

## **Theme I: Crop Improvement, Seed technology and Biotechnology**

1. Crop diversification in moth bean and rice bean
2. Crop diversification in safflower and mustard
3. Crop diversification in Brown top millet, Fonio, Teff, Amaranth and Quinoa
4. Identifying low GI food crops/varieties
5. Arresting pre harvest sprouting (PHS) in rice through small molecules
6. Arresting of pre harvest sprouting (PHS) in groundnut through small molecules
7. Reducing hard seed coat formation in pulses
8. Reducing shattering losses in green gram and black gram
9. Reducing shattering losses in sesame
10. Novel seed coating for faster germination, vigour, disease resistance and mitigating nutrient deficiency
11. New plant architecture for yield and mechanization in black gram and green gram
12. New plant architecture for yield and mechanization in finger millet and kodo millet
13. Novel carrier molecules for gene-editing system
14. Novel botanicals/biologicals for grain/seed treatment to control storage pests in ware house
15. Designing 'superbag' for seed storage/preventive rancidity

## **Theme II: Crop and Natural Resource Management**

16. Organic approaches for weed management
17. Improvement of crop recovery after drought/flood
18. Rapid increase in Soil Organic Carbon (SOC) content
19. Easy-to-Use soil biological testing kits for rapid soil health assessment
20. Real-time soil testing kit for quantitative soil health assessment (Electrochemistry/Spectroscopy)
21. Precision biomolecule delivery for crop health management using nanocarriers
22. Assessing greenhouse gas emissions through remote sensing
23. Crops/varietal identification using satellite data
24. Crop health and yield assessment using satellite/drone data
25. Defoliants for mechanical harvesting
26. Chemical interventions/treatments to reduce sucrose degradation associated with delayed harvest of sugarcane
27. Growth-regulators/biostimulants to achieve rapid growth in sugarcane
28. Soil amendments for reducing Electrical Conductivity (EC)
29. pH stability challenges in liquid biofertilizers
30. Next-Gen biofertilizer: Microbial consortium for multi-nutrient delivery
31. Farm scale desalinization of irrigation water
32. Integrated mobile app linking '*Tamil Manvalam*' recommending crops suitable for specific soil types for a specific location

### **Theme III: Crop Protection**

33. Ways to increase pollination/fruit set in vegetable/fruit cultivation (sunflower, mango, gourds)
34. Repellents for mitigating wild boars
35. Scarer for birds swarming agricultural crops
36. Developing eco-friendly pheromone lures to manage fruit flies in the horticultural ecosystem
37. Rapid detection of pesticide residues in fruits, vegetables, and spices
38. Early diagnosis of coconut root wilt
39. Novel molecules for yellow mosaic disease (YMD) in black gram
40. Novel approaches for effective control of sugarcane Pokkah boeng disease
41. Innovative and holistic approaches for pest/disease forecast of major crops
42. Reduction of aflatoxin levels in groundnut

### **Theme IV: Agricultural Engineering**

43. Farm level, low cost, solar-powered low temperature storage systems for short term as fruits, vegetables and flowers, Improvisation of existing IARI storage models
44. Cost effective pulp/juice extractor for tomato and water melon at farm level
45. Combine harvester for pulses
46. Groundnut digger cum stripper
47. Small scale sugarcane harvester
48. Sensors for food spoilage/storage pests
49. Food formulations to address health issues
50. Value addition in fruits and vegetables
51. Innovative technologies for reducing post-harvest losses
52. Bio-colorants from fruits and vegetables for food industry
53. Low-cost waste/polluted water treatment for agriculture (EcoClean Irrigation)
54. Newer methods and technologies in micro irrigation systems (Next-Gen Micro Irrigation Systems)
55. Solar powered low temperature storage systems for short-term preservation of perishable produces (Green refrigerator)
56. Artificial intelligence driven approaches for weed control
57. Innovative grain moisture/ chalkiness assessing digital device affordable to farmers

### **Theme V: Horticulture**

58. Extending shelf life of flowers and fruits
59. Low-cost structures for protected cultivation
60. Off season production in jasmine, tomato and moringa
61. Universal nutrient solution for vegetable cultivation
62. Low-cost biodegradable inputs for kitchen garden
63. Efficient and timely processing of coir-pith for use in kitchen garden
64. Affordable canopy management in high density planting (HDP)
65. Innovative plant propagation techniques such as precision grafting
66. Identifying new flower or fruit crops enabling diversity and meeting export market

### **Theme VI: Agricultural Marketing**

67. Innovative tools to address market glut in tomato, onion, etc.
68. Price forecasting information system for agricultural crops
69. Innovative Supply Chain Models for Vegetables and Fruits
70. Traceability Tools for Niche Products