

Personal Details



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Research Interest

Genetic resource management of fruit crops, fruit based production systems under rainfed conditions, High density orcharding in fruit crops, Canopy management in horticultural crops

Research Highlights

- A. Novel concepts developed
 - a. Different shoot growth parameters, plant phenological characters, shoot biochemical composition have been identified for successful prediction of panicle emergence in litchi cv Shahi.
 - b. Role of wax bound and wall bound phenols on host resistance mechanism in different powdery mildew resistant varieties of peas have been understood
 - c. Biochemical changes associated with host-pathogen-antagonist interaction with respect to guava wilt have been characterized under field as well as in vitro conditions
 - d. Biochemical basis of plant defense responses against infection of *Ralstonia solanaceum* in tomato was studied. The study clearly brought about evidences of higher content of total phenol, total soluble protein and total free amino acids in the bacterial wilt resistant plants indicating their efficacy to be used as marker for resistance against bacterial wilt
 - e. The pattern of utilization of cellulose by oyster mushroom on paddy straw media has been characterized
 - f. Characters like young leaf colour, leaflet blade shape, leaf margin curvature, leaflet apex shape, leaf shape index, fruit shape have been identified as suitable characters for distinguishing litchi genotypes
 - g. Identified different phenological parameters in mango plants associated with plant's response to incidence of disease and insect pests
- B. Varieties released and adopted in the field
 - a. Jackfruit variety Swarna Manohar
 - b. Jackfruit variety Swarna Poorti
 - c. Garden pea variety Swarna Amar
 - d. Garden pea variety Swarna Mukti
 - e. Snow pea variety Swarna Tripti
- C. Production technologies developed and adopted in the field
 - a. Identification of suitable varieties of different fruit crops for cultivation in the region viz Litchi variety Shahi and China, mango varieties Mallika, Himsagar and Amrapali, guava varieties Allahabad Safeda and Sardar, Aonla varieties NA-7 and Kanchan, sapota variety Murabba, strawberry variety Douglas
 - b. Ultra high density orcharding in guava planted at a spacing of 2 m x 1 m accommodating 5000 plants per ha have been found to be most effective for increasing profitability by adoption of effective canopy management strategies
 - c. Mango based-, litchi based- and aonla based multitier cropping systems having mango, litchi and aonla, respectively as main crops, early bearing short statured trees like guava planted within and between the rows as filler crops and annual crops, grown in the interspaces as intercrops recommended for optimizing land, space, nutrient and water use efficiency of the production system under upland conditions
 - d. High density planting of mango cv. Amrapali at 2.5 x 2.5 m spacing was found to be more profitable during the initial years (upto 11 years) and subsequent removal of alternate plants (final spacing 5.0 x 5.0 m) after 12 year of planting can be a suitable strategy for obtaining maximum yield under sub-humid plateau region of Eastern India.
 - e. Rejuvenation pruning followed by management of shoots, nutrient, water and application of paclobutrazole resulted in improving the productivity of unproductive, old and senile mango orchards.

- f. 50% removal of rainy season crop have been recommended for maximization of profitability of guava cultivation under rainfed conditions of eastern plateau region.
- g. In litchi cv. China growing under Ranchi conditions, a fertilizer dose of 500g nitrogen, 500 g phosphorous and 300 g K₂O/plant/year was found to be optimum during the junior adult bearing stage of the plant
- h. Root exposure at a distance of 120 cm from trunk and up to a depth of 60 cm was found to be the best treatment for increasing productivity.

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Memberships / Fellowships

1. Life member of Horticultural Society of India
2. Life member of Hill Horticulture Society
3. Life member of Horticulture Society of Chotanagpur
4. Life member of Orissa Horticulture Society

Technology Developed

1. Jackfruit varieties Swarna Manohar and Swarna Poorti
2. Mango-, litchi- and anola-based multitier cropping systems for uplands
3. High density orcharding in guava and mango
4. Crop regulation in guava under eastern plateau and hill conditions
5. Rejuvenation of mango

Publication Details

A. Research papers

1. Bikash Das and B.R. Jana (2012) Effect of canopy management on growth and yield of mango cv Amrapali planted at close spacing. *Journal of Food, Agriculture and Environment*. 10 (3&4): 328-332
2. Bikash Das, B.R. Jana, P. Dey and Vishal Nath (2011) Assimilate partitioning behaviour in relation to fruit growth in Shahi litchi. *International Journal of Fruit Science*. 11(1): 88-98
3. Bikash Das, Vishal Nath, B.R. Jana, P. Dey, K.K. Pramanick and D.K. Kishore (2007) Performance of strawberry cultivars grown on different mulching material under sub-humid sub-tropical plateau conditions of Eastern India. *Indian Journal of Horticulture*. 64(2):136-143
4. Bikash Das, Vishal Nath, B.R. Jana, S. Kumar and P. Dey (2007) Evaluation of different methods of crop regulation in guava grown under rainfed plateau conditions of Eastern India. *Indian Journal of Horticulture*. 64 (3):294-299
5. Bikash Das, Vishal Nath and P. Dey (2004) Investigations on flushing and panicle emergence in litchi under sub-humid sub-tropical plateau region of eastern India. *Indian Journal of Horticulture*. 61(1):1-5
6. Bikash Das and P.C. Jindal (2002). Dynamics of anthocyanin and sugar accumulation in grape berry. *Indian Journal of Plant Physiology*. 7(1):86-87

7. Bikash Das, A.K. Sureja and P.C. Jindal (2002) Flowering and fruit set in litchi (*Litchi chinensis* Sonn.)– A review. *Agricultural Review*. 23 (1): 59 - 64
8. Bikash Das, S.N. Pandey, P.C. Jindal and A.K. Sureja (2001) Effect of dormex, CPPU and GA3 on berry growth and ripening of Pusa Seedless cultivar of grape. *Journal of Applied Horticulture*. 3(2):105-107
9. Bikash Das and Vishal Nath (2006) Pattern of intra-plant variation in fruit quality in litchi cv. Shahi with respect to size and type of fruit sample. *International Journal of Tropical Agriculture*. 24(3-4):366-371
10. Bikash Das, Vishal Nath, Mathura Rai and P. Dey (2007) A short note on pattern of growth and carbohydrate partitioning of current season flushes during fruit growth in litchi cv. Shahi. *The Orissa Journal of Horticulture*. 35(1):103-106
11. Bikash Das, Vishal Nath, B.R. Jana and Mathura Rai (2006 (Published in 2008)) Performance of sapota genotypes during initial bearing stage under sub-tropical plateau region of Eastern India. *Progressive Horticulture*. 38(2):184-187
12. Manoj Kumar, Bikash Das, K.K. Prasad and Prashant Kumar (2012) Effect of integrated nutrient management on quality of broccoli cv. Fiesta under Jharkhand conditions. *Asian Journal of Horticulture*. 6 (2):388-392
13. Asim Bandopadhyay and Bikash Das (2010) A survey study on fruit diversity in Chotanagpur plateau region. *Biospectra*. 5 (1): 97-104
14. Archana Prasad, Bikash Das and Manju Gerard (2010) Differentiation litchi genotypes based on leaf biochemical parameters: a feasibility study. *Biospectra*. 5 (1):105-110
15. Vishal Nath, Bikash Das and Mathura Rai (2007) Standardization of high-density planting in mango (*Mangifera indica*) under sub-humid alfisols of eastern India. *Indian Journal of Agricultural Sciences*. 77 (1): 3-7
16. B.R. Jana, Bikash Das, Vishal Nath, Mathura Rai and S. Kumar (2009) Evaluation of guava (*Psidium guajava* L) germplasm under eastern plateau and hill region. *International Journal of Tropical Agriculture*. 27 (3-4): 395-397
17. R.S. Pan, Bikash Das, S. Kumar, Mathura Rai and A.K. Singh (2007) Dynamics of leaf phenolic content and conidial germination in relation to powdery mildew resistance in garden pea genotypes. *Vegetable Science*. 34(2):127-130
18. Nath Vishal, Bikash Das, Mathura Rai and Rajesh Kumar Rai (2003), Centre opening induces stereo fruiting in litchi cv. Shahi. *Progressive Horticulture*. 35(2):219-220
19. Vishal Nath, Bikash Das, P. Dey, Mathura Rai, Manoj Kumar and Ashok Rai (2005) Orchard management practices for litchi in Eastern India- In situ water harvesting and moisture conservation for improving fruit yield and quality. *Prog. Horti.*, 37 (1):56-62
20. Nath Vishal, Bikash Das, Mathura Rai, P. Dey, S. Kumar and Manoj Kumar (2003) Mango based cropping system for uplands of sub-humid plateau region of eastern India. *Progressive Horticulture*. 35(2):142-145
21. Rai, Mathura, Bikash Das, Vishal Nath, Manoj Kumar and Rajesh Kumar Rai (2002) Fruit characteristics of litchi cultivars under Chotanagpur conditions. *Orissa J.Hort.* 30(2) 1-5
22. Vishal Nath, Bikash Das, M.S. Yadav, S. Kumar and A.K. Sikka (2005) Guava- A suitable crop for second floor in multistoried cropping system in upland plateau of eastern India. *Proceedings of the First International Guava Symposium. Acta Horticulturae*. 735:277-296
23. Sarita Mehta, Sanjay Kumar Singh, Bikash Das, B.R. Jana and Santosh Mali (2012) Effect of Pruning on Guava CV. Sardar Under Ultra High Density Orchard System. *Vegetos*. 25 (2) : 192-195
24. J P Sharma, S Kumar and Bikash Das (2012) Soil application of *Trichoderma harzianum* and *T. viride* on biochemical constituents in bacterial wilt resistant and susceptible cultivars of mango. *Indian Phytopathology*. 65 (3): 264-267
25. Vishwa Raj Lal, A.K. Singh and Bikash Das (2009) Studies on in vitro multiplication in pointed gourd (*Trichosanthes dioeca* Roxb.) through single node cuttings. *Biospectra*. 4(1): 163-166
26. Rai Mathura, Vishal Nath, Bikash Das and Ashok Rai (2003) Growing degree days requirement of mango cultivars under sub-humid plateau region of eastern India. *Orissa Journal of Horticulture*. 31(2):13-17
27. Rai Mathura, Vishal Nath, Bikash Das, Ashok Rai and Manoj Kumar (2003) Evaluation of jackfruit genotypes for yield and quality attributes under Eastern Indian conditions. *Orissa Journal of Horticulture*. 3(1):1-6
28. Nainwal N.C., Vishal Nath, Bikash Das and Nidhi Joshi (2003) Post Harvest handling of fresh litchi for export. *Progressive Horticulture*. 35(1): 1-10
29. Rai, Mathura, Vishal Nath and Bikash Das (2002). Heat unit summation – An index for predicting fruit maturity in litchi. *Ind. J. Hort.* .59 (1): 70 -74
30. Rai, Mathura, Vishal Nath, Bikash Das and H.P. Singh (2002). Changes in yield pattern during junior adult bearing stage of litchi cultivars in plateau region of eastern India. *Orissa J.Hort.* 30 (1): 8-12
31. Rai, Mathura, Vishal Nath, Bikash Das and B.R. Jana (2002). Genetic variability of fruit characters of litchi under Eastern Indian conditions. *Progressive Hort.* 34(1):39-43
32. Vishal Nath, Devendra Pandey, Bikash Das (2005) Diversity of bael (*Aegle marmelos* Corr.) in east central India.

- Indian Journal of Plant Genetic Resources. 16(3):222-225
- 33.Rai, Mathura, Vishal Nath, Bikash Das and Anil Kumar (2001). Cluster characteristics of litchi cultivars under eastern Indian conditions. *Progressive Hort.* 33(2):111-117
- 34.Muneswar Prasad, K.K. Prasad, Bikash Das and R.N. Ray (2010) Effect of inorganic and biofertilizers on yield, quality and post harvest performance of strawberry (*Fragaria ananassa* Duch) cv. Pajaro. *Journal of Research (BAU)*.22(1): 45-50
- 35.Muneswar Prasad, Manorama Minz, Rajesh Kumar and Bikash Das (2012) Effect of mulching and PGRs on growth, yield and economics of strawberry (*Fragaria ananassa* Dutch) cv. Douglas. *Journal of Interacademia*.16(1):44-45
- 36.Rai, Mathura, P. Dey, K.K. Gangopadhyaya, Bikash Das, Vishal Nath, N.N. Reddy and H.P. Singh (2002) Influence of nitrogen, phosphorus and potassium on growth parameters, leaf nutrient composition and yield of litchi (*Litchi chinensis* Sonn.). *Indian J. Agric. Sci.*72(5):132-136
- 37.P. Dey, Mathura Rai, K.K. Gangopadhyay, Bikash Das, Vishal Nath and N.N. Reddy (2010) Effect of phosphorus on growth, yield and nutrient use efficiency of litchi grown on Alfisol. *Indian Journal of Horticulture.* 67 (3): 394-395
- 38.Patel, V.B., S.N. Pandey, S.K. Singh and Bikash Das (2005) Variability in Jamun (*Syzygium cumini* Skeels) accessions from Uttar Pradesh and Jharkhand. *Indian Journal of Horticulture* 62(3)244-247
- 39.B.R. Jana, S. Kumar, Mathura Rai, Vishal Nath and Bikash Das (2009) Top-veneer grafting: A new approach to mango propagation. *International Journal of Tropical Agriculture.* 27 (3-4): 399-404
- 40.P. Dey, Mathura Rai, S. Kumar, Vishal Nath, Bikash Das and N.N.Reddy (2005) Effect of biofertilizers on physico-chemical characteristics of guava (*Psidium guajava*) Fruits. *Ind. J. Agric. Sci.*,75 (2):95-96
- 41.Sarita Mehta and Bikash Das (2012) Effect of pruning on root distribution in guava cv Allahabad Safeda under ultra-high density orcharding system. *Progressive Agriculture.* 12(2):303-309
- 42.Jaipal Singh Choudhary, Chandra Shekhar Prabhakar, Sudarshan Maurya, Ritesh Kumar, Bikash Das and Shivendra Kumar (2012) New report of *Hirsutella* sp. infecting mango hopper *Idioscopus clypealis* from Chotanagpur Plateau, India. *Phytoparasitica*. DOI 10.1007/s12600-012-0230-8
- 43.Ritesh Kumar, Sudarshan Maurya, Anjali Kumari, jaipal Choudhary, Bikash Das, S.K. Naik and S. Kumar (2012) Biocontrol potentials of *Trichoderma harzianum* against sclerotial fungi. *The Bioscan.* 7(3):521-525
- 44.Ritesh kumar, Sudarshan Maurya, Anjali Kumari, Jaipal Choudhary, Bikash Das, S.K. Naik, S. Kumar (2013) Biocontrol potentials of *Trichoderma harzianum* against sclerotial fungi. *The Bioscan.*7(3):521-525
- 45.S.K. Naik, S. maurya, Ritesh Kumar, J.S. Choudhary, Bikash Das, S. Kumar (2013) Evaluation of rhizospheric fungi from acid soils of Jharkhand on phosphate solubilisation. *The Bioscan.*8(3):875-880
- 46.S.K. Naik, S. maurya, Ritesh Kumar, K. Sadhna, S. Gagrai, Bikash Das, S. Kumar and B.P. Bhatt (2013) Inorganic phosphate solubilisation by phosphate solubilising fungi isolated from acidic soil. *African Journal of Microbiology Research.* 7 (34):4310-4316