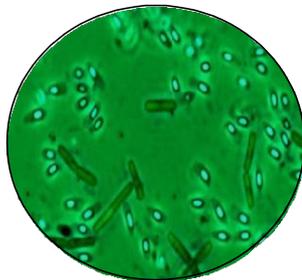


Technologies For Commercialization

1. Bacterial Entomo-Pathogen Based Bio-Agent

Details:

- The formulation was developed using a Himalayan strain of a bacterium, which has shown high efficacy against the grubs.
- It is a gram +ive bacteria isolated from diseased white grubs, formulated in talc for field applications.
- *Bacillus cereus* WGPSB-2 caused 93% mortality of 2nd instar larvae of *A. dimidiata* in the lab and micro plot conditions.
- It will be an effective alternative for chemical pesticides which were used for the management of white grubs in the region.



2. VL Babycorn 1

Details:

- This variety has been developed by recurrent selection after two backcrosses from two elite populations VL Makka 16 and Murulia.
- CMVL Baby Corn 2 is a relatively early maturing (48-52 and 52-54 days for baby corns in plains and hills, respectively).
- High yielding (18-20 q/ha dehusked baby corn yield). Baby corn is ready for harvest in 50-52 days in mid-hills and 48-50 days in plains.
- The average length of baby corn is 7.5-8.0 cm, the diameter is 1.3-1.5 cm, and weight is 7-8 g and colour are light yellow.
- Plant height: 205-210 cm (mid hills), 175-180 cm (plains).
- The baby corns have the appealing appearance and pleasant taste.
- Its average yield (dehusked baby corn ear) is 12-15 q/ha. In addition, 325-385 q/ha green fodder can also be obtained. It also yields 250-300 q/ha green fodder from plants after harvesting of baby corns and an additional 75-80 q/ha in the form of green ear husks.
- It is moderately tolerant to Turcicum Leaf Blight.
- Suitable for All India cultivation. It has wide adaptability and is released Jammu & Kashmir, Himachal Pradesh, Uttarakhand, Punjab, Haryana, Delhi, UP, Maharashtra, Karnataka, Tamil Nadu, Telangana, Andhra Pradesh, Gujarat, Rajasthan, Chhattisgarh and Madhya Pradesh.
- These features make it a very suitable baby corn hybrid.



3. Central Maize VL Sweetcorn 1

Details:

- This variety has been developed from the cross VSL 4 x VSL 16.
- CMVL Sweet Corn 1 is a relatively early maturing (70-72 and 75-77 days for green cob in plains and hills, respectively).
- High yielding (100-110 q/ha green cob yield).
- The mean length and girth of dehusked green ears of CMVLSC 1 are 20.0 and 15.0 cm, respectively, and weight is 240 g.
- The average length of baby corn is 7.5-8.0 cm, the diameter is 1.3-1.5 cm and the colour are light yellow.
- Plant height: 190-195 cm (mid hills), 180-185 cm (plains).
- TSS content is 15.5-16.0%.
- Yields 250-300 q/ha green fodder from plants after harvesting of green ears and an additional 20-25 q/ha in the form of green ear husks. It has long cylindrical cobs with good husk cover.
- It is moderately resistant to turcicum and maydis leaf blight.
- These features make it a very suitable sweet corn hybrid. It has wide adaptability and is released Jammu & Kashmir, Himachal Pradesh, Uttarakhand, NE Hills, Punjab, Haryana, Delhi, Western UP, Karnataka, Tamil Nadu, Telangana, Andhra Pradesh, Gujarat, Rajasthan, Chhattisgarh and Madhya Pradesh.



4. Vivek Maize Hybrid 45

Details:

- This variety has been developed from the cross V 373 x V 390.
- It has the stay-green trait.
- It has long cylindrical cobs with good husk cover and bold grain (average 1000-grain weight is 335 g).
- Its grain is yellow in colour and semi-flint in texture. • Plant height: 200-205 cm.
- VMH 45 is an early maturing (85-90 days).
- High yielding (50-55 q/ha) hybrids.
- Suitable for cultivation in Jammu & Kashmir, Himachal Pradesh, and Uttarakhand.
- It is tolerant to Turcicum and Maydis Leaf Blight.
- Owing to their short duration, these hybrids can fit into various maize-based cropping systems prevalent in the country.



5. Vivek Maize Hybrid 53

Details:

- This variety has been developed from the cross V 407 x V 409.
- It has long cylindrical cobs with good husk cover and bold grain (average 1000-grain weight is 370 g).
- Grain: Yellow bold, semi-flint. • Plant height: 185-195 cm (mid hills), 150-160 cm (plains).
- Maturity: 85-90 days (mid hills), 80-85 days (plains).
- Yield: 50-60 q/ha.
- It is moderately resistant to Turcicum and Maydis Leaf Blight, Common rust (CR), Postflowering Stalk Rot (PFSR) and Brown Stripe Downy Mildew (BSDM).
- Suitable for cultivation in Jammu & Kashmir, Himachal Pradesh, Uttarakhand, Uttar Pradesh, Sikkim, Assam, Arunachal Pradesh, Manipur, Meghalaya, Mizoram, Nagaland, and Tripura.
- Owing to their short duration, these hybrids can fit into various maize-based cropping systems prevalent in the country.
- These hybrids also possess 'stay green' trait.



6. Vivek Millet Thresher-cum-Pearler

Details:

- Vivek Millet Thresher-cum-Pearler saves time, energy and reduces the drudgery of women farmers. It improves the quality of produce as compared to traditional method.
- A finger millet thresher cum pearler with a threshing capacity of 30-35 kg/h and pearling capacity of 60-65 kg grain/h was designed on the basis of physical properties of the grain.
- The threshing and pearling efficiency of thresher are 98.1 and 97.9 % respectively.
- The power required for operating the thresher cum pearler was 0.746 kW.
- For best performance, the thresher cum pearler should be operated at a cylinder speed of 1200 rpm with cylinder concave clearance 5 mm, increased canvas width of 2 mm, moisture content 10% for threshing and 8% for pearling.



7. Vivek QPM 9- An Early Maturing QPM Maize Hybrid

Details:

- This variety has been developed from the cross VQL 1 x VQL 2.
- Vivek QPM 9 is an early maturing (85-90 days).
- High yielding (50-55 q/ha) hybrids.
- Plant height is 160-170 cm.
- Its grain is yellow in colour and semi-flint in texture.
- Vivek QPM 9 showed 9-12% superiority in grain yield over Vivek Maize Hybrid 9.
- VQPM 9 is the QPM Version of Vivek 9 and has Tryptophan 0.83% (compared to 0.59% in Vivek 9), Lysine 4.19 %, Fe 37 ppm and Zn 29 ppm.
- It has long cylindrical cobs with good husk cover and medium bold grain (average 1000- grain weight is 325 g).
- It is moderately tolerant to Turcicum and Maydis Leaf Blight. All these features make Vivek QPM 9 a hybrid of substantial commercial potential in food as well as poultry and cattle feed industry.



8. VL Bean 2 (French Bean variety, vegetable type)

Details:

- Productivity Enhancement.
- Released for Uttarakhand Hills, Organic conditions by SVRC.
- Plant height: 40-45 cm Bush type.
- Maturity: 45-50 days--1st picking/harvest.
- Seed: Dark Brown with slight molting.
- Yield: 100-125 q/ha.
- Resistant to Root rot & moderate Resistant to anthracnose, angular leaf spot, and rust.



9. VL Gehun 829 (Dual Purpose Green Fodder cum Grain Variety)

Details:

- Recommended for rainfed early sown conditions of Himachal Pradesh, Jammu & Kashmir and Hill district of Uttarakhand.
- Duration: 208 (200-218 days),
- Average yield: 29.0 q/ha (Rainfed) & 40-45 q/ha (Irrigated).
- Fodder Yield: 70-9- q/ha by clipping the crop after 55-70 days after sowing (DAS) (Plains) 70-90 DAS (Hills).
- By giving one irrigation and 20 kg/ha N Top dressing around 40-43 q/ha grain yield can be harvested.
- Resistant to Yellow & Brown rust.



10. VL Insect Trap (Patent no IN290170): A low cost management tool for White grub

Details:

- This is a light weight hanging model, which is more user friendly and specific to white grub beetles.
- Fins of the trap are designed to give more reflection and increased hitting surface for the beetles, so more numbers of beetles are trapped.
- Weight of the trap is only ~2 kg and hence, can easily be carried to difficult regions.
- Energy saving CFL tube is used as light source, which attracts more number of beetles.
- Unlike other models it traps very less and negligible number of beneficial.



11. VL Lahsun 2

Details:

- It has been identified for Zone I (UK, HP & J&K).
- Mostly suitable for hills.
- VGP 5 out yielded (181.93, 184.35, and 190.60 q/ha) the national checks G 282, VL Garlic 1 and G 41 by 70.98, 48.87 and 44.74 percent, respectively.
- Average bulb Yield: 175- 250 q/ha.



12. VL Mandua 352

Details:

- Adaptation: All finger millet growing state except Tamil Nadu and Maharashtra.
- Grain: light copper.
- Panicle: Semi-compact, with incurved fingers.
- Maturity: 93-101 days.
- Average yield: 22-25 q/ha.
- Moderately resistant to finger and neck blast.



13. VL Paddy Thresher

Details:

- The machine is lightweight specially developed for the hilly region (35 kg) and can be operated manually by single man which is 1030 mm long and 630 mm wide.
- The height of the machine is 975 mm and the threshing speed of the machine is 350 rpm.
- The efficiency of the machine is 98%.
- It solves the problem of labor scarcity.
- The bullocks being used for threshing can be used for another farm operation.
- It ensures the threshing in time so which minimized the post-harvest losses.
- The machine is environmentally friendly, as it is pedal operated and socially acceptable by the farmers.



14. VL Shimla Mirch 3

Details:

- Productivity Enhancement.
- Capsicum variety having bright dark green, medium, bell-shaped fruits, which turn red on ripening.
- Released and notified of Uttarakhand.
- Plant height: 55-70 cm.
- Maturity: 70-100 days.
- Average green fruit yield is 250-320 q/ha.
- Organic condition: 150 (100-180q/ha) and Inorganic condition: 300 (200-300) q/ha.
- Tolerance to fruit rot (anthracnose), collar rot, and fusarium wilt.



15. VL Syahi Hal

Details:

- It is environment-friendly, cost-effective, completely metallic and lightweight plough.
- Its total weight is approximately 11.0 kg, this is also two in one type, in which both ploughing as well as leveling works can.
- It is more durable due to all metallic components.
- There is a frequent breakdown of the wooden hals, thereby interrupting the operation and wasting more time in repair.
- VL syahi hal saves times and cost of operation due to uninterrupted operations.



16. CMVL Baby Corn 2

Details:

- CMVL Baby Corn 2 is a relatively early maturing (48-50 and 52-54 days for baby corns in plains and hills, respectively).
- High yielding. The hybrid gave dehusked baby corn yield of 1725, 2492, 2163 and 2216 q/ha in Zone I, II, III & IV, respectively, in All India Coordinated Trials (2012- 15).
- Plant height: 205-210 cm (mid hills), 175-180 cm (plains).
- Average baby corn length is 7.5-8.5 cm, diameter is 1.3-1.5 cm, and weight is 7-8 g. Colour is light yellow and seed rows are straight.
- The baby corns have appealing appearance and pleasant taste.
- It is moderately tolerant to Turcicum Leaf Blight.
- These features make CMVL Baby Corn 2 a very suitable baby corn hybrid.
- Notified in 2017 for cultivation in Jammu & Kashmir, Himachal Pradesh, Uttarakhand, Punjab, Haryana, Delhi, UP, Maharashtra, Karnataka, Tamil Nadu, Telangana, Andhra Pradesh, Gujarat, Rajasthan, Chhattisgarh and Madhya Pradesh.



17. VL Metallic Plough

Details:

- The “VL Metallic Plough” is more durable and environment friendly it save trees like oak (*Quercus leucotrichophora*), Utish (*Alnus nepalensis*) etc. which is being used for making traditional plough.
- Provision for adjustment as per the height of operator, bullock and depth of ploughing has been provided in the “VL Metallic Plough”.
- Broad side (width) of the body (M.S. rectangle) has been changed to perpendicular to the beam for giving more strength and wings of the plough have been changed for the use in both irrigated and uplands.
- Provision of leveling field after ploughing has also been provided.
- Bolt with wing nut is provided to overcome any obstruction while ploughing. It can be easily opened and tightened with hand to remove any fault during operation.
- Working efficiency is higher in comparison to the traditional used wooden plough and is ergonomically better for bullocks as well as human.
- Operational cost is negligible with minimum wearing and tearing.
- Shear is made of EN40 material which reduce wear and tear, however, once shear gets torn off or damaged, can easily be replaced by new one



18. VL Maize Sheller

Details:

- The VL Maize Sheller is light in weight and can be easily transported by two persons from one field to other field.
- The cost of the VL Maize Sheller is very low and it is affordable to small farmers.
- VL Maize Sheller will reduce drudgery of farm women/farmer, will save time and enhance efficiency.



19. VL Maize hybrid 47

Details:

- It has long cylindrical cobs with good husk cover and bold grains (average 1000-seed weight is 310 g).
- Grain: Yellow, semi-flint.
- Plant height: 200-210 cm.
- Maturity: 85-90 days.
- Yield: 50-55 q/ha.
- It is moderately resistant to *turcicum* and *maydis* leaf blight and common rust, and resistant to brown stripe downy mildew and post flowering stalk rot.
- Suitable for cultivation in Jammu & Kashmir, Himachal Pradesh, Uttarakhand, Assam, Arunachal Pradesh, Manipur, Meghalaya, Mizoram, Nagaland, Sikkim and Tripura.
- Owing to their short duration, these hybrids can fit into various maize-based cropping systems prevalent in the country.



20. VL Maize hybrid 57

Details:

1. VL Maize Hybrid 57 is an early maturing hybrid (95-100 days in mid hills)
2. Plant height: 190-200 cm in mid-hills
3. High yielding: 55-60 q/ha
4. It has long cylindrical cobs with good husk cover and bold grains (average 1000-seed weight is 280 g)
5. Its grain is yellow in colour and flint in texture
6. It is moderately resistant to *turcicum* and *maydis* leaf blight
7. Notified in 2019 for cultivation in Jammu & Kashmir, Himachal Pradesh, Uttarakhand, Assam, Arunachal Pradesh, Manipur, Meghalaya, Mizoram, Nagaland, Sikkim and Tripura
8. Owing to its short duration, the hybrid can fit into various maize-based cropping systems prevalent in the country



VL Portable Polyhouse

Background

- Rainfall in higher hills is very high and the temperature in the winter goes down with snowfall which reduces the plant growth.
- In the prevalent permanent polyhouse, after 4 to 5 years of cultivation, the incidence of insects-pest and soil-borne diseases starts increasing which increases the cost of cultivation and the soil health is also deteriorated thus reducing the productivity.
- Changing the huge amount of soil is very costly and tedious while moving the permanent polyhouse from one to other fields involves considerable damage to the structure as well as high investment.

Technology Details

- Being portable will help in reducing the build-up of insect-pest and will not deteriorate the soil health.
- It will provide protection of crops from any adverse environment, increase in the production, will protect crops by preventing the entry of animals and birds, more crops will be grown throughout the year as per requirement.
- It can also be used for covering fish ponds during severe winter, drying of farm produce, covering of harvested material, etc. as per requirement, thus making the multiple use.
- Per unit time per unit area productivity will be increased.
- The VL Portable Polyhouse is recommended for Mid-Hills (1250 to 1800 meters AMSL) and for higher hills (1800 to 2500 meters AMSL).



VL Solar Drier

Background

- The conventional method of drying involves a lot of damage from birds, insects, monkeys and unexpected rainfall and reduced quality of end product.
- Non-utilization of surplus produces, facing the seasonal glut.
- Prevailing hi-tech facilities and equipment of drying are not affordable to the marginal and poor farmers in the region.
- The farmers need low capacity domestic solar drier which can solve the problem of prevailing power cuts in the region.

Technology Details

The Drier prevents damage from birds, insects, monkeys and unexpected rainfall during the drying process. The drier improves the quality of the end product. A successful enterprise can be run based on this principle which can easily utilize the surplus produce facing the seasonal glut. Using the drier, the farmer can sell the dried products at a higher price in off-seasons. Drier being an enclosed unit, the agricultural commodity/produce/food/ can be dried using solar thermal energy in a cleaner and healthier way. The drier will help marginal and poor farmers who can't afford hi-tech facilities and equipment to preserve their agricultural products and to eliminate the unwanted and unpredictable food spoilage due to lack of facilities in the region.



VL Vermi Compost Strainer

Background

- The conventional method of sieving of Vermicompost involves a lot of damage to the earthworms.
- There is no uniform size of vermi-compost granules.
- The worms, as well as undecomposed vermi-compost, do not separate in the same operation.
- The prevailing conventional method of vermicompost is a batch type and not continuous.
- The farmers need continuous low cost and lightweight solar/manual operated portable Vermicompost strainer which can solve the problem of prevailing power cuts in the region.

Technology Details

- The VL Vermi-compost Strainer prevents damage to earthworms.
- The sieved vermicompost is of uniform size.
- The worms, as well as undecomposed vermi-compost, get separated for further recycling.
- This is of continuous type and not batch type.
- It is a low cost, light in weight, solar/manual operated and portable suitable for hilly conditions.



VL Polytunnel

Background

- In hills, the frost during winter season is very common and the farmers face problems in preparing nursery of vegetables, flowers and other high value crops due to very slow germination and growth.
- In addition, the seedlings in nursery in their initial growth stage are more prone to the damage caused by frost, hails and snowfall.
- If nursery fails, there is not only economic loss to farmers in terms of very high cost of the seeds but also the resowing of nursery delays its transplanting in fields thus decreasing the total production.
- Thus, a polytunnel may be a cheap, suitable and profitable alternate for preparing nursery under such conditions and accordingly the Institute under the NICRA project has developed iron made “VL Polytunnel” as a protective structure for raising nursery of high value crops.

Technology Details

- The VL Polytunnel is of semi-circular shape (3.0 m length x 1.0 width x 0.5 m center height)
- This is made of round MS iron rods, MS angle and transparent polythene
- It covers ground area of 3 sq m.
- The VL Polytunnel will create a sort of microclimate that allows to grow various plants even when they are out of season
- It protects plants from frost, hails, heavy rains and snowfall, strong winds, hot and cold waves.
- In addition to its primary use in winter for nursery raising, the farmers can also use it for drying and covering their farm produce during rainy season.
- Its price is Rs. 2,500/-.

