leaf Spot Disease (*Colletotrichum* spp.) in Meghalaya.	Ms. Madhusmita Mahanta	-do-	2020	• Two bacterial endophytic isolates viz., NGB 21 and BE 1 were found highly effective against turmeric leaf spot pathogen, *Colletrotrichum gloeosporioides* under in vitro conditions.
51.	Management of *Alternaria* leaf blotch of apple.	Mr. E. Pradeep Kumar	-do-	2021	• Garlic clove extract at 10%, *Trichoderma* sp. (MYE 9), *Bacillus amyloliquefaciens* (BE 43) and *B. niacin* (BG 34) were found highly effective against apple leaf blotch pathogen, *Alternaria mali* under in vitro condition. • In field experiment, garlic clove extract at 10% showed the lowest per cent disease index (PDI) of 25 per cent among all treatments.
52.	Characterization of Phyylloplane Microflora of Tomato (*Solanum lycopersicum* L.) and their Role against Major Foliar Fungal Diseases.	Ms. Monica Hajong	-do-	2021	• Two potential biocontrol agents isolated from tomato phylloplane *viz*., CPSH-2 and CPSH-11 showed the minimum incidence of late blight of tomato (*Phytophthora infestans*) with maximum yield under both pot culture and field conditions. • Among different treatments, it was found that the combination treatment (Seed + Soil + root dip + foliar) for both the potential biocontrol agents were found

					effective against late blight.
Ph.D. (PLANT PATHOLOGY)					
53.	Management of *Penicillium* Rot of Khasi Mandarin (*Citrus 167 eticulate* Blanco) by Using Native *Bacillus subtilis* Isolates.	Ms. Janshame Tariang	Plant Pathology	2019	• In Khasi Mandarin, post-harvest application of *Bacillus subtilis* as liquid formulation by immersing the fruit before storage and sending for sale to market was found the most effective one with minimum *Pennicillium* rot incidence even after 30 days of storage. • The two *Bacillus subtilis* strains *viz*., Bs 167 and COB5Y1 were identified as potential bio-agents, against post-harvest disease *Penicillium* rot of Khasi Mandarin.
54.	Bio-efficacy of *Trichoderma* Formulation Against Damping-off Caused by *Pythium* spp. and *Rhizoctonia solani* Kuhn. on Tomato (*Solanum lycopersicum*).	Ms. Markidahun Biam	-do-	2019	• *Trichoderma hamatum* and *T. harzianum* were identified as the dominant *Trichoderma* species associated with different habitats in Meghalaya. • The *Trichoderma* isolates v*iz*., TR55, TR66, TR122 and TR136 were found potential isolates against the damping-off caused by *Pythium* spp. and *Rhizoctonia solani* in Tomato.

SCHOOL OF SOCIAL SCIENCES (SSS)

Sl. No.	Thesis Tittles	Name of the students	Year of completion	Out comes (2-3 lines)
DISCIPLINE: AGRICULTURAL EXTENSION				
1.	Awareness and Utilization of agricultural Communication Sources among the farmers of Manipur	Ms. Amita H.	2012	• Significant association was found between awareness and utilization of communication sources and level of education, land holding, socio-economic status, cosmopoliteness, scientific orientation, information seeking behavior and market orientation.
2.	Analysis of public agriculture extension service in Tripura	Mr. Amit Debnath	2012	• The information output behaviour level of the clientele was medium (48.33 per cent). • Majority of the clientele had expressed medium relevancy (65 per cent), quality (51.67 per cent) but the

				overall clientele satisfaction was high (38.33 per cent) among more than one-third of clientele. • From the effectiveness indicators, the total expenditure intensity of the department was Rs. 3831.13/ha/year and extension expenditure intensity was Rs. 2260.46/ha/year. • The clientele contact intensity was 1.75 hr/clientele/year and the technical manpower: cultivator ratio was 1:1218. • The overall process level index was 68.88 and the overall outcome level index was 72.45 for the DoA
3.	A study of training needs of agricultural extension personnel in Meghalaya	Ms. Genialda Nongtdu	2012	• The important training need areas in order of importance are Soil Science, Entomology, Agronomy, Plant pathology, Nematology and Horticulture. Correlation analysis shown that age, service length, job performance and training exposure had negative and significant correlation with training needs.
4.	Adoption of resource conservation technologies inRice cultivation and its sustainability in Imphal West district of Manipur	Ms. K. Sony Devi	2012	• The finding also indicate that all the 5 psychological characteristics viz., economic motivation, risk orientation, innovation proneness, attitude towards RCTs and knowledge towards RCTs were found medium adoption by over 50% respondents with percentage distribution of 50%, 66.67%, 61.67%, 70% and 51.67% respectively.
5.	Agricultural innovation systems in System of Rice Intensification in Tripura.	Ms. Suchiradipta Bhattacharjee	2012	• The actors in the SRI innovation systems had fairly strong relationship among themselves and the interactive learning they developed through their association have assisted each other in increasing their knowledge base and efficiency in SRI. • While Department of Agriculture (DoA) has been a key player in the SRI innovation systems in the state, the unique role had been played by the local administrative units, the Panchayati Raj Institutions (PRIs) in creating mass awareness about SRI and providing assistance in development of the cultivators. • The AIS in SRI in Tripura had its own weaknesses like farmers were more the receiver of technology than being their generator; media being an isolate in Dhalai district and policies like MGNREGS having a negative impact on the income of SRI farmers through high labour cost or unavailability of labour.
6.	Impact of Rubber plantation on	Mr. Debashis Datta	2012	• It is found that majority of rubber growers' used to send their children to school and private tuitions also while,

	livelihood security of farmers of west Tripura district of Tripura.			only 30 % of non-rubber growers' send their children to school. Almost all the rubber growers' got economic support from government, where only 18.33% of non growers' got support from government for their respective cultivation.
7.	Profile and impact of women Self-help groups (SHGs) in Imphal west district of Manipur	Mr. Rajkumar Sandeep Singh	2012	• The study shows that 90.9% of the SHG members participated group meeting regularly and 95.5% of them were found contribute in common fund for the group regularly i.e. every week. 92.8% of the SHG members were returned loan in time regularly every week. Most of the SHG members (86.4%) and (59%) participated regularly in group activities and income generating activities respectively.
8.	An evaluative study on Home science training programmes in Ri-Bhoi district of Meghalaya	Ms. Liza BaiakmenlangNongdhar	2012	• The study revealed that majority of the trainees were in between 36-50 years of age and have studied up to middle school level. They had medium exposure to training and majority of the respondents were reported to have frequent follow-up of training programmes in their individual units or self-help groups. Majority of the respondents had medium achievement motivation and medium market orientation.
9.	Information need for pineapple growers in Meghalaya	Mr. Nathanial	2012	• The respondents feel that personal localite sources (50.36%) were more credible than personal cosmopolite sources (49.64%) but only just by a small margin. And among the personal localite sources family (32.37%) were perceived to be most credible.
10.	Impact of ICTs in Agriculture and Rural Development in Meghalaya	Ms. Rebekka Syiem	2013	• Mobile phones were widely used by the farmers for the purpose of communication with family and friends, contacting experts on real time basis for getting agricultural advisories and contacting middle-men for marketing of produce. The presence of CSCs at the village level has been a boon to the few young educated farmers for educational purpose. • The impact of ICTs on the awareness of the farmers reported to be high for disease and preventive measures under rural health. Impact was also recognized in knowledge enhancement particularly for pest and disease management of potato. • Farmers reaped manifold benefits in terms of its time saved by 15.9 fold for agriculture, 8.6 fold for rural health and 1.1 fold for rural education while cost reduced through using ICTs to avail services for agriculture is 14.84 fold, 13.4 fold for rural health and 0.71 fold for rural education respectively. • Around 39 per cent of the farmers reported to have better price realization through market price

				information and better marketing of produce through the ability to communicate efficiently to sell their products to identify market location, information on prices of commodities by contacting fellow farmer producers and market middlemen.
11.	Adoption of Improved Mentha Cultivation practices by farmers in Central Uttar Pradesh	Mr. Ajeet Kumar Pal	2013	• 65 percent of the respondents belonged to medium level adoption category and the mean overall adoption score was 30.49 %. • Adoption was highest in the main areas transplanting and harvesting while pest management and nutrient management had lowest adoption. • The variables found to be significantly associated with extent of adoption of mentha cultivation practices were education, land holding, annual household income, experience in mentha farming, contact with extension agents, mass media exposure, trainings attended on mentha, irrigation source, labour availability, marketing channel and access to distillation unit. • Decrease in water table was the most important undesirable consequence reported while desirable consequences include high profit, increase in socio-economic status
12.	Contextual Vulnerability of Climate Change in Agriculture: An Agro-Climatic zones analysis in Meghalaya	Mr. M. Defenderson Shadap	2013	• The result for the test for independence showed that there was significant difference in the level of Contextual Vulnerability among the three ACZs and the strength of independence was ascertained to be medium. The correlation analysis found out that Level of Educational Scientific Orientation, Innovativeness, Risk Orientation and Level of Awareness had significant positive correlation with contextual vulnerability.
13.	Legumes in Rural Meghalaya: A Socio-Economic Study	Mr. Sao Evalwell Dkhar	2013	• 11 different legume crops were found to be under cultivation by the respondents of selected areas. However, average areas put under cultivation of those crops were very low. • The per capita consumption of legumes by the respondents was found to be highest in case of West Garo Hills district (77.16 g/day), and lowest in East Khasi Hills (43.42 g/day). Low consumption was due to incompatibility with ethno-cultural food habits of the respondents, which prefers animal proteins as food item than pulse based ones. • Important problems as indicated by the respondents were poor yield, non-availability of inputs, utterly inadequate market information and almost inexistent irrigation system

14.	An Evaluative Study on the Impact of MGNREGA in Arunachal Pradesh	Mr.Bai Koyu	2015	• The study revealed that 10.26 lakh job cards were issued in the state during 2008-09 to 2013-14 with a total of 240 lakhs person-days jobs created. • Only 8.05 per cent of the works undertaken in the state could be completed till the end of 2013-14 and substantial proportion of the year wise allocated fund remained unspent in the state. • 61.25 per cent of the respondents were found to have medium level of awareness on various laid down provisions of the scheme.
15.	Gender Differences in Empowerment in Farm-Households of Tripura	Ms.Kankabati Kalai	2015	• Empowerment level for both genders can be increased by reducing workload and improving access to and decision about credit. For women attention is needed to be given in creating avenues and empowering them for public speaking. • Majority of women reported household drudgery, stringent traditional taboos & restriction, balancing farm & home and lack of gender friendly equipments as major problems. As for men, important problem was demanding family members.
16.	Assessment of Job Performance and Clientele Satisfaction of Selected KVKs in Mizoram	Mr. P. Lalhmachhuana	2015	• KVK staff perceive that they have low level of performance in getting samples tested (compost /fertilizers /plant protection chemical /seed / soil & water), ensuring that rural youths member within the KVK got a stable and reliable job. • The clienteles satisfaction was high towards the organisation of different communication methods and compatibility of the subject content with overall farming situation but found to be low in terms of developing vocational efficiency of rural youths • KVK staff requires capacity building in leadership & other soft skills, use of ICT tools.
17.	Entrepreneurial Behavior of Floriculturists in East Khasi Hills District of Meghalaya: A Critical Analysis	Mr.WanmidamehiPassah	2015	• Nearly two-third (62.50 %) of the floriculturists in East-Khasi Hills district of Meghalaya had medium level of Entrepreneurial Behaviour. • Personal characteristics of floriculturists viz., 'Education', 'Scientific orientation' and 'Mass media exposure' had significant association with 'Entrepreneurial Behaviour'. • About three-fourth of the respondents (70.00 %) had medium size of land holding.
18.	Farmers' Mitigation and Adaptation of Climate in Moderate and High Vulnerable Districts of Madhya Pradesh:	Mr.Pankaj Kumar Meghwal	2016	• State Department of Agriculture turned up to be the most active stakeholder. • The Likelihood Ratio of 'Level of Education of Farmers' and 'Awareness on Consequences of Climate Change in Agriculture' were significant with respect to 'Low' and 'Medium' categories of decision-making on adoption of mitigation and adaptation practices on climate change in agriculture.

	A Stakeholder Analysis			• Lack of information on appropriate adaptation option was the major problem being faced by the farmers in adoption of mitigation and adaptation of climate change practices in agriculture.
19.	Social Networks of Farmers on "Climate change Mitigation and Adaptation in Western Agro-climate Zone of Tamil Nadu"	Ms.Muthulakshmi B.	2016	• More than 70 % of the farmers had medium mass media access, had medium knowledge on climate change in agriculture and had high fatalism on climate change. • The average in-degree and out-degree, of four villages, in the study ranged from 1.571 to 3.619, which reflected poor interaction among villagers w.r.t climate change mitigation and adaptation in agriculture. • The average Geodesic distance of 3.119 revealed that at least three persons, on an average, are involved in fastest transmission of a new information on climate change mitigation and adaptation in agriculture.
20.	A study on information Management Behaviour (IMB) of Rice Farmers in Imphal West District of Manipur	Ms.Konjengbam Monika Devi	2016	• It was observed that almost half of the non-adopted farmers too had medium (4303%) level of IMB; but comparatively lower than the adopted farmers. The findings also indicate that the variables like social participation and mass media exposure contributed to the IMB of the non-adopted farmers. Among the adopted and non-adopted farmers there was significant difference in their IMB, annual income, occupation, social participation, mass media exposure, cosmopoliteness, extension orientation, innovation proneness and risk orientation.
21.	Training Needs Assessment of Agricultural Extension personnel in Arunachal Pradesh	Ms.Inne Lego	2016	• Majority of extension personnel had high level of training need • Training needs were high in micronutrient problem in acid soils and management and use of organic manures as fertilizers. • Training exposure of the extension personnel was low
22.	Usage of ICT in Agriculture by the Farmers and Extension Personnel in Dimapur District of Nagaland	Ms. DitolynSumi	2017	• Communication behaviour had significant association with ICTs. • The existence of significant difference in the both the 'Level of Awareness' and 'Usage of ICTs' between the Farmers and Extension Personnel were observed from the study area. Customized information in form of Voice Call/ SMS/ MMS in local dialect/ language in the area of interest and importance of farmers should be readily available. The organisations and departments concerned with agricultural development should be engrained with advances in ICTs for the speedy dissemination to farmers.
23.	Impact of use of ICT by rural youths of Manipur	Ms. Mayanglambam Victoria Devi	2017	• To study the access and utilization of ICTs by rural youth. • To analyze the impact of use of ICTs on rural youth.

				• To find out the constraints faced by rural youth in access and usage of ICTs.
24.	Gender Differences in the level of Economic Empowerment of farm- Households of Manipurs	Mr.Meghajit SharmaS.	2017	• To carry out gender analysis of economic activities within a farm-household • To assess the gender differences in the level of economic empowerment • To find out gender disaggregated constraints in economic empowerment
25.	A study on effectiveness of training programmes conducted by Krishi Vigyan Kendra (KVK) West Garo Hills of Meghalaya on Socio-Economic improvement of rice growers	Mr. Samir Medhi	2017	• It was found that trainings were effective in increasing the knowledge of trainees about improved rice farming practices hence more number of trainings should be organized by KVKs so that it can benefited to more number of rice growers. Different training programmes followed by field demonstration should be organised and imparted so that farmers develop confidence in them to take up improved methods to increase their productivity and improve their socio-economic condition. • 2. Allocation of budgets under contingency head should be increased for trainings leading to increase in dimensions and numbers of KVK trainings under different thematic areas of agriculture and allied sectors.
26.	Communication Behaviour of the farmers enrolled in M4agri NEI	Mr.Achin Kharmudai	2017	• To study the personal and socio-economic profile of the farmers • To study the communication behaviour of the farmers • To identify the constraints in usage of the services rendered by m4agriNEI
27.	A study on attitude of Agriculture collegian towards opting Farming as a Profession"	Mr.Deena Dayalan. S. K.	2017	• To study the personal, socio-economic and psychological characteristics of agriculture collegian. • To measure the attitude of the agriculture collegian towards opting farming as a profession and to find out its relationships with the personal, socio-economic, psychological characteristics • To know constraints of the agriculture collegian towards opting farming as a profession.
28.	A study on entrepreneurial behavior of the members of women self-help Groups in west Garo Hills District of Meghalaya	Ms. Chekame A. Sangma	2018	• More number of WSHG members (45.00%) were found to belong to age group of 35 – 50 years, most of the respondents (41.25%) were educated upto 10^{th} standard, majority of the respondents (75.00%) had family size ranging from 5 to 9, most of the respondents (58.75%) belonged to medium monthly income category, and 90.00 per cent of respondents had land holding of less than 1 ha. Majority (70.00%) of the respondents had medium level of social participation. More than two-third of the respondents (68.75%) had medium mass media exposure.

				More number of the respondents (56.25%) had medium level of aspiration.
29.	Adoption Behaviour of Rice Growers on improved Rice Technology through Krishi Vigyan Kendra (KVK) in Khowai District of Tripura.	Ms. Debjani Das	2018	• The study also reveals that majority of the respondents in KVK adopted villages had medium level of knowledge on improved rice farming practices (54.16%), level of adoption (55.00%), level of productivity (68.34%), annual net income (81.67%), self confidence (58.33%) and materials possession (60.00%). Among the independent variables under study age, education, farming experience, annual income, training received, land holding, were found to be significantly associated with the knowledge and adoption level of improved practices of rice technologies. • Inadequate availability of quality seed at proper time, lack of knowledge about scientific cropping pattern, cropping system, method of application, non-availability of improved implements and other critical inputs such as FYM/organic fertilizers, low price of product in local market, lack of storage and marketing facilities, lack of guidelines about seed treatment were the major problems faced by the respondents with respect to adoption of improved rice cultivation practices in the study area.
30.	Assessment of child poverty in rural farm-households of Garo Hills, Meghalaya"	Mr. Guruprasad Nagesh Hedge	2018	• To study the profile of children living in the poor rural farm households. • To find out the dimensions of poverty among those children
31.	Agro-Advisory Effectiveness of m4agriNEI on Climate sensitive sustainable agriculture: An Evaluative Study	Mr. IrshadHussain	2018	▪ More than half (55.20%) of the total respondents were found to be in the middle aged group followed by young aged group about (34.30%). ▪ Around (38.80%) of the respondents had an educational qualification of up to high school followed by one-third (35.10%) of the respondents had primary education qualification and (12.70%) were found to be illiterate. ▪ Majority of about (80.60%) of the respondents were found to be in marginal famers.
32.	Ascertaining m4agriNEI Farmers' innovations on climate-smart agriculture: A case study	Mr. Salam Prabin Singh	2018	• Apropos to the 'Age' of the respondents, that more than half of the total respondents (55.38 %) belonged to the middle age group (35 – 50 years). • With regard to 'Level of Education', highe percentage of the respondents (35.40%) have 'High School' level of education. • As far as 'Annual Income' was concerned, it was found out that majority of the respondent (69.23%) belonged to

				'Medium Annual Income' group.
33.	A Study on Entrepreneurship Behaviour of Tribal Farmers in adoption of Improved Piggery Farming Practices in Dhalai district of Tripura	Mr. Biswajit Debnath	2018	• Out of 120 respondents, majority of farmer belonged to middle age (35-50 years) category. • The findings also indicated that majority of the farmers had medium family size (47.50%), medium level of experience in pig farming (54.16%), medium level of annual income (46.67%), medium level of economic motivation (50.84%), medium level of mass media exposure (48.34%) and medium level of extension contact (43.34%). • The study has clearly shown that most of the farmers had medium level of entrepreneurial behaviour with EBI score ranging from 41.26 to 68.56.
34.	A Study on organizational climate as perceived by the employees of district agricultural offices in Meghalaya	Mr. Sachin V R	2018	• Majority of overall (51.52%), grade A (46.53%) and grade C (40.74%) employees perceived organizational climate at medium level. Whereas grade B employees perceived at very high, high and medium levels in equal percent (32.00%). • In age, majority in overall employees are old(40.00%), grade A(42.86 %) and grade C(48.15%) are young and grade B (44.00 %) are middle aged. • In education, majority in overall(28.75%) and grade B(76.00%) employees are 12^{th} passed, grade A(67.86%) and grade C(62.96%) employees are BSc.(Agri.) graduates and 10^{th} passed respectively.
35.	Impact of Horticulture-Hubs on the farmers of Meghalaya	Mr. Kungumaselvan T	2019	• It was observed the mean extent of adoption was found to be highest in the case of anthurium (68.17 %) followed by strawberry (64.85 %). However, in case of polyanthus and (47.58 %) and ranenculus (48.33 %), the extent of adoption was comparatively lower. • . Impact was assessed in seven selected impact indicators. In case of knowledge level on recommended practices, significant increase was observed the beneficiaries over time. • In Knowledge level of the beneficiaries was increased significantly compared to before due to training attended on improved package of practices, regular contact with the horticulture officers and progressive farmers.
36.	A Study on e-readiness of extension personnel in agricultural institutions in Ri-Bhoi district of Meghalaya	Nikhil J.	2019	• More than three fourth (81.67%) of the respondents belonged to the middle age (32-48 years) group and 65 per cent of them were male respondents. • Little above half (53.34%) of the respondents possessed doctorate degree followed by 28.33 per cent with post-graduation. • Majority (70.00%) of respondents had medium job experience with a range of 4-19 years while 41.67 per

				cent of the respondents' major job responsibility was teaching.
37.	Analysis of innovation system of horticulture in Meghalaya	Sengmitchi D. Sangma	2019	• Actor linkage matrix revealed that linkages between stakeholders with similar organizational levels were stronger than linkages between stakeholders working at different organizational levels. • The social network analysis of the stakeholders of the hubs revealed that overall the networks were very loosely connected to each other with many absent ties. • Among the policies and support structures existing in the state Mission for Integrated Development of Horticulture (MIDH) and Floriculture Development Scheme have been a major contributor to the success of horticulture development in the state.
38.	Dynamics of Design Thinking on Climate Smart Agriculture by Under-Graduate Students in Agriculture under Central Agricultural University Imphal	Mr. EllyKipkorirKirwa	2020	• The concept on Integrated Agriculture and Animal Husbandry Farming Systems based CSAPs should be subject to DT for students. • Theoretical based teaching and learnings systems should be oriented towards practical based which have a composite systems on enhancing Competency on ICT Application, Ability to Visualize Abstract Ideas, Memory Retention, Reading Behaviour and Aptitude of students.
39.	Nutrition Competencies of Agricultural Extension and Advisory Service (AEAS) providers in Meghalaya	Mr. NkululekoNyoni	2020	• Through an extensive review of available literature, a total of 37 nutrition competency items for AEAS providers' nutrition extension were identified across eight (8) broad dimensions viz; Farming systems that promote nutrition, Post-harvest handling & food safety, Managerial & planning skills, Household nutrition planning, Gender-related nutrition issues, Affective & soft skills, Extension education & communication and Knowledge on human nutrition & related programmes. • Overall, AEAS providers' nutrition extension competency ranged between high to very high (mean 3.56 to 4.50) with highest competency in affective and soft skills ($\bar{x}$=4.50, S.D 0.75), followed by knowledge on human nutrition and related programmes ($\bar{x}$=3.92, S.D 0.92) and extension education and communication ($\bar{x}$=3.83, S.D 1.05) dimensions.
40.	Community Participation and Perceptions in Rural Tourism: A study in Khasi Hills of Meghalaya	Ms. PagadalaSaiPriyanka	2020	• A total of 15 categories of community stakeholderswere identified.The*dorbar*was the only stakeholder category observed to perform multiple roles and reported to be involved in all activities at various levels of participation and forms the major decision-making body. Tourists had high importance and *dorbar* had high influence

				associated with rural tourism project in both the villages.Stakeholders of Mawlynnong village had more strong linkages among themselves than that of Sohliya village. • 80.00 percent of respondents from Mawlynnnong and 53.34 percent of respondents from Sohliya had favourable attitude towards rural tourism. Factor 4 'opinion about tourism development' was ranked first and factor 1 'community and personal benefits derived from tourism' was ranked second in both villages. • Sightseeing was the most practiced experience by tourists in Mawlynnong (70.00%) and in Sohliya (80.00%).Tourist of Mawlynnong were relatively more satisfied ($\bar{x}$= 3.87) than that of Sohliya ($\bar{x}$=3.56).
41.	Mapping Informal networks of Mera Gaon Mera Gaurav (MGMG) Beneficiary Farmers in Ri-Bhoi District on Adoption of Climate-smart Agricultural Practices	Ms. Polasa Bhuvanasri	2020	• Information seeking and sharing of CSAPs by farmers in domains of CI, AAS, NRM and PP within the six MGMG adopted villages of CPGS-AS, CAU, Imphal and ICAR RC for NEH Region were very similar. • Innovation on CSAPs did not disseminate nimbly in a homophilous ISN of farmers. • Different ordinals of eight predictor variables *viz.*, 'Age', 'Gender', 'Education', 'Operational Land Holding', 'Annual Income', 'Farming Experience', 'Mass Media Access' & 'Knowledge on CSA Practices' indeed influenced/enhanced in the outcome of being Low, Medium and High ABCSAP.
DISCIPLINE: AGRICULTURAL ECONOMICS				
42.	Economics of ginger in Ri-Bhoi district of Meghalaya	Mr. Gyati Riku	2010	• MVP of inputs at their geometric mean level showed that farmers still have scope for further utilization of area and seed to increase the returns. In Ri-Bhoi district four marketing channels were identified and found that channel I was the most effective channel in case of quantity transaction (48% of total marketed surplus) while channel III was most efficient with marketing efficiency of 8011%.
43.	Comparative economics of system of rice intensification (SRI)	Ms. Beauty Debbarma	2011	• B-C ratio of was found more on SRI farm • The benefits of SRI should be realized by farmers through extension services • More training and awareness programmes on SRI should be initiated by the Govt.
44.	Economics of chow-chow (*Sechium edule*) in Aizawl district of	Ms. Lalrinsangpuii	2011	• The Cobb-Douglas production function indicated that the variables land and human labour were significant while input manures and fertilizers showed negative significant. MVP of inputs at their

	Mizoram			geometric level showed that farmers still have scope for further utilization of land to increase the returns.
45.	Economics of turmeric (*Cucuma longa* Linn.) in Jaintia Hills district of Meghalaya	Ms. Janailin S. Papang	2011	• The results of Cobb-Douglas analysis revealed that the regression co-efficient of land and manures, fertilizers and plant protection chemicals were significant. Regression co-efficient for human labour was negative and non-significant. An increase in expenditure on manure, fertilizer and plant protection chemical would result in improving the production of turmeric. There is no scope of increasing production by adding more human labour. The marketable and marketed surplus was found to be 63.08% and 60.56% to the total production respectively.
46.	Economics of pineapple production in Ri-Bhoi district of Meghalaya	Ms. Dayohimi Rymbai	2012	• Labour intensive • Establishment cost: Large > Medium > Small • Total cost: Large > Medium > Small • Returns: Large > Medium > Large • Marketed surplus : Large > Medium > Small
47.	Socio-Economic study of Mahatma Ghandhi National Rural Employment Guarantee Act (MGNREGA) in East Khasi hill district of Meghalaya	Ms. Dahun Shisha Dkhar	2012	• The study found that there was 27.43 per cent increase in the income of beneficiaries after working in MGNREGA. The present income of the beneficiaries was higher by 19.66 percent as compared to the non beneficiaries. The average monthly expenditure on food and non-food items of beneficiaries (after MGNREGA) also increases and was also found to be higher than that of non-beneficiaries.
48.	Economic analysis of Umton Syiem watershed, Meghalaya	Ms. Wansaka D. Kynjing	2012	• The income distribution among the sample households is more uneven in the watershed area than in the non-watershed area. The per family employment level was also higher in the watershed area indicating more employment opportunities by the project.
49.	Analysis of agri-based self-help groups in Meghalaya	Ms. Mary Prathyusha Gondi	2012	• It was found that the SHGs saved 76 per cent of the total committed savings. The outreach of internal loan was cent per cent for the first loan and 74 per cent for the repeat loans. On an average the groups received an external loan savings. About 86.67 percent of the members reported that the loan amount was sufficient.
50.	Economics of Rapeseed and Mustard	Ms. Monika Aheibam	2012	• Production function analysis reveals that the regression co-efficient for human labor and chemical fertilizers were found to be positively

	cultivation under zero tillage in Thoubal District of Manipur			significant while the regression co-efficient for seed and plant protection chemicals were turned out to be negatively significant. As indicated by resource use efficiency measures (MVP: MFC), seeds and plant protection chemicals per hectare were over utilized by the farmers in the study area which brought unnecessary huge expenditure.
51.	Rice cultivation in Senapati district of Manipur: An economic analysis	Mr. Koijam Johny Singh	2012	• The total area, production and yield of rice in Manipur during 2000-01 to 2011-12 have increased by about 5.30 per cent, 23.84 per cent and 17.33 per cent, respectively. The growth rates in area, production and yield of rice in Manipur during 2000-01 to 2011-12 was -0.67 per cent 0.68 per cent and 1.36 per cent per annum, respectively.
52.	Rice cultivation in West Tripura district: An economic analysis	Ms. Dipika Jamatia	2012	• The total area under rice has declined by about 11.72 per cent, total production has increased by about 74.40 per cent and yield has increased by about 97.55 per cent during the period of 1985-86 to 2009-10. The growth rates in area, production and yield of rice in Tripura during 1985-86 to 2009-10 was -0.32 per cent, 2.08 per cent and 2.41 per cent per annum, respectively.
53.	Economics of production of cashew in West Garo Hills district of Meghalaya	Mr. Pradip Sangma	2012	• The overall total cost of establishing a cashew orchard was estimated to be Rs 28542.00 per hectare and the establishment cost was highest for a large category of orchard amounting to Rs 28728.00 in comparison to small (Rs 28016.00) and marginal(Rs 26686.00) category of cashew orchard. The gross return obtained from the harvest in the fourth year was estimated to be Rs 117600.00 for marginal category and for small and large growers, it was estimated to be Rs 107800.00 and Rs 110950.00, respectively.
54.	Economic analysis of production and marketing of Areca nut in East khasi hills of Meghalaya	Mr. Remdor Dkhar	2012	• Economic analysis of data reveals that areca nut cultivation is economically feasible and viable in the study area. Two major channels were identified efficient in three selected markets. Channel-I was found efficient in Sohra market and Channel-II in Pynursla market.
55.	Sustainability of wetland transplanted rice farming in Nagaland	Mr. Sajapong	2013	• Per hectare cost of rice cultivation was `49575.80/ha in Nagaland. • The net return was calculated to be `3583.39/ha. • About 86.05% of the farms in lowland were moderately sustainable and in upland 70.27% of the farms were sustainable.

56.	Performance Analysis of Co-operative Credit Institutions in Manipur	Ms. Janee Yumlambam	2013	• The overall recovery performance of MSCB was poor. The Heigrujam and kangmong PACS of valley region, found to be good in recovery position. Ratio analysis has revealed that the liquidity position of PACS was satisfactory. Long term solvency position of the PACS was poor.
57.	Economics of strawberry production and marketing in Ri-Bhoi district of Meghalaya	Mr. Damewan Muliar	2015	• The costs and returns both found to be increased with the increase in size of farm which implies 'economies of scale'. • The total cost was higher due to variable cost than that of fixed cost • The share of net price received by the producers in consumer's rupee found to be higher in Channel-III (Producer → Retailer → Consumer). Channel-III was found efficient than Channel-I and Channel-II.
58.	Economics of Production of Selected Cultured Fisheries in Gomati District of Tripura	Mr. Ruben Mog	2015	• The fish production was found to economically feasible and profitable in the study area across the category. • The price spread was found to be higher under channel-I (Producer → Wholesaler → Retailer → Consumer), due to more marketing costs incurred by agencies involved and more marketing margins earned by them. • Inadequate financial support from the government, transportation, non-availability of fish feed, storage and non-availability of fingerling in time were the major problems faced by the fish producer in the state.
59.	Drought and rice productivity in Manipur: A socio-economic analysis.	Ms. Nivetina Laitonjam	2015	• About 18 years (54.55%) registered mild drought whereas moderate drought occurred only once. No severe and extreme drought has occurred during the study period. • One per cent increase in June rainfall led to 0.33 per cent increase in yield of paddy. • The average productivity of rice reduced from 3490.47 kg/ha to 2137.10 kg/ha during low rainfall/drought, which is a loss of 35.09 per cent.
60.	Rainfall variability and rice productivity in Meghalaya: A socio-economic analysis.	Mr. Deotrephy K. Dkhar	2015	• All the monsoon weeks (22nd to 39th SMW) have high (88-100%) probability of being wet week. • One per cent increase in June rainfall led to 0.75 per cent increase in yield of *kharif* rice whereas with one per cent increase in the amount of rainfall in August led to the decline in rice yield by 0.46 per cent. • With one percent increase in average monsoon rainfall led to the reduction in variability in yield of *kharif* rice by 2.38 per cent.
61.	Risk to drought in Nagaland: An empirical study of farm households	Mr. Baiarbor Nongbri	2016	• It was observed that the normal annual minimum and maximum temperature has increased in the range of 0.01˚C and 0.03˚C in Phek and Dimapur district of Nagaland during 1975-2013. He reported

				that the annual rainfall has decreased by 2.76 mm/year and 2.99 mm/year at Phek and Dimapur districts, respectively and has shown insignificant and negative trend. Moderate drought years were higher at Dimapur (17.94%) than at Phek (12.82%). Extreme drought was experienced at Phek during 2006 and at Dimapur during 2006 and 2012. • Due to the high sensitivity and low adaptive capacity, farm households were more vulnerable to drought and therefore, under high risk of yield loss.
62.	Economics of Chow-chow (Sechium edule) Cultivation in West Khasi Hills District of Meghalaya	Ms. Astha Barman	2016	• The total cost of production was estimated to be Rs. 135.42/q. • It was found that the marketable surplus was equal to the marketed surplus (96.57% of the total produce). • Four marketing channels were identified of which channel I was the most used channel as 42.80 per cent of the marketed surplus was sold through this channel followed by channel II (26.23%), channel III (18.72%) and channel IV (12.25%). • Unavailability of labour ranked 1st among production problems. While the most serious problem for marketing of chow-chow was lack of proper market. In case of market intermediaries, gluts during peak period were the most serious problem faced by them in handling of chow-chow. • Extension services should also be provided to make the farmers aware of new technologies and farming practices in order to increase quality and quantity of output. • Proper storage facilities are to be developed in order to reduce post-harvest losses.
63.	Economic Assessment of Lemon Production in Ukhrul District of Manipur	Ms. Singyala Chiphang	2016	• The CAGR for production revealed that the growth rates for area, production and productivity were positive for all districts in Manipur. • Government may promote rainwater harvesting structure to irrigate the lemon orchard as 62.88 per cent have been reported of irrigation problem. • Government subsidy on planting materials and other agricultural inputs for farmers to encourage them to undertake cultivation of lemon in the region.
64.	Economics of Large Cardamom Production in Zunheboto District	Ms. Tovinoli Shohe	2016	• Compound Growth Rate computed for area, production and productivity of large cardamom in Nagaland showed positive growth rate only in

	of Nagaland			area, while growth rate of production and productivity was found to be negative in the state. • The net farm income was estimated to be Rs. 251559.65 per hectare. It was observes that the net farm incime increased with increase in age of the plants. • The study on economic viability measurers indicates the cultivation of large cardamom to be economically feasible and viable in the study area.
65.	Economic analysis of pineapple production in Tripura	Ms. Juicy Debbarma	2016	• The costs and returns both found to be increased with the increase in size of farm which implies 'economies of scale'. • The major problems expressed by both marginal and small category farmers were the cost of earthing up/ intercultural operation, marketing problem, storage problem, non-availability of quality planting materials, lack of credit facility and transportation problem
66.	"Rice cultivation under climate change in West Siang district of Arunachal Pradesh: An Economic study"	Ms. Mun Yomcha	2017	• The monsoon onset dates got delayed to 2nd week (30%) or 'after the 2nd week' (20%) during 1984-1993. • Majority of the farmers (60%) perceived the case of rainfall deficit at 6-10 per cent level while 58 per cent and 18 per cent farmers reported about the occurrence of sudden excess rainfall at 6-10 per cent and 11-20 per cent, respectively. • August rainfall is a risk increasing factor while, July rainfall is a risk decreasing factor.
67.	Economics of khasi mandarin in East Khasi Hills and West Khasi Hills districts of Meghalaya	Mr. Sukheimon Passah	2017	• The net cash flow (net return) was worked out to be more on group II orchards. It may be due to better management practices used by them. • The NPV (₹ 226289), B: C ratio (2.26), IRR (22) and PBP (0.67) was found to be economically feasible and profitable in the study area across all the groups of orchards. Even though the economic indicators show a positive results in term of investment opportunity but it was not able to generate surplus from it for reinvestment at the farm (mandarin orchards). • Channel III was found to be most efficient in both the market with market efficiency of efficiency of 17.20 in Sohra market and 12.05 in Mawkyrwat market. This was mainly due to the absence of intermediaries.

68.	Value chain analysis of fish in Loktak Lake of Manipur	Mr. N. Chinglen Meitei	2017	• It is observed that Manipur shows a positive growth rates in production (4.67%) and productivity (4.68%) during the observed years • Maximum of the captured fish (41.67%) is disposed off through Channel-I (Producer→ Local trader (uunja) cum Retailer→ Consumer) followed by Channel-II (Producer→ Consumer) and Channel-III (Producer→ Wholesaler→ Retailer→ Consumer) with 33.33 percent and 25 per cent and it was observed that Channel-I was found to be most popular as maximum of the captured fish were disposed off through this channel.
69.	Production and Marketing of Kiwi in West Kameng District of Arunachal Pradesh	Ms. Ainy Taloh,	2017	• The average yield and the average returns from kiwi obtained by the sample farmers in overall group of orchards was found to be 3.63 t/ha and ₹ 270066.45/ha. • The overall disposal of kiwi was found to be highest in Channel I with 49.63 per cent which was followed by channel ll (42.05%) and channel lll (8.30%) of the total volume of their production. • The common constraints faced by the farmers was lack of knowledge and technical know-how, maintaining male and female kiwi plant ratio, lack of recommended package of practices in the orchard, marketing problems etc.
70.	Consumer behaviour of tourists for agri-products in Meghalaya".	Mr. Kunchum Suresh Krishna	2018	• Among all the agricultural products available at the stalls or with the vendors pineapple was most preferred by the tourists and the translation of first preference to actual purchase was 94.49%. • About 51.36% felt taste was an 'extremely important' attribute while making purchase decision and they either agreed or strongly agreed that they buy a product for its nutritional value, followed by freshness and organically produced. • WTP was highest in case of pineapple (42.47% to 43.13%), followed by orange (28.36%), bamboo pickle (14.28%), banana (9.21%) and chilli pickle (9.09%).
71.	Valuation of alder based farming system in Nagaland	Mr. Limasunep Ozukum	2018	• The farmers at Khonoma practiced total 23 combinations of different crop mix but three crops mix were followed by majority of the farmers. Most of the respondents cultivated potato, *naga* garlic as sole crops or potato with maize as intercrop. • The estimated value of the goods (biomass) provided by the system was `3.86 lakh/ha. • The total value of the services provided by the

				alder trees at Khonoma ranged from `30521.59/ha to `35171.82/ha.
72.	Socio-economic study on Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA) in Ri-Bhoi district of Meghalaya	Mr. Shaikh tabrez	2018	• The income and expenditure on some food and non-food items of beneficiaries had increased significantly after working under MGNREGA. The difference in monthly income between beneficiaries and non-beneficiaries was statistically non-significant. But the differences in expenditure of some food and non-food items were significant. The assets of beneficiaries had increased after MGNREGA. • No records entered in job card, demanded 100 days of work is not provided under the scheme in a financial year, inappropriate work season, less work related to soil conservation and land development and less wage rate were the major problem faced by all the participants
73.	Value Chain Analysis of Dairy Industry in Nagaland	Ms. Sedeno Chale	2018	• Majority of the respondent dairy farmers were concentrated in the medium herd size category. • The milk productivity was lower for local cows than crossbred cows; therefore, the local cows were kept mainly for meat purpose. • The major value addition was done only in Channel-lll, at the processor cum dairy cooperative's level. The study also revealed that some margin or profit was gained by the stakeholders at every stage of each channel.
74.	Economics of Tea cultivation in Tirap district of Arunachal Pradesh	Mr. Nowang Wangnow	2019	• The compound annual growth rate for area, production and productivity of tea in Arunachal Pradesh showed a significantly positive trend with 9.61 per cent, 21.20 per cent, and 10.56 per cent annual growth respectively from 2000-2001 to 2014-2015. • The operational cost was increasing from the beginning year up to the peak harvesting year because as the plantation mature the operational activities also increase such as pruning and weeding.The total variable cost was found to be higher than the total fixed cost. The share of hired labour in total variable cost was the highest component. Likewise, family labour was the most important component contributing to the total fixed cost.
75.	Performance of Agriculture in Sikkim: Assessing the satisfaction of farmers.	Ms. Minam Gamoh	2019	• The Gross State Domestic Product (GSDP) of Sikkim at constant (2011-12) prices was ₹1509525 in 2016-17. • Agriculture sector contributed 7.10 per cent to the total State GSDP. The agriculture GSDP increased in between 2011-12 to 2016-17 at constant prices but the

				share of the agriculture sector to total GSDP decreased. • The net sown area decreased by 18.95 per cent but the gross sown area increased by 9.21 per cent in between TE 1994-95 and TE 2014-15 which was due to the increase (11.36%) in cropping intensity (176%) in 2014-15.
76.	Economic analysis of milk production in Ri-Bhoi district of Meghalaya	Mr. Evans Kiprono Kemboi	2020	• Milk production per household was 23.59L and about 83.35% quantum of milk was disposed of through the cooperative society. • The yield gap present in the study area was very high, estimated to be 6.20L (91.06%) per day out of which 11.76% was yield gap I and 79.30% was yield gap II. • The size of the animal shed, experience, price of concentrate and labour were the important factors influencing yield gap in milk
77.	Economic analysis of milk production in East Khasi Hills district of Meghalaya	Mr. Jabir Ahmed	2020	• The average milk production in the study area was 39.81 L/day/household, out of which 96.66 per cent was marketed by the cattle rearers. • Substantial difference in milk yield was noticed at experiment station and farmer's farm. Total yield gap was 49.62 per cent, where yield gap-I is 6.52% and yield gap-II is 43.10%. • The experience in dairy farming, distance from farmer's farm to research station, contact with extension personnel, price of concentrate and human days allocated for dairying were significant factors influencing yield gap.
78.	Economic analysis of Cabbage production in East Khasi Hills District of Meghalaya	Ms. Kota Karuna Sri	2020	• The compound annual growth rate was found positive for the all the districts in Meghalaya and the CAGR for area, production and productivity under Meghalaya was found to be (2.59%), (3.01%) and (0.4%). The CAGR for area, production and productivity in East Khasi hills was (0.83%), (1.6%) and (0.84%). The reasons for the low yield growth rate might be lack of latest agricultural technical know-how, pest infestation etc • The total costs (TFC+TVC) in Zaid season was found to be ₹52129 and the productivity was found to be 58 quintals and gross income was ₹84578.50 and net returns was ₹32449.50 with the B-C cost ratio 1.60 and operating ratio was 54% when compared to Zaid season, winter seasons cost of cultivation was found to be low viz., ₹47834.42 and productivity was found to be 68 quintals with the gross income ₹88400, net returns was ₹40565.58. B-C ratio was found to be 1.84 with the operating

				ratio 47%. It was found that cabbage was economically profitable and viable and study reveal that winter cabbage was more beneficial.
79.	An evaluation of the public distribution system in Kamrup (Rural) district of Assam	Mr. Rizwan Ahmed	2020	▪ To understand and assess the status of functioning of PDS in Kamrup (Rural) district of Assam ▪ To estimate the impact of PDS in calorie intake of BPL households ▪ To estimate the various parameters for effective participation in PDS and identify the problems faced by households due to PDS
80.	A study on marketing pattern of potato in Meghalaya: Special reference to East Khasi hills district	Mr. Mumadi Rajavardhan	2020	• In the period 2005-06 to 2012-13 area used to grow potato highest positive growth rate was seen in South Garo hills (4.60%) followed by West Garo hills district (3.28 %). Among all the districts highest production growth rate was observed in West Garo hills district which recorded as 3.76 per cent. From 2013-14 to 2017-18 East Jaintia hills district recorded highest area growth rate to be 10.61 per cent during study period. • Highest marketing cost for summer potato and winter potato observed in channel-I due to presence of more marketing actors present in these channel followed by channel-II. In channel-III the producer's share in consumer's rupee was higher than other channels due to absence of marketing middlemen. It was reported in both summer potato and winter potato.
81.	Economic analysis of milk production in West Khasi and South-West Khasi Hills district of Meghalaya	Mr. Mridupaban Das	2020	• Average milk production was 3.68 L/day/household and the decisive agency in disposing surplus milk was middlemen/vendors who dispose milk of about 76.71 per cent household. • The TYG was 2.13 L/day/cow (2.21 L/day/cow in WKH and 2.01 L/day/cow in SWKH, respectively) and the TYG percentage was 244.83 per cent which comprises of yield gap-I (196.55%) and yield gap-II (48.28%) in the study area. • Experience in dairy farming (years) ($p<0.01$), scientific cattle shed ($p<0.01$), vaccination ($p<0.01$), education of the family head ($p<0.05$) and human days allocated for dairy (hours) ($p<0.10$) were the factors that significantly impacts the yield gap.
DISCIPLINE: ABM				

82.	Value chain of Agro Products in Manipur- A Case study	Ms. Amenri Thongam	2019	• The raw materials used by the industry were especially available within the state. The industry needs 1 metric ton of raw materials per day • But sometimes *King Chilli* were imported from outside the state like Nagaland and Assam • Other materials like packaging materials, spices, oil, and sugar are also imported from outside the state.
83.	Value chain analysis of honey in Meghalaya-A case Study	Ms. Missal Elbe Ch Momin	2019	• The forward linkage of the study comprised of the market distribution and the consumers. The processed honey was reassigned to the warehouse where the distributor makes an attempt and delivers their product to the super premium retail stores on order basis and the consumers are those with high purchasing power, hotels and restaurants and wellness retail outlets. • BEE Natural over the years has changed the lives of the people associated with it through social responsibility, economic equity and environmental sustainability
84.	A study on value chain of tea in Manipur	Mr. Hijam Thoiba Meitei	2019	• About (60%) of the total area under lemongrass cultivation is in Chingnungkhok, Imphal East. • The maximum percent of the establishment cost of lemongrass production is spent on buying planting material (28.04%). • The maximum percent of operational cost for lemongrass production is spent on harvesting (59.41%).
85.	Tripura Forest Development & Plantation Corporation & Rural livelihood Security of Tribals: A study of Corporate Social Responsibility	Mr. Oliver Uchoi	2019	• The maximum (65.83%) of the respondents were earning 1,00,000 and above per annum in the study area because It has been observed that the higher income in rubber was due to the large and medium land holdings among the respondents. • The other sources of income were from MGNREGA (100%), Construction works (58.33%), rubber fire woods (10%), rice (8.33%) and livestock (20.83%). • The success stories of Bonita tripura and Sundar mohan tripura shows that after getting scheme from TFDPC their life were well improved and had made a strong livelihood income compared to early days as there were no sources of income.
86.	Scope of value chain Management of Agri-products in Meghalaya	Ms. Iarasa Lakiang,	2019	• Urlong Tea Integrated Village Cooperative Society needs a decent network based supply chain to run them year long so that it may be set as an example of Buyer driven model through assuring quality product and to be converted into a business model.

				• Mutual trust is the key factor for developing a strong social capital within the tribal community through self help group was an exemplary of success case study in value chain analysis. • Overall proposal is to develop social capital via social networks for the success of any kind of business
87.	Study of Machal Spices Industry in Manipur	Mr. Thoudam Umashankar Singh	2020	• The average production of the company was approximately 6,100 kg per month and average cost of processing was approximately ₹3,68,500 per month, with an approximate average gross return of ₹13,13,400 per month and the Benefit Cost Ratio of the company from selling of processed spices was 1.36. • The values added per kg of Machal powder was ₹60.17 giving the net return of ₹81.83 for this particular product, values added per kg of Machal chilli powder was ₹60.67 and the net return is ₹89.33, values added per kg of Machal besan powder was ₹28.25 with a net return of ₹3.15, values added per kg of zeera powder was ₹59.73 giving ₹15.27 as net return of this product. The company do not have much challenges, they can adjust it from time to time but they have some major challenges like the brand imitation, market competition, shortages of electricity, transportation and road problems, etc.
88.	Value Addition in Cashew Nut – A case study of B.R. Industries in Meghalaya	Mr. Albert S. R. Sangma	2020	• The average production of the industry was 1200 kg of finished product per month and the industry consumes around 4800 kg of raw cashew in order to produce 1200 kilogram of processed nuts. The average cost of processing of cashew was approximately ₹1,61,232 per month and the average gross return is ₹7,19,400 per month and the net return per month is ₹1,26,168. Therefore, annual net return of the industry is approximately ₹15,14,016. • The industry supply 60 percent of processed nuts to Assam and 40 percent was consumed in Meghalaya itself. In Assam it is supplied to Guwahati city and Dhubri while in Meghalaya it is distributed to the local retailer and whole seller of Phulbari, Tura, Shillong, Baghmara and Williamnagar.
89.	A study of Lambu Subu Food and Beverages in	Ms. Dogin Mamung Anjalee	2020	• The kiwis were brought to the processing center after procuring it from the local farmers for ₹ 100

	Arunachal Pradesh			per kg and also from the owners' own orchard. After the fruit was brought to the processing unit, it was weighed and cleaned for removal of undesirable matters. Then, the processing starts, which involves fermentation, racking, fining, filtration, cold stabilization, bottling, capping, labelling so as to obtain the final product, kiwi wine. • The firm has a gross return of ₹ 37,49,500 per month of kiwi wine with total processing cost of ₹ 12,03,950 per month and Net return was ₹ 13,16,550 .The processing cost of 1 quintal of kiwi wine was ₹ 8889 having returns per quintal of ₹ 74,089 so, the value addition of 1 quintal of kiwi was ₹ 8889. Therefore, in a month 135.4 quintals of kiwis were used for producing approximately 3333 bottles of kiwi wine. The constraints faced by the firm were market competition from the local kiwi wine seller, lack of awareness of the product among people, no variety specific orchard etc.

2. Ph. D

Sl. No.	Thesis Tittles	Name of the students	Year of completion	Out comes (2-3 lines)
DISCIPLINE: AGRICULTURAL EXTENSION				
1.	A micro-level study on dimensions of emerging livelihood pattern of rural tribal youth in Tripura	Ms.Suchiradipta Bhattacharjee	2016	• Majority of resource poor youths are engaged in low0return remunerative sectors of occupation. • Size of land holding and asset endowment are important factors influencing occupational diversity • No significant gender differences in socio-economic and socio-personal characteristics of youth • Major constraints identified were low risk bearing ability, absence of veterinary facilities, turn-off of agricultural sector to be non-remunerative one, inadequate vocational training, reduced mobility and migration to cities.
2.	A study on impact assessment of the employment and livelihood linked programmes in Manipur	Ms. Khumukchan Stina	2016	• For MGNREGA, though the demand for work was found increasing and the fund utilisation high, the percentage of work completed was low. The number of person days generated was also low • No significant change was observed in income level of the beneficiaries after MGNREGA, however, SGSY have contributed a significant increase in income of the respondents by 39.64%. • Non availability of 100 days of work, late payment of wages, under payment of wages, non availability of tools and worksite facilities etc were the constraints perceived by the beneficiaries under MGNREGA. Constraints as per the

				beneficiaries under SGSY were complicated process in getting credit, long time period in getting credit, benefits of the program not read to the needed people etc.
3.	Jhumias of Manipur in North-Eastern India: A Livelihood Analysis	Ms. Punitha P	2017	• Analysis of livelihood diversification revealed that majority (60%) of respondents in Watershed Development Project in Shifting Cultivation Area (WDPSCA) found to exhibit low level of livelihood diversification, where as in Non-WDPSCA majority (49.37%) of respondents found to exhibit medium level of livelihood diversification. • ***Jhum*** income contributes the highest to the total farm income both in watershed Development project in shifting cultivation (WDPSCA) and Non-WDPSCA**.** The banana crop contributes the highest source of fruits income with an average income of Rs.37227 in Tamenglong district. • Lack of market access was the foremost infrastructural constraint expressed by the respondents of WDPSCA and Non-WDPSCA. Primary livelihood activities not leaving enough time to pursue diversification strategies followed by inadequate experience in expected livelihood activity and lack of role model entrepreneur in my village were the social constraints expressed in Non-WDPSCA. • The promotion of location specific livestock activities combined with common market place for cluster of villages and agri-business activities Banana fibre extraction in Tamenglong district for Jhumias need to be promoted by state government.
4.	Social Networks of Agricultural Stakeholders on Climate- Smart Agriculture in Meghalaya: A structural equation Modelling	Alethea Dympep	2018	• On estimating a structural equation model of the standardized parameters *viz.,* 'CSA Performance', 'Maladaptation, Risk perception of Climate Change', 'Perceived Adaptive Capacity' and 'Subjective Norms' through Confirmatory Factor Analysis, the study revealed that the exogenous variable 'Risk perception of Climate Change' was positively influencing the endogenous variable 'Maladaptation' at 5% level of significance. While the exogenous variables *viz.,* 'Perceived Adaptive Capacity' and 'Subjective norms' were positively influencing endogenous variable 'CSA Performance' at 1% and 5% level of significance, respectively. • The most prioritized constraints expressed by the farmers was the lack of support from government on adapting the CSA practices.
5.	Livelihood Security of	Ms. DeepaThangjam	2019	• From the result of the present study, it could be concluded

	Farmers in Meghalaya under Tribal Sub-Plan: A Result-Based Evaluation			that the performance of TSP has some impact on securing the livelihood and in empowering the respondents. • The findings showed that overall crop diseases and pest infestation ranked the most serious problems followed by cost and timely availability of inputs, marketing problems, climate risk and uncertainty, limited availability of skill training, livestock management, and post-harvest management. The result provides an opportunity for the existing program to consider and intervene towards the most important issue faced by the farmers in the region. This not only serves importance to existing program but also provides a background for policymakers for future interventions. The prime focus on the most need-based issue will help policymakers while introducing any kind of agriculture and rural development program/project.
6.	Implication of mobile phone Applications in Farming by Tribal Rural Youth of Meghalaya	Mr. TermaricOinam	2019	• For 'Mobile Phone Service Reliability' it could be reported that more than half of the respondents (67.08 per cent) had expressed medium level of mobile phone service reliability, followed by 18.75 per cent who opined that mobile phone services are highly reliable and only 14.17 per cent of the respondents expressed there is low mobile phone service reliability. 12. As far as 'Money Spent on Mobile Phone Monthly' is concerned it was known that more than half of the respondents (55.42 per cent) had medium level of money spent monthly (Rs. 101 - 200) on mobile phone applications and a quarter of the respondents (25.00 per cent) had high (Rs. 200 and above) money spent on mobile phone applications and only 19.58 per cent of the respondents had low level (less than Rs. 100) of money spent on mobile phone applications.
7.	Organisational Climate and performance of Krishi Vigyan Kendras in Meghalaya	Mr. Sao EvalwellDkhar	2019	• To study the aspects of organisational climate as perceived by employees of the KVKs. • To measure the organisational performance of different KVKs over the years. • To study the clienteles' satisfaction regarding services of the KVKs. • To gather suggestions for improving the services and outputs of the KVKs.
8.	Understanding the technological information Network in diffusion of	Ms. Jyothi SSP.	2019	• To identify the key stakeholders in the diffusion of CAU Rice varieties and understand their role and interrelationships • To map the social networks of rice farmers and determine

	Improved Rice varieties in Manipur			their degree of participation in disseminating CAU Rice varieties among the peer groups • To study the effect of network variables on the innovation adoption-diffusion process of the farmers • To identify the constraints faced by the stakeholders for effective linkages and farmers in accessing technology through their social networks and suggest suitable policy measures
9.	Social Simulation on Assimilation of Climate Smart Agricultural Practices in North Eastern Hill Region of India	Ms. M. Victoria Devi	2020	• In the study a total of thirty eight (38) CSA Practices which was suitable for the farmers of the selected Climate Change vulnerable districts in the three states had been identified. The identified CSA Practices were further categorized into six domains as: (1) Nutrient Smart CSA Practices, (2) Water Smart CSA Practices, (3) Soil Smart CSA Practices, (4) Carbon Smart CSA Practices, (5) Energy Smart CSA Practices, and (6) Knowledge Smart CSA Practices were established. The study could endeavour to identify the CSA Practices by interpolating the scores with respect to three pillars of CSA *viz.*, Adaptation, Mitigation and Food Security as identified by FAO, 2010. • As the Assimilation Gap of CSA Practices by farmers at present is alarmingly very high regardless of the availability on basket of potential CSA Practices. The barriers faced by extension specialists and farmers need to be examined and dealt seriously at ground level so that the hurdles are overcome by way of tripartite participation of (1) Scientific personnel of agriculture and allied disciplines, (2) Farming community, and (3) Decision makers who are in politics and executive bureaucrats of the respective state in particular and NEH region in general.
10.	Modeling e-learning for Climate-Smart Horticulture on High Value Horticultural Crops of Arunachal Pradesh: A Quasi-Experimental Approach.	Bai Koyu	2020	• In the study, there was a high extent of application of e-learning. • Asynchronous e-learning module on climate smart horticulture imparts significant increase in knowledge level of farmers. • E-learning Self-Efficacy, Perceived Ease of Use and Facilitating Condition are themost important attributes for the e-learning module to have significant influence onBehavioural Intention to Use.
DISCIPLINE: AGRICULTURAL ECONOMICS				
11.	Economic analysis of pineapple in Manipur	Mr. Ningombam Anandkumar	2016	• The growth of area, production and productivity for pineapple crops in the two regions *i.e.*, valley and hill

		Singh		region and as well as Manipur state as a whole were increased over the year and significantly positive. • The value of instability index was found to be positive of area, production and productivity for pineapple crop in both the regions and as well as Manipur state as a whole which means that there was no stable growth but less riskiness for growing pineapple. • The cultivation of pineapple was found to be profitable both the season, but it was more profitable in summer compared to the winter season
12.	An Empirical Study on Economics of Rice Production in Tripura	Mr. Pallab Debnath	2016	• The cultivation of rice in Tripura was observed to be quite profitable. • The net returns were comparatively higher in small category than the marginal category. • Among the factors of rice production, human labour, fertilizer and agrochemical had significantly positive effect on rice production in the state. Some of the production inputs, *viz.*, human labour and fertilizer should be increased while machine labour, seed, irrigation, manure and agrochemical should be decreased in Tripura in-order to make the resources allocatively efficient.
13.	Sustainable of rice farming in Manipur : An Economic analysis	Ms. L. Geetarani Devi	2016	• the sustainability of agriculture in Manipur. She reported that Imphal West is the most sustainable district in the state. The hill districts were ecologically more sustainable whereas economically the valley districts were better. She concluded there is a trade-off between ecological and economical sustainability. Farm level sustainability revealed that the majority of the farms in the study area were moderately sustainable. She recommended afforestation, organic farming as measure to improve sustainability of the farms.
14.	Adaptation to climate Change: An economic study of cereal crops in Eastern Himalaya	Ms. Dayohimi Rymbai	2016	• The magnitude of annual rainfall is declining in Manipur and Sikkim and has been erratic in nature. Maximum temperature has increased significantly in case of Manipur and minimum temperature has increased significantly in Sikkim. • The strategies adopted were limited, traditional and location specific which were adopted to specifically tackle the change in time of arrival in rainfall, whereas, no strategy was related with the change in temperature. The main adaptation strategies taken by the farmers are the change in transplanting time (Strategy 1) and the change in transplanting and harvesting time (Strategy 2). • The cost of rice cultivation has increased by `8505.63/ha and `6374.29/ha for Strategy 1 and Strategy 2, respectively during drought period. The net benefits realized was `1329.30/ha and `1568.67/ha in case of Strategy 1 and

				Strategy 2, respectively.
15.	Crop diversification and its impact on farming households of Manipur: A micro level study	Ms. Monika Aheibam,	2017	• The category-wise analysis of crop diversification at household level shows that 65 per cent of the marginal farms had high level of crop diversification followed by medium (19.61%); low (13.73%) and only about 2 per cent of very high level of crop diversification. • Overall, the category-wise analysis of level of crop diversification shows that in case of marginal farmers; about 54 per cent of the households had high level followed by low level (26.92%); medium level (17.95%) and very high level (1.28%). • The study found that the socio-economic factors which influence households' decision to diversify crop was farm size whereas, tools and machineries, fertilizer, availability of HYV or improved seeds, irrigation facility, exposure to farming information, training and market distance from homestead area were the technological and institutional factors which influence households' decision to diversify crop by the households in Thoubal district.
16.	Economics of solar powered pumping system in major crops of Rajasthan: a comparative study"	Mr. Narendr Kumar Meena	2019	• The establishment cost was estimated to be highest on solar irrigation system (without subsidy) followed by electric, solar (with subsidy) and diesel system of irrigation due to high initial investment on installation of solar system without subsidy compare to other irrigation systems. • Per hectare operational cost and cost of cultivation of kinnow farm with solar irrigation (with subsidy) was calculated to be least comparative to other irrigation systems. • The kinnow cultivation under all the irrigation systems was proved to be cost-effective and feasible and viable economically in the study area.
17.	Vulnerability and Adaptation to Climate Change: A Study of Rice Farms in Manipur	Ms. Nivetina laitonjam	2019	• There was significant increasing trend in maximum and minimum temperature in the study area during 1975-2013. • The 3-months, 6-months and 12-months SPI showed that there were occurrences of extreme climatic variability like extreme wet, very wet, moderate wet and extreme dry, very dry and moderate dry condition in the study area. • Although a hill district, Churachandpur district was categorized under low vulnerability due to low exposure and sensitivity while, Imphal East district was categorized high vulnerability due to high exposure and sensitivity to climatic variability.
18.	Livelihood	Ms. Singyala	2020	• Organic farming is economically more profitable as it has

	Security through Organic Farming in North East Hill Region of India: An Economic Analysis	chiphang		cost saving benefits in several aspects and also increases the gross income of the farmers as organic produce fetches more prices in the markets. • Majority of the respondents irrespective of the organic adopters (40.67%) and non-adopters (40%) were having moderate level of livelihood security. Organic adopters were found to be higher reflecting the direct impact of adoption of organic method for cultivation of different crops. • For the non-adopters, household size, total farm income, land holding and access to market were the significant factors influencing their livelihood security.
19.	Food and Nutritional Security at Farm Household Level in Meghalaya: Impact of Government Schemes	Mr. Baiarbor Nongbri	2020	• There were mainly two main sources for food availability across households in the state of Meghalaya *viz*., own farm production and market sources. PDS system was the other main sources for rice availability. • It was estimated that there was a gap or deficit in terms of food supply in the state. Thus, self sufficiency of food across the state was still a challenged whereby, epitomised that the state still depends on other states for food imports. Considering the food basket, there was a huge gap in the calorie intake across various food items and rice was still the main staple food contributing the maximum calorie intake.