भटमासको चरित्रीकरण लागि परिक्षण

धानको चरित्रीकरण लागि परिक्षण

Annual Report 2079/80 (2022/2023)

National Seed Science Technology Research Centre

NPSN: 012/080/81

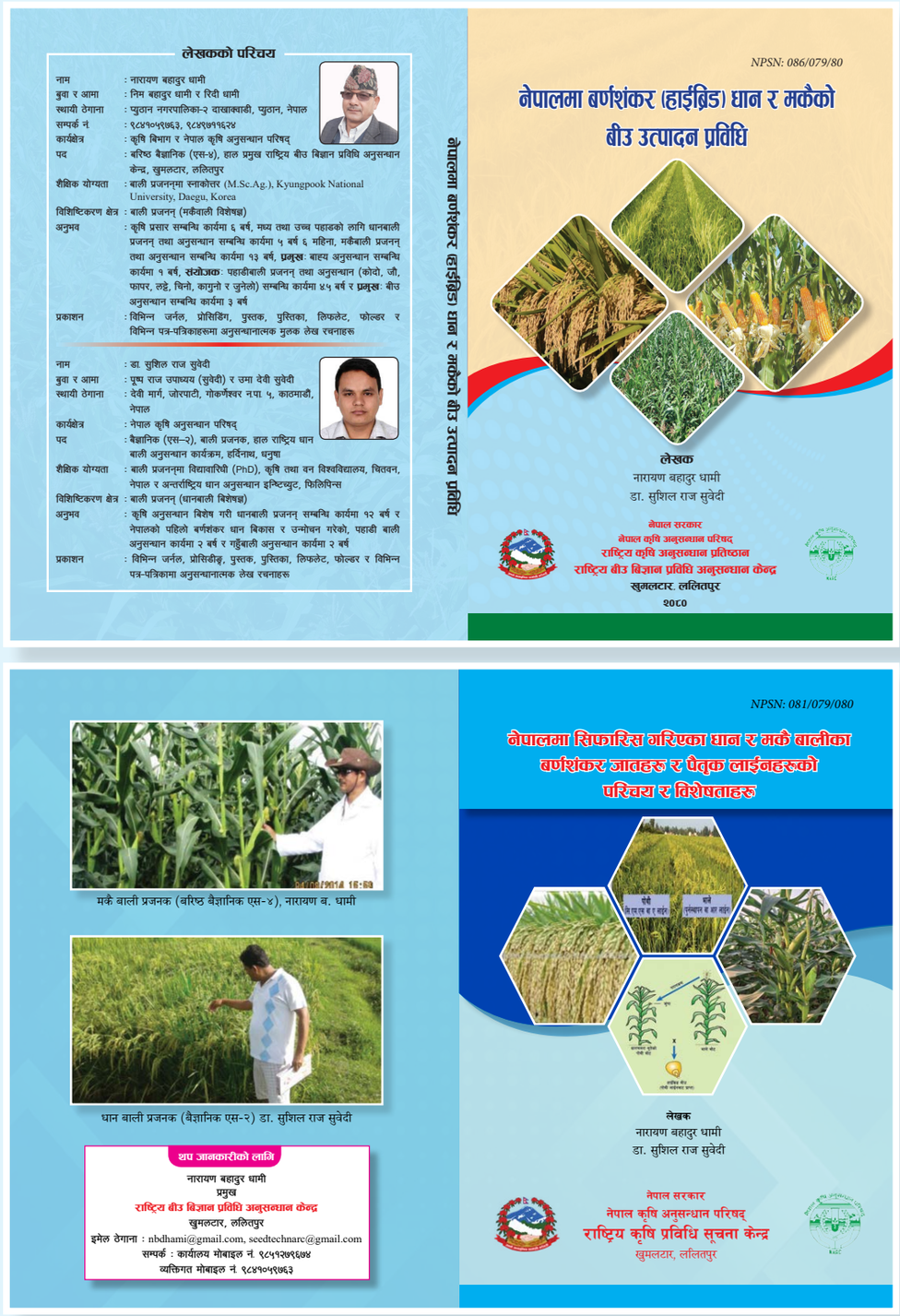
# Annual Report

## 2079/80 (2022/2023)


Government of Nepal
Nepal Agricultural Research Council
National Agricultural Research Institute
National Seed Science Technology Research Centre
Khumaltar, Lalitpur, Nepal

2023

# प्रकाशित पुस्तकहरू



# Annual Report

## 2079/80 (2022/2023)


**Government of Nepal**

**Nepal Agricultural Research Council**

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**National Seed Science Technology Research Centre**

**Khumaltar, Lalitpur, Nepal**



**2023**

## National Seed Science Technology Research Centre (NSSTRC)

National Agricultural Research Institute (NARI)

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- Dr. Pallavi Kumari Singh (Senior Scientist, S-4)

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**Cover Page Photo:**

Germination test of Soybean
Molecular Laboratory, NSSTRC, Khumaltar, Lalitpur.
Rice seedlings for DNA fingerprinting

# FOREWORD

It is my great pleasure to present the annual report 2079/80 of National Seed Science Technology Research Centre (NSSTRC) highlighting the accomplished major activities and their achievements in the fiscal year 2079/80. NSSTRC is the pioneer seed institution of Nepal started with country's first seed testing laboratory since 1962 at Khumaltar, Lalitpur. It still imparts seed quality testing services to the different seed stakeholders. It is working in collaboration and coordination with seed research groups, seed producers, distributing agencies, quality regulators, policy makers and seed users. NSSTRC has actively involved in undertaking problems based research on seed quality in a variety of crop species (field crops, horticultural crops, forage crops etc.) in different aspects viz., seed production, seed morphology, seed physiology, post-harvest handlings, storage and molecular level for diversity analysis. It also provides the technical supports/ services to strength national seed system using the quality seed which is produced within and outside the NARC.

Qualitative and quantitative characterization to develop descriptors and DNA finger printing of different released and pipeline crop varieties/ genotypes of cereals, pulses, oil seeds etc. for seed variety identification and maintenance breeding. Hybrid seed production of maize using different female to male ratios, technology generation on quality seed production of cereals were studied seed testing (germination, viability, moisture, purity etc) in laboratory during 2079/80. Source seed production by different commodity programs, DoAR and ARS were monitored to ensure the source seed quality.

I am thankful to Mr. Narayan Bahadur Dhami (former chief of NSSTRC) and all staffs of NSSTRC for their untiring hard works and meticulous efforts to accomplish the field research and laboratory works on time. My special thank goes to Mr. Arjun Prakash Poudel (S2) and Dr. Sarita Manandhar (S2) for compiling and presenting this report in this form. I would like to express my sincere gratitude to the Executive Director of NARC, Dr. Dhruba Raj Bhattarai, Director of Crops and Horticulture Research, Dr. Krishna Kumar Mishra; Director of Planning and Coordination, Dr. Luma Nidhi Pandey and Director of Financial Administration, Mr. Manas Kandel for their guidance and continuous support. I hope that, achievements of all activities presented in this report will useful to all researchers, extension workers, planners, policy makers, farmers, developmental partners, academicians, NGOs/INGOs, students and other stakeholders. I look forward to receive constructive comments and suggestion regarding this publication will be highly appreciated.

Dr. Pallavi Kumari Singh
Chief, NSSTRC, NARC, Khumaltar, Lalitpur

## ABBREVIATIONS & ACRONYMS

| | |
|---|---|
| ABD | Agriculture Botany Division |
| AFU | Agriculture and Forestry University |
| AKC | Agriculture Knowledge Centre |
| MASL | Above mean sea level |
| B | Boron |
| Bp | base pair |
| BS | Bikram Sambat |
| BW | Buckwheat |
| CBSP | Community Based Seed Production |
| CDD | Crop Development Directorate |
| CEAPRED | Center for Environmental and Agricultural Policy Research, Extension and Development |
| CS | Certified seed |
| CTAB | Cetyl- Trimethyl-Ammonium bromide |
| Cu | Cupper |
| CV | Coefficient of variation |
| DNA | Deoxyribonucleic acid |
| DoA | Department of Agriculture |
| DoAR | Directeorte of Agricultural Research |
| DoLS | Depatment of Livestock Services |
| DUS | Distinctness Uniformity and Stability |
| EC | Electrical conductivity |
| Fe | Iron |
| FFTs | Farmers' Field Trial |
| FS | Foundation seed |
| FY | Fiscal year |
| FYM | Farm yard manure |
| ha. | Hectare |
| HCRP | Hill Crop Research Program |
| HRs | Human Resources Strength |
| ISTA | International Seed Testing Association |
| JTA | Junior Techinical Assistant |
| $K_2O$ | Potassium oxide |
| LSD | Least Significant Difference |
| MAS | Marker Assisted Selection |
| MC | Moisture content |
| mg. | Milligram |
| mm | Millimeter |
| Mn | Manganese |
| Mo | Molybdenum |
| MoALD | Ministry of Agriculture & Livestock Development |
| N | Nitrogen |
| NAGRC | National Agronomy Research Centre |

| | |
|---|---|
| NARC | Nepal Agricultural Research Council |
| NARI | Nepal Agricultural Research Institute |
| NGO | Non-Government Organization |
| NGRC | National Genetic Resource Centre |
| NHA | Net Harvest Area |
| NMRP | National Maize Research Program |
| NPBGRC | National Plant Breeding and Genetic Research Centre |
| NR | Nepal Rice |
| NRRP | National Rice Research Program |
| NSB | National Seed Board |
| NSCL | National Seed Company Limited |
| NSSTRC | National Seed Science Technology Research Centre |
| NWRP | National Wheat Research Program |
| PCR | Polymerase Chain Reaction |
| PIC | Polymorphism Information Content |
| PICS | Purdue Improved Crop Storage |
| PMAMP | Prime Minister Agriculture Modernization Project |
| PPP | Public Privet Partnership |
| $P_2O_5$ | Phosphorus Pentoxide |
| PSQCC | Provincial Seed Quality Control Centre |
| RCBD | Randomized Complete Block Design |
| SCoT | Start Codon Targeted |
| SEAN | Seed Entrepreneurs Association Nepal |
| Se | Selenium |
| SPAD | Soil Plant Analysis Development |
| SQCC | Seed Quality Control Centre |
| SSR | Simple Sequence Repeat |
| SSTD | Seed Science & Technology Division |
| STIP | Seed Technology and Improvement Program |
| TE | Tris-EDTA |
| TGW | Thousand Grain Weight |
| UPOV | International Union for the Protection of New Varieties of Plants |
| UV | Ultraviolet Radiation |
| Viz; | Namely |
| WK | Wheat Khumal |
| Zn | Zinc |
| IS | Improved seed |
| (L.) | Linnaeus |
| @ | At the rate of |
| $^0C$ | Degree centigrade/degree celcius |

# संक्षिप्त बार्षिक प्रतिबेदन

यस बार्षिक प्रतिबेदनमा राष्ट्रिय बीउ बिज्ञान प्रबिधि अनुसन्धान केन्द्रको आ.ब. २०७९/८० को स्वीकृत बार्षिक कार्यक्रम अनुसार उन्मोचन भएका तथा उन्मोचन हुने क्रममा रहेका बालीहरु (धान, फापर, भट्टमास र गहुँ) को मात्रात्मक तथा गुणात्मक चरित्रिकरण विवरण तयार गर्ने, बर्णशंकर धान र मकैको उत्पादन प्रबिधि सम्बन्धि बृहत बाली प्रदर्शनी गर्ने र बीउ उत्पादन प्रविधि सम्बन्धि नेपाली भाषामा लेख रचना प्रकाशित गर्ने, बालीहरुको जातीय पहिचान गर्न डि. एन. ए. औँठाछाप तयार गर्ने, गुणस्तरीय बीउ उत्पादन प्रविधिको विकास गर्ने, खाद्यान्न बालीको श्रोत बीउ सुरक्षित भण्डारण गर्ने र विभिन्न सेवाग्राहीद्वारा तथा अनुसन्धान केन्द्रबाट पठाईएका बीउको नमुनाहरुको परिक्षण गर्ने सम्बन्धि परियोजनाका क्रियाकलापहरु संचालन गर्दा प्राप्त प्रतिफलहरु यस प्रतिवेदनमा निम्न अनुसार प्रस्तुत गरिएका छन् ।

- मध्य-पहाडको लागि उन्मोचन गर्न सकिने धान बालीका ७ वटा उत्कृष्ट जातहरु (एन. आर. १०६७६-बि-५-३, एन. आर. १११११५-बि-बि-३१-३, एन. आर. १११०५-बि-बि-२७, एन. आर. ११२७१-बि-बि-६, एन. आर. ११३२१-बि-बि-७-३, एन.आर. ११३०१-बि-बि-१, यु.एस ३१२ र खुमल ४) को चरित्रिकरण विवरण तयार गरियो।
- मध्य-पहाडको लागि उन्मोचन गर्न सकिने गहुँ बालीका १० वटा उत्कृष्ट जातहरु (डब्लु. के. ३२२३, डब्लु. के. ३३२१, डब्लु. के. ३५२३, डब्लु. के. ३५५०, डब्लु. के. ३०९२, डब्लु. के. ३११८, डब्लु. के. ३३२०, डब्लु. के. ३०१५, डब्लु. के. ३०२०, डब्लु. के. ३५३४) र तुलनात्मक जात डब्लु. के. १२०४ र च्याखुराको चरित्रिकरण विवरण तयार गरियो ।
- मध्य-पहाडको लागि उन्मोचन गर्न सकिने भट्टमासका ८ वटा उत्कृष्ट जातहरु (चैंग मो ६०६३, सि.एन.- ६०, जि.सि.-८२२३४-२२ सि, जी-४५०८, सि. एम.-९१३३, एल. एस.-७७-१६-१६, कलेक्सन #३ र कालो भट्टमास) को चरित्रिकरण विवरण तयार गरियो।
- मध्य-पहाडको लागि उन्मोचन गर्न सकिने फापरका ८ वटा उत्कृष्ट जातहरु (ए. सि. सि. # ६५०६, खुमल ७, बि. डब्लु.- एफ. एफ. टि. टि. बि., ए. सि. सि. # २२०१-२, काभ्रे बिटर, ए. सि. सि. # २२२७-१, ए. सि. सि. # २२२३-१ र ए. सि. सि. # २१९४) को चरित्रिकरण विवरण तयार गरियो ।
- सिन्धुपाल्चोक र काभ्रेपलान्चोक जिल्लाको मध्य-पहाड तथा बेशी टारमा तथा भकुन्डे कृषि बीउ बिजन सहकारी संस्था लि. काभ्रेपलान्चोक र यस केन्द्रको सहभागितामा सरकारी र निजि क्षेत्रको सहकार्यको अवधाराणा अनुरुप मकैको नेपाली बर्णशंकर जात (रामपुर हाइब्रिड-१०) ३ हे. र धानको हर्दिनाथ (हाइब्रिड-१) १ हे. क्षेत्रफलमा कृषकस्तरमा बृहत बाली प्रदर्शनी गर्दा मकैको औषत उत्पादकत्व ८.१३ मेट्रिक टन/हे. भएको पाईयो । त्यसैगरी धानमा हर्दिनाथ बर्णशंकर १ को उत्पादकत्व ८.०७ मेट्रिक टन/हे देखिएको छ । यी दुवै प्रदर्शन/परिक्षणमा संलग्न कृषकहरुको प्रतिक्रिया अनुसार यी दुवै बालीका जात त्यस क्षेत्रको लागि उपयुक्त देखिएकाले मध्य पहाडी भू-भागमा यिनीहरुको खेति प्रविधि बिस्तार गर्न सकिने देखियो।

- सुदूरपश्चिम प्रदेशमा **"गुणस्तरीय बीऊ उत्पादन तथा बजारिकरण"** सम्बन्धि १ दिने अन्तरक्रिया कार्यक्रम सम्पन्न गरियो । उक्त अन्तरक्रिया कार्यक्रममा प्रदेश कृषि मन्त्रालय/ बीउ बिजन प्रयोगशाला, सुदुरपश्चिम प्रदेश, कृषि ज्ञान केन्द्र, कैलाली, सुदुरपश्चिम प्रदेशका बीउ उत्पादक सहकारीहरु/ बीउ कम्पनीहरु/बीउ उत्पादक कृषक समूह/गैर सरकारी संस्था (लिबर्ड) /एग्रोभेट आदि गरि जम्मा ३२ जना सहभागीहरुको उपस्थिति रहेको थियो । गुणस्तरीय बीऊ उत्पादन तथा बजारिकरणमा देखिएका समस्याहरु र सरकारी तवरबाट गर्नु पर्ने पहलकदमी बारे गोष्ठीमा सहभागी सरोकारवाला हरुले कुरा उठाएका थिए ।
- विभिन्न एस एस आर मार्करको प्रयोग गरि काउलीका ८ वटा, काक्रोका ८ वटा, करेलाका ८ वटा र जई घासका १९ वटा गरि ४३ वटा उत्कृष्ट तथा सिफारिस उन्मुख जातहरूको डी .ए.एन. औठा छापतयार गरियो ।
- नार्क अन्तर्गतका बिभिन्न केन्द्रहरु, कृषक एवं अन्य सरोकारवाला निकायहरु बाट संकलन गरिएको प्रमुख कोसेबाली र तेलबालीको २८४ वटा अनुसन्धान नमुनाहरुको प्रयोगशालामा परिक्षण गरियो । ती मध्ये निजि बीउ कम्पनी, कृषक समूहहरु र कृषि सहकारीहरु बाट संकलन गरिएका नमूनाहरुमा तोकिएको स्तर भन्दा चिस्यान प्रतिशत बढि भएको पाईयो भने नार्क अन्तर्गतका बाली बस्तु कार्यक्रमहरु र कृषि अनुसन्धान केन्द्रहरुबाट संकलन गरिएका नमुनाहरुको चिस्यान प्रतिशत तोकिएको स्तर अनुसार नै पाईयो ।
- नार्क अन्तर्गतका केन्द्र तथा बाली बस्तु कार्यक्रमहरुद्वारा उत्पादन गरिएको श्रोत बीउको बासलात तयार गर्ने उद्देश्यले विकास गरिएको सफ्टवेयरको अभिमुखीकरण गराई श्रोत केन्द्रहरु संग सफ्टवेयर बारे पृष्ठपोषण समेत लिईयो ।
- केन्द्र द्वारा प्रबिधि प्रसार गर्ने उद्देश्य अनुरुप १०० प्रति "नेपालमा बर्णसंकर (हाईब्रिड) धान र मकैको बीउ उत्पादन प्रबिधि" र राष्ट्रिय कृषि प्रबिधि सूचना केन्द्रको आर्थिक सहयोगमा संचार तथा २०० प्रति "नेपालमा सिफारिस गरिएका धान र मकै बालीका बर्णसंकर जातहरु र पैत्रिक लाईनहरुको परिचय र बिशेषताहरु" सम्बन्धि पुस्तिका नेपाली भाषामा तयार गरि प्रकाशन तथा बिक्रि वितरणको लागि तयार पारियो । त्यसैगरि यस केन्द्रको आ.व २०७९/८० मा भए गरेका कामहरुको प्रतिफल प्रस्तुत गर्ने उद्देश्यका साथ ७५ प्रति बार्षिक प्रतिवेदन प्रकाशित गरियो ।
- विभिन्न सरोकारवाला निकायबाट प्राप्त भएका जम्मा १६८ वटा सेवा नमुनाहरु प्रयोगशालामा परिक्षण गरि सरोकारवालालाइ नतिजा उपलब्ध गराइयो। त्यसैगरी केन्द्रीय कृषि प्रयोगशाला, हरिहर भवनबाट समय समयमा प्राप्त दक्षता नमुनाहरु प्रयोगशालामा परिक्षण सम्पन्न गरि सोको नतिजा केन्द्रीय कृषि प्रयोगशाला, हरिहर भवनमा पेश गरियो।

## EXECUTIVE SUMMARY

This is the Annual report of National Seed Science Technology Research Centre (NSSTRC), NARC for the fiscal year 2079/80 (2022/2023). There were five research projects on problems related to quality seed production, varietal identification and verification of hybrid seed production technology of maize and demonstration of hybrids of maize and rice with PPP model. Experiments were carried out in field as well as in the laboratory of NSSTRC, Khumaltar. Major research areas were; seed production, genuineness of crop varieties and their morphology, DNA finger printing and seed quality enhancement techniques. Crops under study were rice maize, wheat, fingermillet, soyabean and buckwheat. The key findings of these research studies are as follows:

- Descriptors of 7 mid hill rice genotypes (NR 10676-B-5-3, NR 11115-B-B-31-3, NR 11105-B-B-27, NR 11271-B-B-6, NR 11321-B-B-7-3, NR 11301-B-B-1, US 312 and Standard check - Khumal 4) prepared.
- Descriptors of ten promising wheat genotypes viz; WK-3223, WK-3321, WK-3523, WK 3550, WK 3092, WK-3118, WK-3320, WK-3015, WK 3020 and WK-3534 and released variety Chyakhura and check WK-1204 prepared.
- Descriptors of 8 mid hills genotypes of soyabean (Chaingmow 6063, CN-60, GC-82234-22 C, G-4508, CM-9133, LS-77-16-16, Coll. #3 and Black Soyabean) prepared.
- Descriptors of 8 promising genotypes of buckwheat (ACC# 6506, Khumal-7, B.W-F.F.T.T.B, ACC # 2201-2, Kabre bitter, ACC # 2227-1, ACC # 2223-1 and ACC # 2194) prepared.
- In collaboration with farmers' of Kavrepalanchowk, Sindhupalchowk and Bhakunde Krishi Biubijan Sahakari Sanstha Limited, Kabhreplanchok (PPP model), Nepali hybrid maize (Rampur Hybrid 10) and Nepali hybrid rice (Hardinath hybrid-1) were demonstrated in area of 3 ha and 1 ha respectively under farmers field. On an average 8.13 t/ha grain yield was found in demonstration block of hybrid maize variety Rampur Hybrid 10. Similarly 8.07 t/ha grain yield of hybrid rice namely Hardunath Hybrid 1 was found in demonstration block of hybrid rice at Kuntabesi of Kavrepalanchowk and Neupanetar of Sindhupalchowk district. Performance of Rampur Hybrid 10 of maize and Hardinaath hybrid-1 of rice was excellent in both districts. The performance of these hybrids and positive feedback from farmers, verification of maize hybrid (Rampur hybrid-10) was found successful in mid-hill and foot hills of Kavrepalanchowk and Sindhupalchowk districts.

- One day interaction programs in the topic of "Quality Seed Production and Marketing" were organized in Dhangadi, Kailali of Sudurpaschim provinces. Altogether 32 enterpreneur farmers, seed company representative, AKC, Kailali, seed producer group, cooperatives, agrovet representative, provincial ministry, seed laboratory representative, LiBIRD representative and other concern stakeholders were participated the interaction program. Quality seed production and marketing related issues were discussed thoroughly in that workshop. Feedback from the concern stakeholders were collected to maintain supply chain of seed.
- DNA finger prints of 8 bittergourd genotypes, 8 cucumber genotypes, 8 cauliflower genotypes and 19 oat genotypes prepared by using different SSR markers.
- A total of 284 seed samples of major grain legumes and oilseed were collected from formal and non-formal seed sectors and analysed in NSSTRC seed laboratory. Among these samples, moisture content was found high in private seed producers, co-operatives and farmers also. On the other hand moisture content and germination percentage was found optimum under NARC stations.
- NSSTRC developed the software to prepare balance sheet of source seed produced by NARC commodity programs and stations. The orientation program about the data recording was organized by NSSTRC and feedback of software was collected from different source center of NARC.
- 100 copy book on the topic of "*Hybrid Rice and maize Seed Production Technology"* was published in Nepali language. Likewise 200 copy booklets on *"Varietal Characteristic of Released Hybrid Rice and Hybrid Maize"* were published with the financial support from National Agricultural Technology Information Center, Khumaltar, Lalitpur. Similarly, 75 copy *Annual Report* was published and distributed to present the results of projects conducted by NSSTRC during the FY 2079/80.
- A total of 168 service seed samples were analyzed and their report was provided to respective stakeholders. Similarly different proficiency samples were analyzed and their report was submitted to central seed lab Harihar bhawan.

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# 1. WORKING CONTEXT

National Seed Science Technology Reseach Centre (NSSTRC) is one of the important discipline under National Agricultural Research Institute (NARI) of Nepal Agricultural Research Council (NARC) located at Khumaltar (1335 amsl; 85°10′ E and 27°39′ N). It is featured to lead the research and review on the problems relating to seed quality, seed physiology, seed production, seed health, harvesting, processing, sampling, pre-and post-harvest management. Seed enhancement technology, variety identification, genetic purity evaluation, testing for genuineness of plant variety, development of seed quality assessment procedures, human resource development, and seed quality testing are the research areas of the centre. It embarks on the research works on these disciplines and provides services ensuring the production and supply of quality seed to farmers in a right place and time and helps in achieving a good harvest.

In the present context of depleting land and increasing population, we have to produce adequate food to address the hungry mouths. It is the established fact that use of quality seed maintains required plant population and uniform maturity leading to increasing yield by 15-20 percent. Basic and applied researches on seed science and technologies relating to seed quality, seed biology, seed management, seed quality enhancement, pre-harvest and post- harvest management, seed distribution and support in activities related to seed policies and regulations are the areas dealt during the year as core research activities. Consequently it works in collaboration with different institutions/programs with seed component and involved in dissemination about use and supply of quality seed in the country. Major collaborative institutions are Seed Quality Control Centre (SQCC), Department of Agriculture (DoA), Provincial Seed Quality Control Cetre (PSQCC), Crop Directorate of Development and Agriculture Biodiversity Conservation Center, National Seed Company Limited (NSCL), SEAN, CEAPRED, LiBIRD, Private Seed Companies, Universities, Seed Cooperatives, CBSP groups and farmers.

# 2. INTRODUCTION

## 2.1 Introduction and Background

Seed Science and Technology Research Unit was established as first seed testing laboratory in 1962 in Agronomy Division under the Department of Agricultural Development (DoAD). It got accredited to the International seed Testing Association (ISTA) in 1964. In early seventies, seed testing laboratory moved to Agriculture Botany Division (ABD) to work in close with the breeders. Seed Technology and Improvement Program (STIP), Central Seed Science and Technology Division (CSSTD) were the upgraded modalities and given the divisional status for bridging between research, extensions and end users of seed through seed certification, field inspection, seed testing, seed technology research and planning and monitoring of source seed production. On inception of Nepal Agricultural research Council (NARC), Seed Research as a Unit merged again in ABD and is entitled to conduct seed research on practical problems and support in strengthening national seed system in use and distribution of quality seed.

Seed Science and Technology Division (SSTD) as an independent division under NARI had approved by the 41st NARC Council meeting. It had been effective as central division of seed in Khumaltar from 2010/11 fiscal year. Later on in fiscal year 2019/20, 59th NARC Council meeting changed its name as "National Seed Science Technology Research Centre (NSSTRC)" with mandates. It acts as focal center for seed components in NARC assisting the use and production of quality seed through research for agricultural development and works on seed in close association and coordination with stakeholders of seeds under National Seed Board (NSB).

## 2.2 Objectives

- To carry out the seed technology research on problems associated with quality seed on seed production, harvesting, post-harvest handlings, storage, seed morphology and seed physiology based on seed quality testing protocols.
- To develop and standardize seed testing techniques through research supporting the seed certification system.
- To establish and coordinate the source seed production in NARC farm/stations and its distribution.
- To provide seed testing services to seed producers, seed companies, I/N/GOs with seed component, research entities, farmers etc.
- To work in close collaboration with the different stakeholders (central and provincial) of national and provincial level on seed problems in coordination with seed quality control centre, central seed testing laboratory and provincial seed testing laboratory.

## 2.3 Mandate

- Promote and prioritize seed sector research and development.
- Develop road map, directives and monitor of seed science related programme at national level.
- Monitoring and evaluation of source seed production and seed quality under NARC stations.
- Preparation of seed science related programme and policies to support national seed system.
- Conduct research on seed quality, seed testing and provide DNA finger printing service.
- Capacity building of manpower involved in seed sector research and development.
- Coordinate, liaise and collaborate with national and international organizations under the directives of NARC.

## 2.4 Thematic thrust areas for research

Seed is the most essential and viable input in agriculture. Quality seed leads to increase in production and productivity by 15 to 20 %. Its quality is affected by biotic and abiotic factors at various stages during production, harvesting, post-harvest handlings and storage. Based on agricultural research priorities and practical problems demanded by time, space (location specific) and clients, following basic and adaptive research areas on seed technology with practical implication have been identified.

### 2.4.1 Seed Production Technology

Seed production follows a definite sequence of steps and needs constant surveillances and immediate actions. Introduction of new varieties like hybrid, inbred, forage varieties; diverse cropping systems, cultivation of a range of crop species with different biology, climate change and incidence of diseases/pests and their threats are major factors that may create problems in seed production. Seed crop physiology, crop husbandry, the biology of seed maturation, role of minerals and micronutrients are the important aspects in seed production which requires intensive research for harvest of quality seed. Following points should be considered to adopt the quality seed production:

- Appropriate site selection
- Suitable varieties/genotypes
- Optimum isolation distance
- Optimum fertilizer dose
- Regular monitoring and field inspection
- Rouging
- Harvesting
- Processing

- Seed certification / Truthful labeling
- Storage

### 2.4.2 Seed Testing Technology and Seed Physiology

Seed testing for moisture %, germination% and purity% is carried following the methods standardize by ISTA. Testing determines the planting value of seed. Timely filed inspection and lab testing procedures are required for seed certification and truthful labeling. However, discrepancies in test results do occur in seed testing. In these circumstances, the center undertakes research to develop the appropriate testing technology in availing the assessment of quality seed and supports to develop the seed standards.

### 2.4.3 Seed Morphology and Taxonomy

Genetic purity is one of the quality attributes of seed. It is maintained through isolation, field inspection and physical purity and pre and post-harvest control plot tests at laboratory. It is necessary to undertake the practical researches and develop the distinguishing and identifying characters of each named varieties to avoid the genetic contamination in the standing up field and seed. The center, therefore undertakes the genuineness cultivar testing through agro-morphological characterization, biochemical and molecular testing.

### 2.4.4 Seed Post Harvest, Handling and Storage Technology

Seed is a living material which deteriorates time over and finally dies. Seed processing, drying, seed moisture%, seed treatment, seed storage containers, storage condition and mechanism of seed dissemination have great effect on seed viability and longevity. The center facilitates in carrying research on these areas and it has also an experience of working in collaboration with the national and international seed technology institutions.

### 2.4.5 Seed Variety Identification Using DNA Finger Printing Technology

DNA finger printing is a new advancement tool in molecular techniques and its application helps breeders and seed analysts in crop research, conservation of biodiversity and seed varietal identification. The centre is providing DNA finger printing using SSR marker in cereals, legumes and vegetable crops for variety release and registration process.

### 2.4.6 General Seed Testing

Following quality testing services are provided to seed producers, groups, seed companies and researchers etc.

- Moisture test
- Physical purity test
- Germination test
- 1000 grain weight test
- Proficiency seed sample test.

### 2.4.7 Special Seed Testing

Special seed testing services are provided in the laboratory. For special seed testing following testing services are provided.

- Tetrazolium salt test
- Vigor test
- Viable test
- Cold testing
- Ageing test
- Biochemical test
- DNA fingerprinting

## 2.5 Major Activities

- Biochemical test for varietal identification of vegetable species for genuineness of cultivars.
- Descriptors of pre-release varieties were developed based on agro-morphological traits.
- Establishment of seed production technology as per seed production environment.
- DNA fingerprinting using SSR marker for identifying genetic diversity among promising genotypes of different crops.

## 2.6 Major Achievements

- DNA fingerprinting of *Garima* variety of rice was done and documented.
- Suitable hermetic storage structures (Super grain bag, PICS bag and Safe grain bag) identified for grain storage.
- Zeolite beads identified as suitable drying storage tool for vegetables and high value crops.
- Seed germination percentage and viability increased if maize seed and roasted wheat is kept in ratio is 5-6:1 in air tight container or plastic bag.
- Seed pre-treatment techniques for rice, finger millet, *Sesbania* etc. established to break the seed dormancy/hard seed.
- Genetic and physiology of seed dormancy in improved rice varieties identified using SSR markers.

## 2.7 Infrastructure and facilities

The centre has its own two floor office building but top floor is using by NARI, Khumaltar, Lalitpur (annex 3). This centre has seed testing/research laboratory, molecular laboratory and field for other research activities. It is equipped with the seed quality testing facilities and molecular marker testing at DNA level. It provides seed testing services of all kinds of agricultural, horticultural and forage crop species to farmers, seed producers,

seed companies, researchers and provides analyzed reports following the rules for testing seeds by ISTA, 2011 and guidelines and norms developed by national seed regulatory body under NSB. Analytical purity test, moisture test, germination test are the general testing services whereas accelerated ageing test of wheat, cold test of maize, tetrazolium test, biochemical test for varietal identification (phenol and potassium iodide-iodine tests) and pre and post field plot tests are the special tests providing by the centre. The centre has strengthened the molecular testing facilities for carrying out the genuineness test of the crop varieties using DNA molecular markers and some time these facilities are also used in studying the genetic diversity of agricultural crops specific to landraces diversity. These facilities are listed in annex 4.1 and 4.2.

The centre also provides technical backstopping to SQCC in developing seed testing procedures, seed standards, field standards and minimum quality standards and assists in planning of source seed demand and supply. The centre generates database on seed and seed related other matters and coordinate the NARC seed component among the seed stakeholders.

### 2.8 Organizational structure and human resource

Following figure 1 explains the organizational structure of NSSTRC. It explains the working modality figure 2 and human resources strength (HRs) to help in achieving the objectives and strategies of the centre. The centre has ten staffs namely; one senior scientist (S-4), two scientists (S-2), one technician (T-5), one administrative officer, (A-6), one account officer (A-6), three lower technicians (T-1) and one light driver. Similarly, two skill manpower are working in seed testing laboratory and molecular laboratory. They are hired by NSSTRC. Details of human resource is given in annex 5.

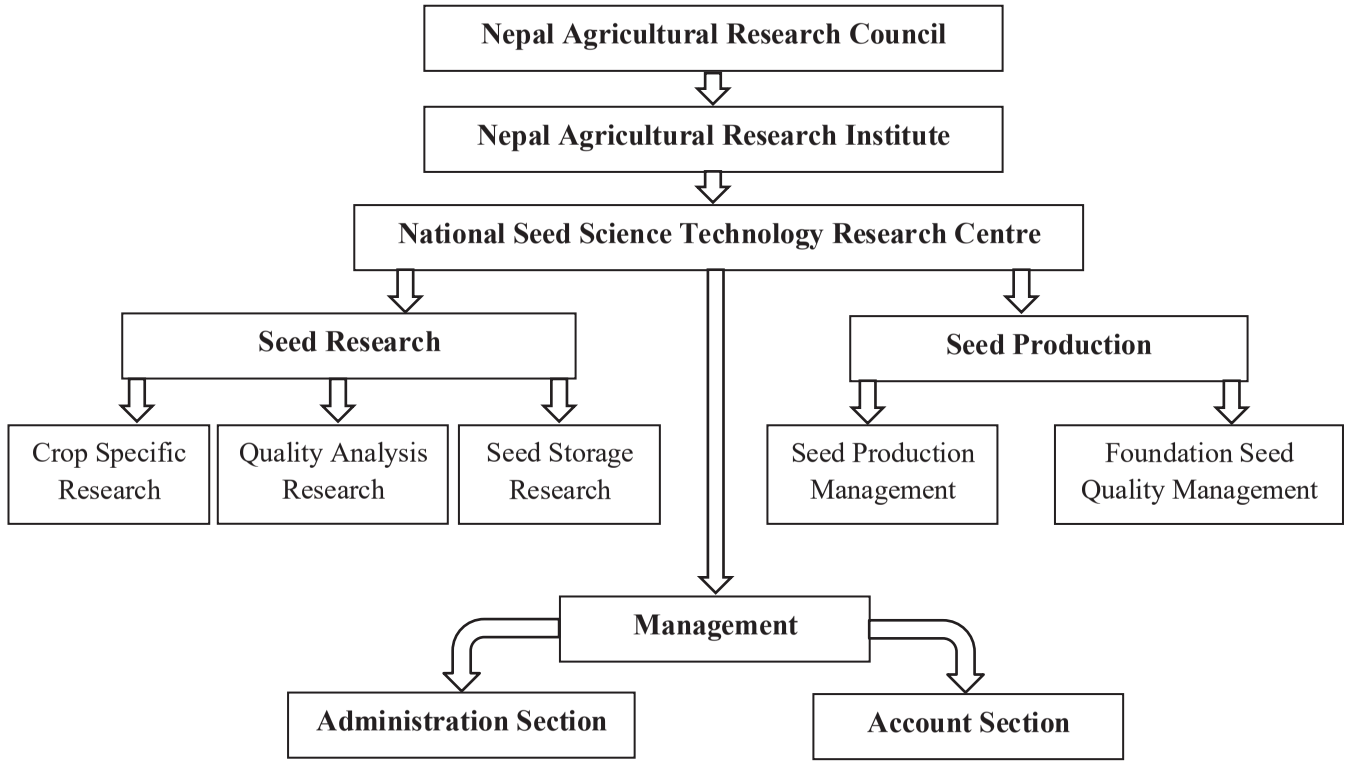


**Figure 1**: Organogram of NSSTRC

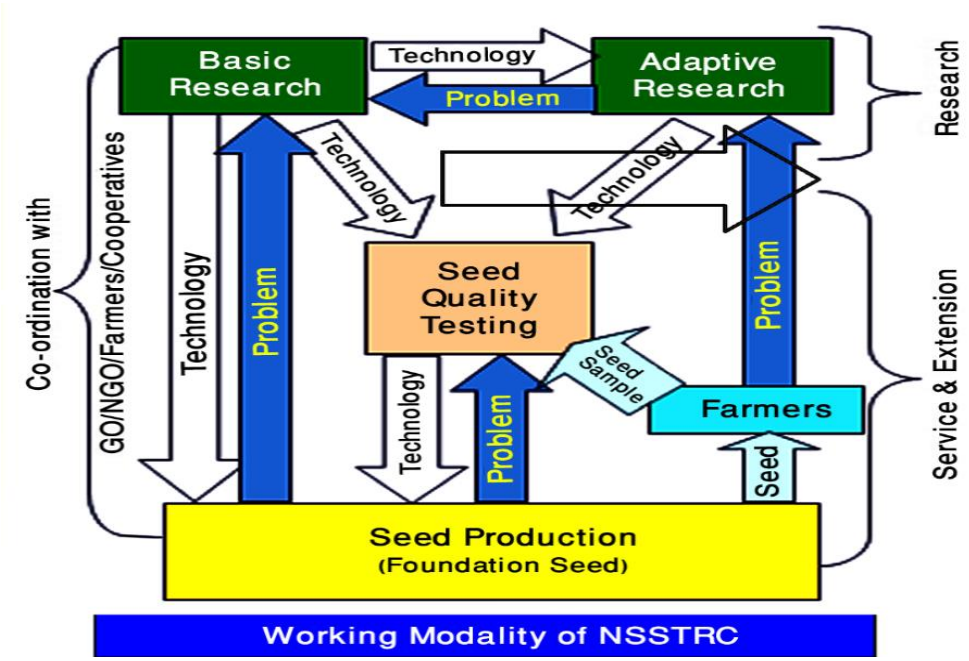


**Figure 2**: Working modality of NSSTRC

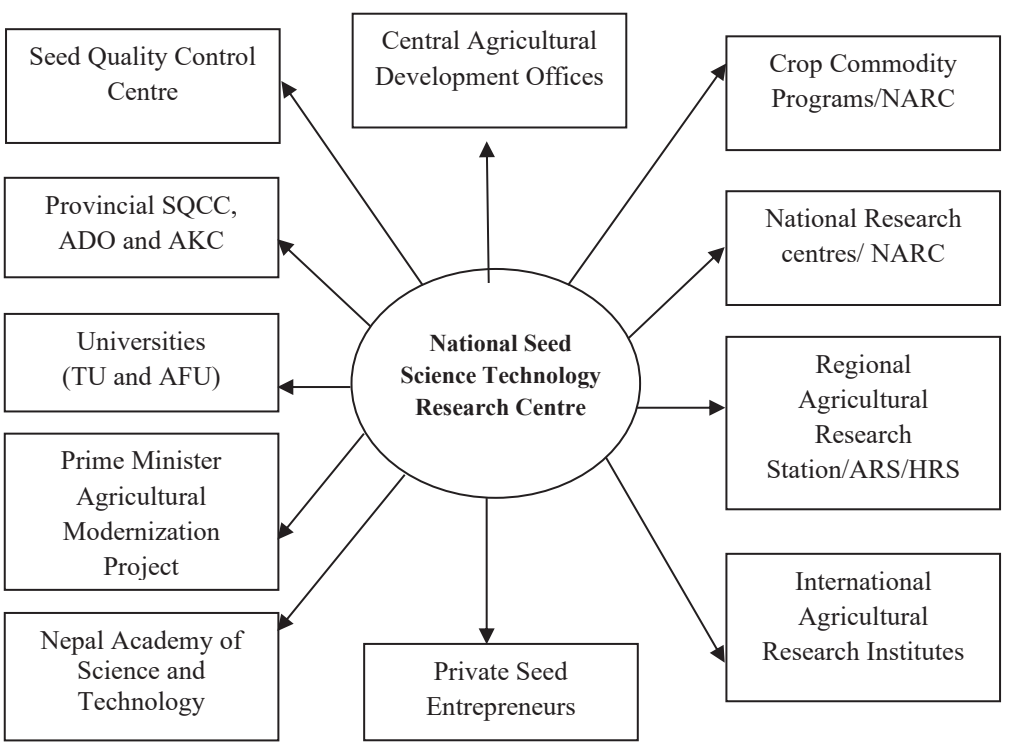


**Figure 3:** Linkage and coordination, NSSTRC

## 3. RESEARCH HIGHLIGHTS

The summary of progress report of fiscal year 2079/80 of different projects under NSSTRC, Khumaltar, Lalitpur are presented in Annex 6. The details of individual projects is explained as below.

### 3.1 Qualitative and quantitative characterization of pre-release promising genotypes of agricultural crops

#### 3.1.1 Agro-morphological characteristics study of rice genotypes for hill environment

**Introduction:**

Rice (*Oryza sativa* L.) is one of the most important food crop among the cereals in Nepal. It occupies an area of 1,477,378 ha with the production of 5,130,625 mt and productivity of 3.5 t/ha and contribution of 1.6% to the agricultural GDP in FY 2079/80 (MOALD 2023).there are many newly developed rice varieties/genotypes that are suitable to different agro-ecological zones. The newly developed varieties must be distinct, uniform and stable (DUS) which are mainly identified with respect to their morpho-physiological attributes. However, with the use of high yielding varieties/genotypes and new technologies, it has become a great threat to secure the traditional varieties and landraces which may have immense potential for different important traits.

Repeated use of the same breeding lines with similar genetic base in variety development program not only narrow down the genetic base but also invite new problems associated with biotic and abiotic stresses. Therefore, variety development should consider the qualitative and quantitative characterization of pre-release promising genotypes of rice crops. Qualitative characters are considered as morphological markers in the identification of landraces and improved varieties of rice because they are less influenced by the environmental changes. The rice pure lines which possess exclusive variability and unique features need to be conserved and utilized in future rice breeding program to develop new rice varieties for issues like intellectual property rights. So, the objective of this research is to develop descriptors of the promising rice genotypes for mid-hill condition that helps the seed producers, crop inspectors, crop inspectors and respective commodity breeders to maintain genetic purity and to support the variety release and registration process.

**Materials and method:**

Eight promising rice genotypes viz. NR-11271-B-B-6, NR-11105-B-B-27, NR-11115-B-B-31-3, NR-11301-B-B-1, NR-11321-B-B-7-3, NR-10676-B-5-3, US-312 and Khumal-4 (check) from National Plant Breeding and Genetic Resource Centre (NPBGRC), Khumaltar were tested for agro-morphological characterization during summer season 2079-80. The experiment was laid out in RCBD with three replication at Khumaltar. The individual plot size was $4m^2$ with the spacing of 20 cm x 15 cm. Seedlings were raised in dry bed nursery using 50 kg seed/ha. Transplanting was done in puddled field on $16^{th}$ Asar 2079 with the recommended fertilizer dose of 120:40:40 NPK kg/ha. Half dose of N and

full dose of P and K was applied as basal dose and the remaining N was top dressed in two splits, first at the time of maximum tillering and second at booting stage. Intercultural operations were carried out at different crop growth stages as and when required. All the required data were recorded from the net harvested area of 2.4 $m^2$ from each plot. The qualitative and quantitative traits were recorded according to UPOV guidelines.

The quantitative data were analyzed using RStudio. Analysis of variance (ANOVA) for RCBD was used to calculate treatment means, standard errors and significant differences between treatments means (RStudio Team 2023). Statistical testing of treatment mean separation for significant data was done using Fisher-LSD test at $p<0.05$.

**Results and discussion:**

**Variation in qualitative traits among the rice genotypes**

Clear and noticeable variations in most of the qualitative traits among the eight rice genotypes were observed (Table 1). The leaf senescence time was late in three rice genotypes NR-11321-B-B-7-3, NR-10676-B-5-3, US-312 while others showed intermediate leaf senescence. Similarly, the culm was erect only in two rice genotypes NR-11321-B-B-7-3, and US-312 while the remaining had semi-erect culm habit. The panicle was well exserted in all seven rice genotypes except in NR-11271-B-B-6 (just exserted). The details of the variable traits among the genotypes are listed in Table 1.

**Table 1. Qualitative variation among the rice genotypes**

| Traits/ Genotypes | NR-11271-B-B-6 | NR-11105-B-B-27 | NR-11115-B-B-31-3 | NR -11301-B-B-1 | NR-11321-B-B-7-3 | NR-10676-B-5-3 | US-312 | Khumal-4 (check) |
|---|---|---|---|---|---|---|---|---|
| Leaf intensity of green colour | Green | Green | Green | Light green | Dark green | Light green | Dark green | Light green |
| Flag leaf attitude of blade (Early) | Semi erect | Erect | Semi erect | Semi erect | Erect | Erect | Semi erect | Erect |
| Flag leaf attitude of blade (Late) | Semi erect | Semi erect | Semi erect | Semi erect | Erect | Erect | Semi erect | Semi erect |
| Culm habit | Semi erect | Semi erect | Semi erect | Semi erect | Erect | Semi erect | Erect | Semi erect |
| Stem anthocyanin coloration of nodes | Absent | Absent | Absent | Absent | Present | Absent | Absent | Absent |
| Male sterility | Low | Low | Low | Low | Low | Low | Low | Low |
| Stem intensity of anthocyanin colouration of nodes | Light green | Light green | Light green | Light green | Black | Light green | Green | Light green |
| Panicle attitude in relation to stem | Semi upright | Semi upright | Semi upright | Semi upright | Semi upright | Semi upright | Erect | Semi upright |
| Panicle exsertion | Just exserted | well exserted | well exserted | well exserted | well exserted | well exserted | well exserted | well exserted |
| Time of leaf senescence | Intermediate | Intermediate | Intermediate | Intermediate | Late | Late | Late | Intermediate |
| Decorticated grain shape in lateral view | Medium | Medium | Medium | Long | Medium | Short | Medium | Medium |
| Decorticated grain colour | White | Slightly brown | White | Slightly purple | White | Slightly purple | White | Slightly brown |

**Variation in quantitative traits among the rice genotypes**

Significant variations were observed in many of the quantitative traits among the rice genotypes (Table 2). Significant differences were shown by the leaf blade length, glume length, peduncle length, panicle length, plant height, days to heading and maturity. The rice genotype US-312 was significantly late maturing (132 days) and smallest in plant height (104.4 cm), glume length (0.78 mm), leaf blade length (33.3 cm), peduncle length (2.5 cm), higher panicle length (27.2 cm) compared to other genotypes. However, the grain yield and number of tillers per plant showed no significant differences among the rice genotypes with an average of 6.8 t/ha grain yield and 8.7 tillers/plant, respectively.

**Table 2. Quantitative variation among the rice genotypes**

| Genotypes | LBL (cm) | LBW (cm) | GL (mm) | LL (cm) | PeL (cm) | PL (cm) | PH (cm) | Tiller no /plant | HD | MD | GM (%) | GY (t/ha) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **NR-10676-B-5-3** | 33.5$^{c}$ | 1.6 | 0.93c$^{de}$ | 0.7 | 7.8$^{a}$ | 26.3$^{ab}$ | 156.9$^{a}$ | 10.7 | 84$^{b}$ | 129$^{b}$ | 20.9 | 6.4 |
| **NR-11115-B-B-31-3** | 39.7$^{ab}$ | 1.8 | 1.27$^{ab}$ | 1.0 | 8.7$^{a}$ | 25.9b$^{c}$ | 155.3$^{a}$ | 8.3 | 83$^{bc}$ | 127$^{cd}$ | 18.7 | 5.9 |
| **NR-11105-B-B-27** | 35.2b$^{c}$ | 1.4 | 0.94$^{cde}$ | 0.8 | 7.9$^{a}$ | 25.5$^{bc}$ | 139.9$^{b}$ | 8.0 | 78$^{e}$ | 128$^{bc}$ | 18.2 | 7.1 |
| **NR-11271-B-B-6** | 43.2$^{a}$ | 1.7 | 1.09$^{bcd}$ | 1.1 | 10.1$^{a}$ | 26.1$^{ab}$ | 154.4$^{a}$ | 7.9 | 81$^{cd}$ | 127$^{cd}$ | 19.2 | 6.8 |
| **NR-11321-B-B-7-3** | 34.9$^{bc}$ | 1.6 | 0.89$^{de}$ | 2.2 | 8.5$^{a}$ | 25.3$^{bc}$ | 132.5$^{c}$ | 9.2 | 79$^{de}$ | 128$^{bc}$ | 19.4 | 7.3 |
| **NR-11301-B-B-1** | 37.8a$^{bc}$ | 1.6 | 1.39$^{a}$ | 0.9 | 10.3$^{a}$ | 25.7$^{bc}$ | 155.7$^{a}$ | 8.7 | 80d$^{e}$ | 127$^{cd}$ | 18.9 | 7.0 |
| **US-312** | 33.3$^{c}$ | 1.7 | 0.78$^{e}$ | 0.9 | 2.5$^{b}$ | 27.2$^{a}$ | 104.4$^{d}$ | 8.8 | 88$^{a}$ | 132$^{a}$ | 20.1 | 7.5 |
| **Khumal-4 (check)** | 39.3$^{abc}$ | 1.6 | 1.20$^{abc}$ | 0.8 | 10.9$^{a}$ | 24.9$^{c}$ | 155.8$^{a}$ | 8.1 | 81$^{cd}$ | 126$^{d}$ | 18.5 | 6.0 |
| **Grand mean** | 37.1 | 1.6 | 1.1 | 1.1 | 8.3 | 25.9 | 144.4 | 8.7 | 82.0 | 128.0 | 19.2 | 6.8 |
| **P value** | * | ns | ** | ns | ** | * | *** | ns | *** | *** | ns | ns |
| **LSD (0.05)** | 6.2 | - | 0.3 | - | 3.2 | 1.1 | 5.6 | - | 2.7 | 1.9 | - | - |
| **CV (%)** | 9.5 | 12.7 | 15.4 | 93.2 | 22.3 | 2.5 | 2.2 | 18.8 | 1.9 | 0.87 | 7.2 | 12.4 |

**Note:** *PH=Plant Height, PeL=Peduncle Length, PL=Panicle Length, GL= Glume Length, LL= Ligule Length, HD=Heading Days, MD=Maturity Days, GY=Grain Yield, GM=Grain Moisture,* LBL=*Leaf blade length, LBW= Leaf blade width*

**Conclusion:**

There was noticeable differences in the qualitative traits of the tested rice genotypes and few traits similar to the check variety Khumal-4. The tested genotypes showed non-significant differences for grain yield, and number of tillers per plant. However, US-312 was observed to be significantly late maturing genotype (132 days) and smallest plant height (10.4 cm) followed by NR-10676-B-5-3 (129 days), NR-11105-B-B-27 (128 days), NR-11321-B-B-7-3 (128 days) compared to the check Khumal-4 with maturity in 126 days.

### 3.1.2 Agro-morphological characteristics study of soybean genotypes for hill environment

**Introduction:**

Agro-morphological characterization of promising genotypes of soybean as a series of work had been carried out and the descriptors of the soybean genotypes to support identification, release, seed production and inspection activities under seed certification

program. It is a continuous project activity with the objective of determining the agro-morphological variability in qualitative and quantitative traits (DUS) for preparing the descriptors of genotypes of soybean for mid-hill conditions to the support the national variety release process.

**Materials and method**

Eight different genotypes of soybean were tested for the agro-morphological characterization at Khumaltar, Lalitpur. The genotypes were Chaingmow 6063, CN-60, GC-82234-22C, G-4508, CM-9133, LS-77-16-16, Coll#3 and Black soybean (as local check) from NPBGRC, Khumaltar. A total of eight treatment/genotypes were randomized and tested in three replication with RCBD design. Soybean were sown at the spacing of 50 cmx 10 cm on 2079/02/04 with the individual plot size of 9 $m^2$ (3 m x 3 m). The recommended dose of fertilizer 30:60:30 NPK kg/ha was applied at the time of sowing. All the required qualitative and quantitative traits were recorded according to UPOV guidelines.

The quantitative data were analyzed using RStudio. Analysis of variance (ANOVA) for RCBD was used to calculate treatment means, standard errors and significant differences between treatments means (RStudio Team 2023). Statistical testing of treatment mean separation for significant data was done using Fisher-LSD test at $p<0.05$.

**Results and discussion:**

**Variation in qualitative traits among the soybean genotypes**

There was variation in nineteen different qualitative traits among the soybean genotypes tested at Khumaltar condition. The details of the variation in qualitative traits are shown in Table 3. Plant growth habit was semi-erect in all soybean genotypes except for CN-60. The hair density was from medium (G-4508) to very dense (Chiangmow 6063, LS-77-16-16 and Coll#3). The genotypes Chaingmow 6063, CN-60 and CM-9133 had white colored flower similar to the local check (black soybean) while the nodulation was medium (**CN-60** and **CM-9133)** to low (Chaingmow 6063, GC-82234-22C, G-4508, LS-77-16-16, Coll#3, Black soybean). The largest seed size was observed in the soybean genotype G-4508 while the smallest in CM-9133, LS-77-16-16 and Local Check which might affect the grain yield.

**Table 3. Qualitative variation among the soybean genotypes**

| Traits/ Genotypes | Chaingmow 6063 | CN-60 | GC-82234-22C | G-4508 | CM-9133 | LS-77-16-16 | Coll #3 | Local Check (Black soybean) |
|---|---|---|---|---|---|---|---|---|
| Plant growth habit | Semi erect | Erect | Semi-erect | Semi-erect | Semi-erect | Semi-erect | Semi-erect | Semi-erect |
| Plant colour of hair of main stem | Tawny | Tawny | Grey | Tawny | Tawny | Tawny | Tawny | Tawny |
| Hair density | Very dense | Dense | Dense | Medium | Dense | Very dense | Very dense | Very dense |
| Leaf blistering | Present-Medium | Small (weak) | Weak | Very strong | Medium | Medium | Absent | Weak |
| Leaf shape of lateral leaflet | Pointed ovate | Pointed ovate | Lenocote | Triangular | Pointed ovate | Triangular | Pointed ovate | Triangular |
| Leaf size of lateral leaflet | Medium | Medium | Small | Medium | Medium | Small | Medium | Medium |
| Leaf intensity of green colour | Dark green | Green | Dark green | Green | Green | Light green | Green | Light green |
| Flower colour | White | White | Purple | Purple | White | Purple | Purple | White |
| Pubescence colour | Brown-tawny | Brown-tawny | Grey | Brown-tawny | Brown-tawny | Brown-tawny | Brown-tawny | Brown-tawny |
| Pubescence habit | Semi-erect | Semi-erect | Semi-erect | Erect | Semi-erect | Erect | Erect | Erect |
| Mature pod colour | Dark brown | Brown | Brown | Dark brown | Light brown | Light brown | Brown | Light brown |
| Nodulation | Low | Medium | Low | Low | Medium | Low | Low | Low |
| Pod intensity of brown colour | Dark | Light | Dark brown | Dark | Light | Light | Medium | Medium |
| Seed size | Medium | Medium | Medium | Large | Small | Small | Medium | Small |
| Seed shape | Spherical | Elongated | Elongated | Spherical | Spherical | Spherical | Elongated | Spherical |
| Seed ground colour of testa | Yellow | Yellow | Yellow | Yellow | Yellow | Yellow | Brown | Black |
| Seed hilium colour | Yellow | Yellow | Yellow | Black | Yellow | Black | Black | Black |
| Seed coat colour | Yellow | Yellow | Yellow | Yellow | Yellow | Yellow | Yellow | Black |
| Seed coat surface lusture | Yellow | Yellow | Yellow | Yellow | Yellow | Yellow | Black | Yellow |

**Variation in quantitative traits among the soybean genotypes**

Significant differences were recorded only in maturity days, plant height, number of leaflet/plant, number of pods/plant among the soybean genotypes (Table 4). The genotype GC-82234-22c (108 days) and local check (111 days) were significantly early maturing while the genotype Coll#3 (126 days) matured late. All the tested soybean genotypes were significantly taller (70.3 cm to 98.5 cm) than the local check black soybean (46.7cm). Further, the genotype Coll#3 despite being significantly late maturing (126 days), was significantly tallest (98.5 cm) with significantly highest number of leaflet/plant (12.5) and number of pods/plant (205.2) compared to the other genotypes tested. Most of the genotypes were significantly superior in quantitative traits than the local check. However, the yields (biomass, grain and straw) and thousand grain weight (TGW) were not

significantly different among the genotypes with the average yield of 2 t/ha (biomass), 0.7 t/ha (grain), 1.3t/ha (straw) and126.3g (TGW) respectively.

**Table 4. Quantitative variation among the soybean genotypes**

| Genotypes | MD | PH (cm) | No of leaflet/plant | NMS | LL (cm) | LW (cm) | No pods/ plants | No of seed/pod | PoL (cm) | PoW (cm) | Moisture (%) | TGW (g) | BY (t/ha) | GY (t/ha) | SY (t/ha) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Chaingmow6063** | 114b | 74.1b | 9.5bc | 9.2 | 10.1 | 5.1 | 95.4bc | 2.8 | 4.5 | 1.5 | 11.6 | 95.5 | 2.3 | 0.8 | 1.5 |
| **CN-60** | 114b | 75.3b | 11.5ab | 10.2 | 10.4 | 4.8 | 127.8b | 2.7 | 4.4 | 1.0 | 11.5 | 142.4 | 2.1 | 0.7 | 1.5 |
| **GC-82234-22c** | 108c | 70.3b | 9.12bcd | 10.2 | 9.9 | 3.9 | 119.7b | 2.6 | 4.2 | 1.2 | 11.1 | 119.3 | 1.5 | 0.5 | 1.0 |
| **G-4508** | 112b | 81.5b | 6.5de | 13.1 | 11.1 | 5.7 | 110.0bc | 2.6 | 4.5 | 0.9 | 11.3 | 133.0 | 3.1 | 0.9 | 2.2 |
| **CM-9133** | 113b | 73.1b | 8.1cd | 13.1 | 11.1 | 4.7 | 106.1bc | 2.6 | 4.3 | 1.0 | 11.3 | 133.3 | 3.0 | 0.9 | 2.1 |
| **LS-77-16-16** | 112b | 75.8b | 8.5c | 14.6 | 9.3 | 5.3 | 124.2b | 2.7 | 4.4 | 1.0 | 11.5 | 114.3 | 1.5 | 0.5 | 1.1 |
| **Coll #3** | 126a | 98.5a | 12.5a | 10.9 | 11.6 | 5.1 | 205.2a | 2.1 | 3.7 | 1.0 | 11.6 | 128.6 | 1.9 | 1.1 | 0.8 |
| **Local Check (Black soybean)** | 111bc | 46.7c | 5.0e | 5.5 | 8.0 | 3.5 | 53.6c | 2.3 | 3.8 | 0.9 | 11.1 | 144.1 | 0.4 | 0.1 | 0.3 |
| **Grand Mean** | 114.0 | 74.0 | 8.8 | 10.8 | 10.2 | 4.8 | 117.7 | 2.6 | 4.2 | 1.1 | 11.4 | 126.3 | 2.0 | 0.7 | 1.3 |
| **P value** | *** | *** | *** | ns | ns | ns | ** | ns | ns | ns | ns | ns | ns | ns | ns |
| **LSD (0.05)** | 3.4 | 15.6 | 2.7 | - | - | - | 61.8 | - | - | - | - | - | - | - | - |
| **CV (%)** | 1.7 | 11.9 | 17.7 | 51.6 | 12.9 | 22.2 | 30.2 | 11.1 | 13.6 | 31.2 | 3.3 | 18.7 | 60.5 | 58.6 | 66 |

**Note:** *PH=Plant Height, LL=Leaf Length, LW=Leaf Width, PoL=Pod length, PoW=Pod Width, MD=Maturity Days, TGW=Thousand Grain Weight, BY=Biomass Yield,* GY=*Grain Yield,* SY=*Straw Yield*, *NMS=No of nodes on main stem*

## Conclusion:

In nutshell, all the tested soybean genotypes performed significantly better than the local check (Black soybean) but recorded no significant differences for the grain yield. There was noticeable variation in qualitative and quantitative traits among the soybean genotypes.

### 3.1.3 Agro-morphological characteristics study of wheat genotypes for hill environment

**Introduction:**

Breeding program of NPBGRC, Khumaltar has identified many promising lines of wheat for mid-hill conditions and every year a number of pre-release varieties are tested under farmer's field trials (FFT) and evaluated for different agronomic traits. Agro-morphological characterization of pre-release genotypes is a pre-requisite for variety release and registration process where a candidate variety must be distinct from the other reference varieties at one to many traits level. So, the objective of this trial is to determine the agro-morphological variability in qualitative and quantitative traits (DUS) for preparing the descriptors of wheat genotypes for mid-hill conditions to the support the national variety release process.

**Materials and method:**

A total of twelve different genotypes of wheat WK-3223, WK-3321, WK-3523, WK-3550, WK-3092, WK-3118, WK-3320, WK-3015, K-3020, WK-3534, WK-1204 and Chyakhura (check) were tested in Khumaltar for DUS purpose in 2079-80. All the twelve treatments were randomized and tested in the field in RCBD with three replications. Wheat sowing was done on 2079/08/14 with the seed rate of 120 kg/ha. The plot size was 3.75 $m^2$ (3 m x 1.25 m) with the net harvested area of 2.25 $m^2$ (3m x 0.75 m) for each treatment. Rows were spaced 25 cm apart with continuous sowing. Recommended dose of fertilizer was applied @ 120:60:40 NPK kg/ha. Half dose of n and full dose of P2O5 and K2O were applied as basal at the time of sowing. The remaining half dose of N was divided into two splits i.e. at tillering and booting stage. All the intercultural operation were done as and when required. All the required data were recorded from the net harvested area of 2.25 $m^2$ from each plot. The qualitative and quantitative traits were recorded according to UPOV guidelines.

The quantitative data were analyzed using RStudio. Analysis of variance (ANOVA) for RCBD was used to calculate treatment means, standard errors and significant differences between treatments means (RStudio Team 2023). Statistical testing of treatment mean separation for significant data was done using Fisher-LSD test at $p<0.05$.

**Results and discussion:**

**Variation in qualitative traits among the wheat genotypes**

There was variation in twenty-one different qualitative traits among the wheat genotypes tested at Khumaltar condition (Table 5). A lot of variation were observed within these qualitative traits among the genotypes. The foliage color varied from dark green (WK-3321, WK-3550, WK-3092, WK-3118, and WK-3534) to light green. The plant growth habit of wheat genotypes WK-3223, WK-3321, WK-3092, WK-3118, WK-3015, WK-

3534, and WK-1204 was erect similar to the check variety Chyakhura. While postrate growth habit was observed in the genotypes WK-3550, WK-3320, and WK-3020; and semi-erect growth in WK-3523. Most of the genotypes WK-3223, WK-3321, WK-3092, WK-3118, WK-3320, WK-3020, WK-3534, and WK-1204) showed ovate grain shape similar to the check Chyakhura while WK-3523, WK-3550, and WK-3015 had oblong grain shape. The details are presented in Table 5.

**Table 5. Qualitative variation among the wheat genotypes**

| Traits / Genotypes | WK - 3223 | WK - 3321 | WK - 3523 | WK - 3550 | WK - 3092 | WK - 3118 | WK - 3320 | WK - 3015 | WK - 3020 | WK - 3534 | WK - 1204 | Chyakhura |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Plant growth habit | Erect | Erect | Semi erect | Postrate | Erect | Erect | Postrate | Erect | Postrate | Erect | Erect | Erect |
| Foliage colour | Light green | Dark green | Green | Dark green | Dark green | Dark green | Green | Green | Light green | Dark green | Green | Light green |
| Waxiness of sheath | Very strong | Very strong | Medium | Very strong | Very strong | Strong | Very strong | Medium | Medium | Strong | Medium | Medium |
| Lower glume shoulder shape | Rounded | Straight | Oblique | Straight | Sloping | Sloping | Rounded | Sloping | Rounded | Straight | Straight | Straight |
| Lower glume shoulder width | Medium | Medium | Narrow | Medium | Very narrow | Very narrow | Medium | Absent | Medium | Medium | Medium | Medium |
| Apical rachis segment | Low | Medium | Present (dense) | Low | Medium | Low | Medium | Low | Low | Dense | Low | Low |
| Ear glaucosity | Very strong | Medium | Strong | Very strong | Very strong | Strong | Strong | Strong | Strong | Strong | Very strong | Very strong |
| Frequency of plants with recurved flag leaves | Medium | Medium | Low | Medium | Low | Low | Medium | Medium | Medium | Low | Low | High |
| Flag leaf attitude (Early obs) | Erect | Erect | Erect | Erect | Erect | Erect | Erect | Erect | Erect | Erect | Erect | Dropping |
| Flag leaf attitude (Late obs) | Drooping | Semi erect | Drooping | Semi erect | Semi erect | Semi erect | Drooping | Semi erect | Semi erect | Semi erect | Semi erect | Drooping |
| Flag leaf glaucosity of sheath | Medium | Medium | Medium | Medium | Strong | Strong | Strong | Medium | Medium | Very strong | Very strong | Medium |
| Culm glaucosity of neck | Very strong | Very strong | Strong | Very strong | Strong | Very strong | Very strong | Very strong | Very strong | Strong | Very strong | Very strong |
| Ear shape in profile | Tapering | Tapering | Parallel sided | Tapering | Tapering | Parallel sided | Parallel sided | Tapering | Tapering | Tapering | Parallel sided | Tapering |
| Ear density | Dense | Very dense | Very dense | Very dense | Very dense | Very dense | Dense | Dense | Very dense | Very dense | Dense | Medium |
| Scurs | Long | Long | Short | Long | Long | Short | Short | Short | Long | Long | Short | Long |
| Spike Attitude | Bent | Straight | Bent | Bent | Bent | Bent | Bent | Bent | Bent | Straight | Straight | Bent |
| Grain Mark | Present | Present | Present | Present | Absent | Present | Absent | Present | Present | Present | Present | Present |
| Grain shape | Ovate | Ovate | Oblong | Oblong | Ovate | Ovate | Ovate | Oblong | Ovate | Ovate | Ovate | Ovate |
| Germ size width | Medium | Medium | Medium | Medium | Medium | Narrow | Medium | Medium | Narrow | Narrow | Narrow | Medium |
| Brush size | Mid sized | Small | Small | Mid sized | Small | Small | Mid sized | Small | Small | Small | Small | Small |
| Brush length | Medium | Short | Medium | Medium | Short | Short | Medium | Medium | Short | Short | Short | Medium |

**Variation in quantitative traits among the wheat genotypes**

The yield attributing parameters like seed/spike, spike length, plant height, and TGW showed significant differences among the wheat genotypes (Table 6). Plant height (111.1

cm) and spike length (13 cm) was significantly higher in the genotype WK-3015 while the genotypes WK-3118, WK-3534 showed significantly higher seed/spike of 77.8 and 69.8, respectively. The TGW significantly ranged from 58.2 g (WK-3550) to 31.9 g (WK-3020) among the genotypes. This might be the reason for the non-significant differences in grain and straw yield among the wheat genotypes (Fig. 4). Further, the average grain yield and straw yield among the wheat genotypes were 3.9 t/ha, and 9.9 t/ha, respectively. With respect to the maturity, the genotype WK-3321 (149 days) was significantly early and WK-3015 (168 days) significantly late compared to the other tested genotypes.

**Table 6. Quantitative variation among the wheat genotypes**

| Genotype | FLW (cm) | AL (cm) | PeL (cm) | Culm /plant | CD (mm) | Spikelet/ spike | Seed/ spike | SL (cm) | PH (cm) | TGW (g) | FD | MD |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| WK-3223 | 1.5 | 6.7$^{b}$ | 13.9 | 7.2 | 4.9$^{a}$ | 20.7 | 67.1$^{bcd}$ | 12.9$^{ab}$ | 111.01$^{a}$ | 51.2$^{cde}$ | 118 | 163$^{b}$ |
| WK-3321 | 1.4 | 4.0$^{e}$ | 13.3 | 7.3 | 4.5$^{abc}$ | 20.1 | 66.9$^{bcd}$ | 11.7$^{bc}$ | 99.5$^{cd}$ | 50.8$^{ced}$ | 115 | 149$^{c}$ |
| WK-3523 | 1.4 | 6.9$^{ab}$ | 10.9 | 7.4 | 4.4$^{abc}$ | 17.6 | 60.0$^{de}$ | 10.0$^{d}$ | 88.2$^{e}$ | 52.4$^{bcd}$ | 119 | 167$^{ab}$ |
| WK-3550 | 1.5 | 6.8$^{b}$ | 14.5 | 7.9 | 5.0$^{a}$ | 20.3 | 69.5$^{bc}$ | 12.1$^{abc}$ | 108.7$^{ab}$ | 58.2$^{a}$ | 113 | 163$^{b}$ |
| WK-3092 | 1.6 | 5.4$^{cd}$ | 14.2 | 7.2 | 4.5a$^{bc}$ | 21.6 | 68.3$^{bc}$ | 12.0$^{abc}$ | 101.9$^{ab}$ | 54.8$^{bc}$ | 113 | 163$^{b}$ |
| WK-3118 | 1.6 | 5.5$^{cd}$ | 13.4 | 6.1 | 5.0$^{a}$ | 21.5 | 77.8$^{a}$ | 11.4$^{cd}$ | 98.2$^{cd}$ | 39.1$^{f}$ | 115 | 165$^{ab}$ |
| WK-3320 | 1.5 | 6.7$^{b}$ | 11.6 | 7.1 | 4.9$^{a}$ | 19.5 | 61.5$^{cde}$ | 10.4$^{d}$ | 104.1$^{abc}$ | 47.5$^{e}$ | 120 | 166$^{ab}$ |
| WK-3015 | 1.5 | 6.5$^{b}$ | 10.7 | 6.5 | 4.4$^{abc}$ | 22.5 | 60.6$^{de}$ | 13.0$^{a}$ | 111.1$^{a}$ | 46.9$^{e}$ | 114 | 168$^{a}$ |
| WK-3020 | 1.5 | 7.8$^{a}$ | 11.9 | 7.1 | 3.8$^{c}$ | 22.6 | 56.0$^{e}$ | 12.0$^{abc}$ | 109.9$^{ab}$ | 31.9$^{g}$ | 121 | 163$^{b}$ |
| WK-3534 | 1.5 | 4.5$^{de}$ | 14.8 | 6.5 | 4.4$^{abc}$ | 29.5 | 69.8$^{ab}$ | 11.2$^{cd}$ | 92.1d$^{e}$ | 48.5$^{cde}$ | 109 | 165$^{ab}$ |
| WK-1204 | 1.7 | 6.5$^{b}$ | 9.7 | 6.6 | 4.0$^{bc}$ | 20.1 | 62.5b$^{cde}$ | 11.3$^{cd}$ | 97.7$^{cd}$ | 49.5$^{cde}$ | 122 | 165$^{ab}$ |
| Chyakhura | 1.6 | 6.6$^{b}$ | 16.3 | 7.0 | 4.6$^{ab}$ | 20.3 | 62.2$^{bcde}$ | 11.5$^{cd}$ | 103.7$^{abc}$ | 47.2$^{e}$ | 119 | 166$^{ab}$ |
| Grand Mean | 1.5 | 6.2 | 12.9 | 7.0 | 4.5 | 21.3 | 65.2 | 11.6 | 102.2 | 48.2 | 117 | 164 |
| P value | ns | *** | ns | ns | * | ns | ** | ** | *** | *** | ns | *** |
| CV (%) | 8.3 | 8.9 | 23.3 | 19.9 | 9.5 | 21.8 | 7.4 | 6.4 | 4.4 | 5.3 | 1.4 | 1.7 |

**Note:** *PH=Plant Height, PeL=Peduncle Length, FD=50% Flowering days, MD=80% Maturity Days, TGW=Thousand Grain Weight,* FLW= *Flag Leaf Width,* AL=*Awn Length, CD=Culm diameter, SL=Spike Length*

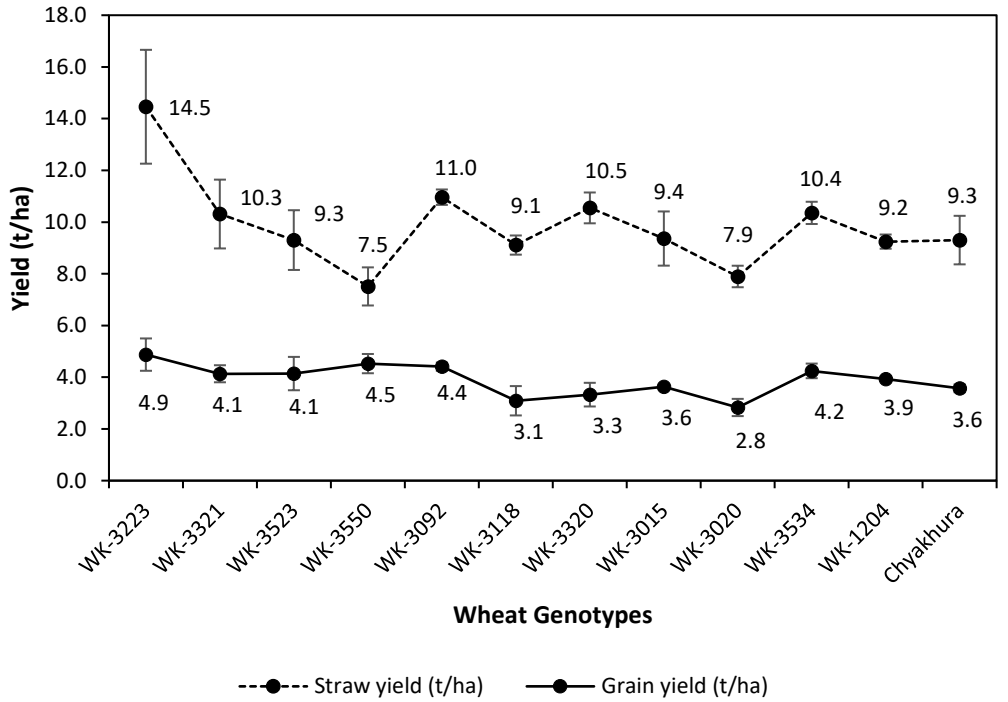


**Figure 4: Grain yield and straw yield as affected by different wheat genotypes**

**Conclusion:**

There was more variation in qualitative traits compared to the quantitative traits among the wheat genotypes. The grain yield showed non-significant differences among the wheat genotypes. However, the grain yield ranged from 2.8 t/ha (WK-3020) to 4.5 t/ha (WK-3550) among the wheat genotypes.

### 3.1.4 Agro-morphological characteristics study of promising genotypes of buckwheat (bitter type) for hill environment:

**Quantitative variation among buckwheat (bitter type) genotypes:**

## Materials and Methods:

A total of eight different bitter buckwheat genotypes ACC# 6506, Khumal-7, B.W-F.F.T.T.B, ACC# 2201-2, Kabre bitter, ACC# 2227-1, ACC# 2223-1 and ACC# 2194 were tested for DUS purpose. All genotypes were brought from Hill Crop Research Program (HCRP), Kabre, Dolakha and tested at Khumaltar. Genotypes were tested in plot size of 3.6 $m^2$ with spacing of continuous sowing of 25 cm row length. The seed rate was 50 kg/ha

with 30:20:10 kg NPK/ha of fertilizer dose. All the genotypes were randomized and tested in RCBD design. The sowing date was third week of September, 2022.

**Results:**

Quantitative variation were seen in tested genotypes in terms of different parameters like plant height, number of internode, stem length, stem diameter, thickness of stem tissue, length of cyme, no of flower cluster per cyme and number of cyme. Details of quantitative variation among the tested genotypes were seen in Table 7 below.

**Table 7: Quantitative variation among buckwheat (bitter type) genotypes**

| S. No. | Name of Genotypes | Plant heightt. (cm) | Number of internode | Stem length (cm) | Stem Diameter (cm) | Thickness of stem tissue (mm) | Length of cyme (cm) | No. of flower cluster/ cyme | Number of cyme |
|---|---|---|---|---|---|---|---|---|---|
| 1 | ACC# 6506 | 101.73 | 14.20 | 99.33 | 0.44 | 5.69 | 1.56 | 2.27 | 18.33 |
| 2 | Khumal-7 | 108.87 | 14.73 | 107.14 | 0.41 | 6.07 | 1.65 | 2.27 | 19.60 |
| 3 | B.W-F.F.T.T.B | 103.27 | 14.73 | 100.81 | 0.40 | 5.84 | 2.05 | 2.27 | 19.80 |
| 4 | ACC# 2201-2 | 101.60 | 14.07 | 152.79 | 0.41 | 4.94 | 1.79 | 2.27 | 15.00 |
| 5 | Kabre bitter | 112.60 | 14.07 | 110.07 | 0.42 | 5.22 | 1.83 | 2.33 | 17.47 |
| 6 | ACC# 2227-1 | 104.47 | 14.60 | 142.35 | 0.41 | 5.98 | 2.73 | 2.27 | 17.00 |
| 7 | ACC# 2223-1 | 104.53 | 13.67 | 102.22 | 0.41 | 5.20 | 1.70 | 2.20 | 19.60 |
| 8 | ACC# 2194 | 95.87 | 13.40 | 88.12 | 0.40 | 6.18 | 1.62 | 2.33 | 14.80 |
| | **Grand Mean** | **104.12** | **14.18** | **112.85** | **0.41** | **5.64** | **1.87** | **2.28** | **17.70** |

Similarly, days of flowering, maturity days, number of seeds/cyme, seed length/width, petiole length, 1000 grain weight, biomass yield and grain yield were analyzed for all genotypes of buckwheat (bitter type). Details of quantitative variation among the tested genotypes were seen in Table 8.

**Table 8: Quantitative variation among buckwheat (bitter type) genotypes**

| S. No. | Name of Genotypes | Days to 50% flowering | Days to 75% maturity | No. of seed /cyme | Seed length (mm) | Seed width (mm) | Petiole length (cm) | TGW (gm) | Straw yield (kg/ha) | Grain yield (kg/ha) |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | ACC# 6506 | 32 | 102 | 35.13 | 4.84 | 2.71 | 3.79 | 20.49 | 623.46 | 775.31 |
| 2 | Khumal-7 | 31 | 103 | 33.13 | 5.05 | 2.86 | 4.58 | 20.54 | 919.75 | 1175.31 |
| 3 | B.W-F.F.T.T.B | 33 | 92 | 37.07 | 4.77 | 2.70 | 3.71 | 19.29 | 672.84 | 824.69 |
| 4 | ACC# 2201-2 | 29 | 96 | 31.07 | 4.78 | 2.78 | 4.22 | 18.25 | 679.01 | 637.04 |
| 5 | Kabre bitter | 35 | 105 | 33.53 | 5.15 | 2.85 | 6.33 | 19.98 | 987.65 | 817.28 |
| 6 | ACC# 2227-1 | 32 | 93 | 34.60 | 4.68 | 2.75 | 3.98 | 18.68 | 518.52 | 675.31 |
| 7 | ACC# 2223-1 | 31 | 95 | 32.00 | 5.14 | 2.83 | 4.65 | 19.60 | 759.26 | 1086.42 |
| 8 | ACC# 2194 | 35 | 104 | 29.07 | 4.79 | 2.66 | 3.90 | 18.75 | 753.09 | 779.01 |
| | **Grand Mean** | **32** | **99** | **33.20** | **4.90** | **2.77** | **4.40** | **19.45** | **739.20** | **846.30** |

***Note:*** *TGW=Thousand Grain Weight*

### 3.1.3.2 Qualitative variation among buckwheat (bitter type) genotypes

Regarding qualitative traits, stem colour, seed shape, seed surface, petiole colour, seed flavor, leaf margin colour were found different among the tested genotypes. Other qualitative traits like leaf colour was found green, leaf vein colour was red, leaf flavor was sour, stamens longer than style in terms of flower morphology in all tested genotypes. Similarly seed colour was brown and seed coat colour was found greenish yellow and seed quality was good in all genotypes tested in the field. Threshability was intermediate, cotyledon/seedling leaf colour was found green, growth and branch shoot habit was found semi-erect, degree of determination was determinate with strong plant branching and intermediate lodging suscepitbality in all genotypes tested for characterization of qualitative traits. Details of the results are given in Table 9.

**Table 9: Qualitative variation among buckwheat (bitter type) genotypes**

| S. No. | Genotypes | Stem colour | Seed shape | Seed surface | Petiole colour | Seed flavour | Leaf margin colour |
|---|---|---|---|---|---|---|---|
| 1 | ACC#6506 | Pink | Ovate | Smooth | Pink | Bitter | Pink |
| 2 | Khumal-7 | Red | Ovate | Smooth | Red | Bitter | Red |
| 3 | B.W-F.F.T.T.B | Pink | Triangular | Smooth | Pink | Bitter | Pink |
| 4 | ACC#2201-2 | Pink | Triangular | Irregular | Pink | Sweet | Pink |
| 5 | Kabre bitter | Red | Triangular | Smooth | Red | Sweet | Red |
| 6 | ACC#2227-1 | Red | Ovate | Smooth | Red | Bitter | Red |
| 7 | ACC#2223-1 | Red | Ovate | Smooth | Red | Bitter | Red |
| 8 | ACC#2194 | Red | Ovate | Smooth | Red | Bitter | Red |

## 3.2 Seed variety identification using DNA finger printing technology

### 3.2.1 Genetic diversity analysis of different bitter gourd varieties using Simple Sequence Repeat (SSR) markers

**Introduction:**

Bitter gourd or bitter melon (*Momordica charantia* L.; 2n= 2x=22), which belongs to the family Cucurbitaceae, is a critical vegetable basically esteemed for its nutritional and medicinal properties. Bitter Gourd has been used for centuries within conventional pharmaceutical of Nepal and other countries like China, India, Africa, and Latin America. Moreover, bitter Gourd natural products have anti-oxidant, anti-microbial, anti-viral, anti-diabetic properties. Evaluation of genetic diversity based on phenotype has limitations, since most of the morphological characters of economic importance are significantly impacted by environmental conditions and plant developmental stage. In contrast, molecular markers based on DNA sequence polymorphisms are independent of environmental conditions and show a higher level of polymorphism. Despite posing considerable benefits, limited work has been performed to study this crop in molecular level. In the present study, eight bitter gourd accessions of Nepal were analyzed for diversity study at molecular levels using fifteen SSR markers with the following three objectives; (i) discriminate among accessions of diverse origin; (ii) characterize genetic relationships among and between accessions, and; (iii) to determine the relative efficacy of these marker systems for population analysis.

**Materials and methods:**

A total of 8 genotypes of bitter gourd namely; VI049945, VI043052, Morang Local X VI049945, Manju Local, Seto Local, Seto Local X VI049945, Green Local, and Green Local X VI049945 were used for the study. Sample seeds were collected from National Horticulture Research Centre (NHRC), NARC, and Khumaltar, Nepal. Bulk DNA was extracted using CTAB (Cetyl Trimethyl Ammonium Bromide) method.

**PCR amplification of molecular markers**

The PCR was programmed with condition of: initial denaturation at $94^0$C for 5 min; 35 cycles of 30 sec at $94^0$C, annealing at (55-60)$^0$C for 30 sec, 30 sec at $72^0$C; and plus a final extension step at $72^0$C for 5 min.

**Results and Discussion:**

This study analyzed the pattern of genetic divergence existing in 8 bitter gourd accessions using 15 SSR markers. Ten out of fifteen SSR primer pairs generated polymorphic band indicating a greater magnitude of diversity among the plant materials included in the present investigation. The highest PIC (Polymerase Chain Reaction) value was observed with primer S24, S26, and JY009 which can be used to differentiate further bitter gourd genotypes. Banding patterns generated by labelled primer pairs in various bitter gourd cultivars are shown in Fig 5. The detail demonstration of the diversity analysis of bitter

gourd genotypes using SSR markers are presented in Table 10. The results are based on diverse characteristics to evaluate the possibility of bitter gourd lines. The present results of genetic diversity among 8 accessions can be utilized to enhance other types of breeding analysis, such as association mapping, and trait-specific breeding for bitter gourd crop improvement programs, along with the development of hybrids for better exploitation of the natural genetic variations that exist within the available germplasm of cultivated bitter gourd.

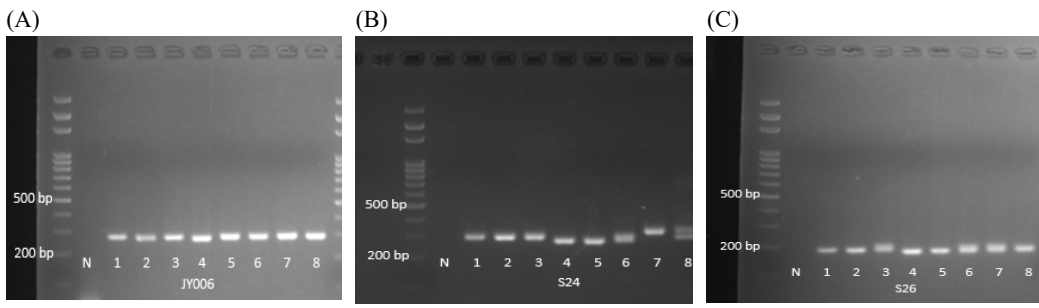


**Figure 5: Amplification profiles of various bitter gourd cultivars at the locus JY006, S24 and S26; L, Molecular wt. marker (100 bp ladder)**

The detail demonstration of the diversity analysis of bitter gourd genotypes using SSR markers are presented in Table 10. The results are based on diverse characteristics to evaluate the possibility of bitter gourd lines. The present results of genetic diversity among 8 accessions can be utilized to enhance other types of breeding analysis, such as association mapping, and trait-specific breeding for bitter gourd crop improvement programs, along with the development of hybrids for better exploitation of the natural genetic variations that exist within the available germplasm of cultivated bitter gourd.

**Table 10: Analysis of the DNA profiling among various bitter gourd varieties**

| Primer num. | Primer code | Molecular wt. range (bp) | Total no. of alleles | No. of polymorphic alleles | Alleles per locus | Polymorphism information content (PIC) |
|---|---|---|---|---|---|---|
| 1 | McSSR 20 | 150-250 | 9 | 3 | 3 | 0.36 |
| 4 | AVRDC BG-66 | 100-200 | 10 | 2 | 5 | 0.06 |
| 5 | JY 003 | 100-200 | 11 | 3 | 3.66 | 0.2 |
| 6 | JY004 | 100-200 | 8 | 2 | 4 | 0.2 |
| 7 | JY006 | 200-300 | 8 | 2 | 4 | 0.2 |
| 8 | JY009 | 200-300 | 8 | 2 | 4 | 0.5 |
| 10 | S12 | 100-200 | 10 | 3 | 3.33 | 0.4 |
| 13 | S24 | 250-400 | 9 | 3 | 3 | 0.5 |
| 14 | S26 | 150-250 | 8 | 2 | 4 | 0.5 |
| 15 | S32 | 100-200 | 11 | 3 | 3.66 | 0.2 |
| | | | Total alleles = 92 | Total polymorphic alleles = 25 | Average alleles per locus = 3.7 | Mean value of PIC = 0.3 |

## 3.2.2 SSR-based molecular characterization of various cauliflower cultivar

**Introduction:**

Molecular markers proved to be powerful tools for evaluating genetic variation and relationships in plant species. Among these are simple sequence repeats (SSRs), alternatively known as microsatellite markers, which have been successfully used for assessing the genetic variability and distinguishing among closely related Brassica genotypes, because of their co-dominance, high polymorphism and ability to reveal a high number of alleles for each locus, resulting in a high degree of variability and reproducibility. Many studies have assessed the genetic diversity and relationships of Brassica species worldwide. However, there are less reported molecular genetic studies to our knowledge on the *B. oleracea* species in Nepal. Therefore, our current study aimed to evaluate the genetic variation and relationships of a core collection of Nepalese *B. oleracea* genetic resources in order to improve their utilization, breeding and conservation strategies.

This study assesses the genetic diversity, population structure and relationships of *B. oleracea* germplasm in Nepal using microsatellite (SSRs) markers. The 12 SSR loci used in this study were significantly polymorphic and useful for differentiation among the accessions studied.

**Materials and methods:**

A total of 8 cauliflower genotypes namely Khumal Jyapu, Pusa Sarad, Agheni Cauliflower, Kathmandu Local, Pusa Meghana, Terai-2, Terai-1 and Jyapu-2 were used for microsatellite analysis. Sample leaves were collected from Horticulture Research Division, NARC, Khumaltar, Nepal. Total genomic DNA from the leaf samples was extracted following the modified version of Cetyl-Trimethyl-Ammonium bromide (CTAB) based protocol described by Murray and Thompson (1980).

**DNA profiling**

Amplification reactions were performed in a Thermal cycler and was programmed with condition of: initial denaturation at $94^0$C for 2 min; 35 cycles of 1 min at $94^0$C, annealing at 50-$60^0$C for 1 min, 1 min at $72^0$C; and plus a final extension step at $72^0$C for 20 min. In the thermal cycler, annealing temperature was set up appropriate for each primer pairs to ensure successful amplification. SSR-PCR products were analyzed on 2.5% agarose gel, visualized by staining with SYBR safe gel stain under short-wave UV light. The size of the PCR products was estimated using 100bp DNA ladder as a standard.

The polymorphism percentage was calculated with different primers based on the banding pattern obtained. The polymorphic information content (PIC), which estimates the allelic diversity, was calculated using the formula: $PIC=1-\Sigma(P_i)^2$, where, '$P_i$' is the frequency of the $i^{th}$ allele calculated for each microsatellite locus.

**Results and Discussion:**

In this study, a set of 20 SSR markers were analyzed to estimate genetic diversity among 8 genotypes, also the efficiency of markers were compared. All of the primers were successfully amplified. However, only 17 revealed clear and distinct polymorphisms out of 20 primers screened. The size range of the amplified DNAs ranged between 100bp and 700bp (Fig. 6). Our work indicates that SSR markers are simple to use, highly informative, reproducible, and are a good choice for molecular characterization of cauliflower genotypes. PIC values ranged from 0.27 to 0.66. The observed PIC value was lower than expected. The resulted data may be attributed to the variation in the Brassica species or the SSR loci used.

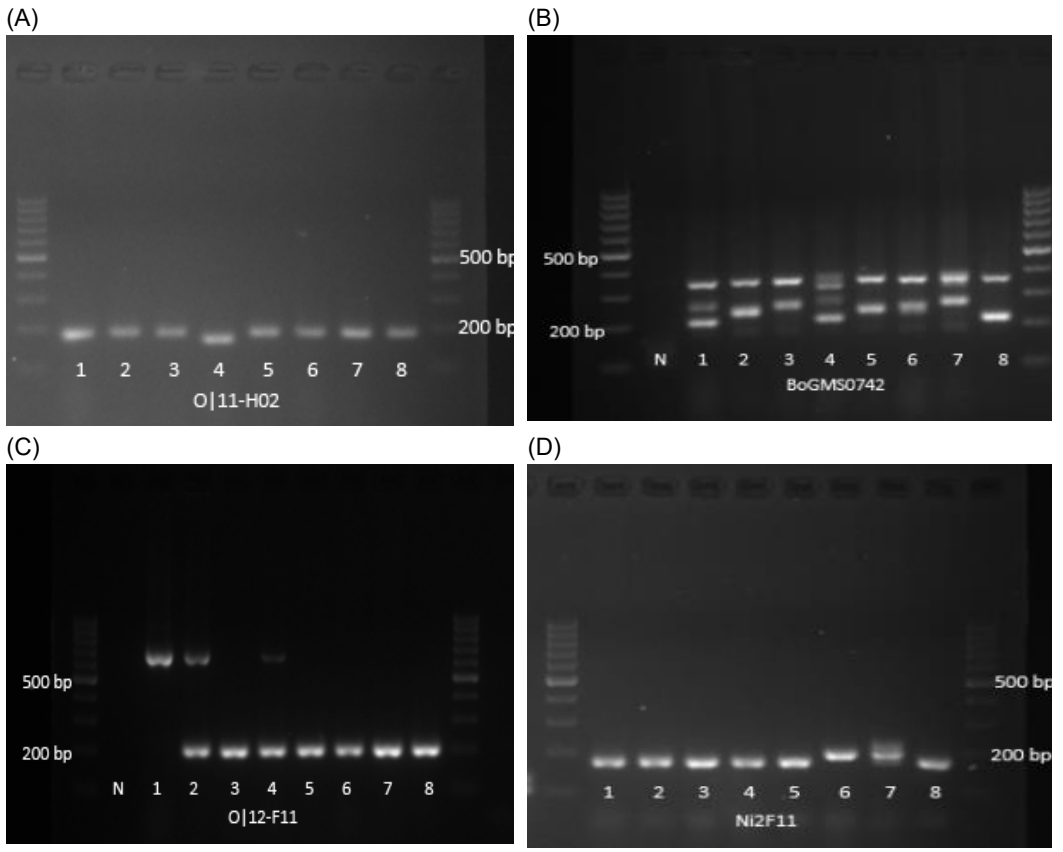


**Figure 6: Banding patterns created for the varieties of cauliflower using SSR-primers as labelled**

### 3.2.3 Genetic diversity of cucumber estimated by SSR markers

**Introduction:**

Cucumber (Cucumis sativus L. 2n = 2x = 14), is one of the most important and widely cultivated vegetables crops in Nepal and other parts of the world. Including cucumber in daily diets can lead to excellent health benefits as it is enriched with many essential nutrients such as vitamin A, vitamin B, vitamin C, vitamin K, manganese, folic acid, silicon, copper, and potassium. Its tender fruits are in great demand for salad and pickles round the year in almost every part of the world.

In spite of the fact that cucumber is one of the major cucurbitaceous crops developed in Nepal, its yield is considerably low due to the non-availability of high-yielding varieties that are well-suited for particular generation zones, diseases and pest infestation, and the lack of appropriate cultural practices such as fertilizers, irrigation, staking, drainage, and hoeing. Being a largely consumed vegetable, cucumber has great scope to improve the production productivity to meet the requirement by adoption of improved varieties/hybrids. Agronomic characters have limitations since they are influenced by environmental factors and the developmental stage of the plant. In contrast, molecular markers, based on DNA sequence polymorphisms, are independent of environmental conditions and show higher level of polymorphism. Among the molecular markers available, Simple Sequence Repeat (SSR) markers are one of the best choices for studying the genetic variability. SSR or microsatellite markers occur frequently in most eukaryotic genomes and can be very informative, reliable (reproducible), codominant, multiallelic and highly polymorphic, making them well suited for detecting variation among closely relative varieties.

**Materials and methods:**

In the current study, we focused on examining the genetic structure of the 8 cucumber genotype labelled as 004, 001 BL, Madhu (004X001), 006, 009, 003DL, 009X003 (Krishna), and 006X003 by using 15 SSR markers. Seed samples of 8 different accessions of cucumber were collected from Horticulture Research Division, NARC, Khumaltar, Nepal.

**Amplification of molecular markers**

The PCR plates were placed in a thermal cycler machine for amplification of target DNA fragments and was programmed with condition of: initial denaturation at $94^0$C for 4 min; 36 cycles of 1 min at $94^0$C, annealing at (55-60)$^0$C for 1 min, 1 min at $72^0$C; and plus a final extension step at $72^0$C for 10 min. In the thermal cycler, annealing temperature was set up appropriate for each primer pairs to ensure successful amplification.

**Results and discussion:**

In the present study, 15 SSR primers were used to estimate genetic diversity among 8 cucumber accessions, also the efficiency of markers were compared. All of the primer pairs showed successful amplification for 8 cucumber cultivars. Eight out of 15 SSR primer pairs

generated polymorphic band. A total of 68 alleles were detected among all genotypes. The number of alleles per locus varied from 2.6 to 5. The average number of alleles per locus was 3.8, indicating a greater magnitude of diversity among the plant materials included in the present investigation. PIC values for SSR ranged from 0.19 to 0.53 with the mean value of 0.4. The highest PIC value was observed with primer CSWCT13Balt which can be used to differentiate further cucumber genotypes. Banding patterns generated by labelled primer pairs in various cucumber cultivars are shown in Figure 7.

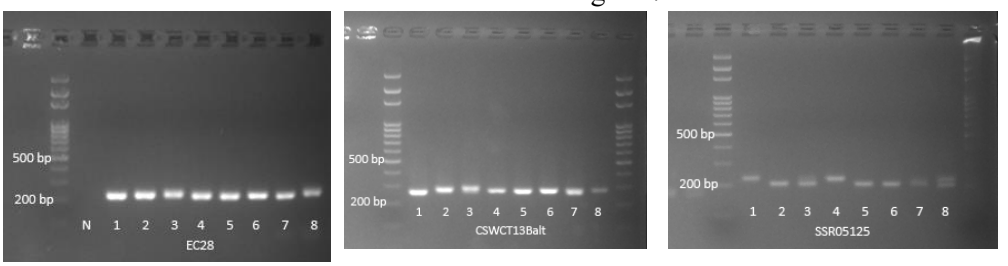


**Figure 7: Amplification profiles of various cucumber cultivars at the locus EC28, CSWCT13Balt and SSR05125. L, Molecular wt. marker (100 bp ladder)**

## 3. 2.4 Study of genetic diversity in oat accessions using SSR markers

**Introduction:**

To date, identification of oat cultivars has relied on morphological characteristics that may be influenced by environmental factors and require trained staff and large-scale growth experiments of mature plants under uniform conditions for evaluation. In addition, some cultivars are morphologically similar, making difficult to distinguish between them visually. SSR profiles can be used as a DNA fingerprint for registered cultivars to avoid redundancy of identical cultivars as well as to protect breeders' rights.

Here, we studied the genetic diversity of 19 cultivars for potential use in breeding programs. Furthermore, we tested the potential of SSRs for molecular identification of the oat cultivars studied.

**Materials and methods:**

Grains of 19 genotypes of oat were collected from National Pasture Fodder Research Programme, NARC, Khumaltar, Nepal (Table 11). The genomic DNA of the samples was extracted by Plant Genomic DNA isolation kit (Qiagen).

**Table 11: List of oat genotypes used in the study**

| Genotype code | Name of Variety | Genotype code | Name of Variety |
|---|---|---|---|
| 1 | Stamp Pad | 11 | Parbati |
| 2 | Qinghai-444 | 12 | Baiyan-1/Qimgyim-1 |
| 3 | Ganesh | 13 | NZA 3/14 |
| 4 | Longford | 14 | NZA 3/40 |
| 5 | Kona | 15 | NZA 3/17 |
| 6 | Swan Pak | 16 | NZA 3/18 |
| 7 | Amritdhara | 17 | NZA 3/11 |
| 8 | Nandani | 18 | Winter max |
| 9 | Netra | 19 | Crackjack |
| 10 | Kamadhenu | | |

PCR program included a cycle of primary denaturation at 94 °C for 30 sec, followed by 94 °C for 30 s, (50-60) °C for 45 s, and 72 °C for 90 s. The cycle was repeated 35 times followed by extension at 72 °C for 10 min, and then cooling at 4 °C.

**Results and discussion**:

Out of 20 SSR markers, 13 generated banding pattern. A total of 196 polymorphic bands were scored (Fig. 8). SSR primers namely AM 22 and Bmac306 generated higher levels of polymorphism. Mean value of PIC was observed to be 0.45. In general, all 13 amplified markers are highly informative for genetics and are extremely useful in distinguishing the polymorphism rate at a specific locus in oat accessions. This study helps to access the genetic diversity as well as genetic purity and hence their use for breeding.


**Figure 8: Amplification profiles of various oat cultivars at the locus HvWaxy4a, Bmag0603 and MAMA_4; L, Molecular wt. marker (100 bp ladder)**

## 3.3 Seed Quality Evaluation of Major Food Crops from Different Stakeholders of Nepal

**Introduction:**

Nepalese farmers are still raised a question to researchers and extension workers about the seed quality which they purchased from agrovets, seed cooperatives/companies and government agencies regarding seed germination and viability. The principal aim of the proposed project is to increase the production and productivity of major food crops (oilseed and grain-legumes) by evaluating source seed quality of public and private agencies. Research methodology includes identification of source seed suppliers from public and private service providers as well as smallholder/entrepreneur of major oilseed and grain-legume crops by making field visit in main market centers of different provinces of Nepal. Forty different source seed samples of each commodity will be collected from service providers and entrepreneur/smallholder farmers' of each provinces and its quality will be tested in NSSTRC laboratory according to crop season. Awareness program will be carried out to the farmers' groups/cooperatives by making interaction program during field visit. Quality seed help to increase production and productivity of the crop and which ultimately contribute in food security status of the farmers and country as well. Similarly, digitalisation of source seed production status helps to maintain seed balance sheet and make ease in seed distribution.

Attainable yields of all crops reported by the Ministry of Agriculture Development (MOAD) are much higher than the yield of food crops in farmers' field (MoAD. 2014). This is also an interface between scientist and farmers for enhancing their productivity and profitability. In general, source seeds are produced and supplied by different public and private service providers. Nepalese farmers are still raised a question to researchers and extension workers about the seed quality which they purchased from agro-vets, seed cooperatives/companies and government agencies regarding seed germination and viability (Poudel and Dhami, 2016). In F.Y. 2078/79 different source samples of rice, wheat, maize and lentil were collected from Bagmati, Gandaki and Lumbini Province. Preliminary result showed that, about 15%, 5% and 30% source seed samples were found below standard in terms of germination, purity and moisture content respectively. About 21.67% service sample having low germination and 30.23% samples having high moisture content observed during testing in NSSTRC laboratory (NSSTRC, 2021). Thus, knowing seed quality is important from farmers and researcher point of view for ensuring higher crop production and productivity. The principal aim of the proposed project is to help in reducing rural poverty and increase food security in rural areas of Nepal by increasing the production and productivity of major food crops by evaluating source seed quality of public and private agencies.

**THE MAIN GOAL OF THE PROJECT:**

- Contribute food security by increasing production of food crops through the evaluation of source seed quality of different stakeholders.

**SPECIFIC OBJECTIVES OF THE PROJECT:**

- To identify major source seed suppliers of major oilseeds and grain legumes from different stakeholders of Nepal
- To evaluate source seed quality of major oilseeds and grain legumes from public and private sectors
- To raise awareness to the farmers about source seed quality and its effects on crop yield
- To digitalize the source seed balance sheet in NSSTRC developed software

**RESEARCH METHODOLOGY:**

Research methodology such as identification of source seed suppliers from public and private service providers as well as smallholder/entrepreneur of major oilseeds and grain legumes by making field visit in main market centers of different provinces of Nepal. Altogether 280 different source seed sample of each crop was collected from service providers and entrepreneur/smallholder farmers' of each provinces and its quality was tested in NSSTRC laboratory according to crop season. Awareness program was carried out to the farmers' groups/cooperatives by making interaction program during field visit. Data which was gathered from the laboratory was tabulated and analyzed.

**TARGETED ACTIVITIES AND ACHIEVEMENTS**

**i. Sample collection of source seed of oilseed and grain-legumes crops (4):**

Altogether 284 samples of major oilseed and grain-legumes crops were collected from different NARC stations and stakeholders. These samples were collected from source center under NARC of different province. Mojority of grain legumes source seed samples were collected from National Grain Legume Research Program, Khajura, Banke. While for oilseed samples National Oilseed Research Program, Nawalpur, Sarlahi. Sample were collected by technician from NSSTRC by visiting the concern source seed centers. Whereas some samples were collected from market to check their quality and other seed testing parameters.

**ii. Source seed quality testing in NSSTRC laboratory (4):**

The existing source seed quality of entrepreneur/smallholder farmers were accessed by collecting 280 different samples of grain legumes and oilseed crops which they used according to crop season of each province. Similarly, samples were collected from public and private service providers like agrovets, seedcompany etc of different provinces Altogether, 284 different source seed samples were collected throughout the country.

Collected samples seed moisture, germination percentage, purity percentage, seed vigour and seed viability were tested in NSSTRC laboratory.The details of collected samples test results are presented in Annex 12.2.

**iii. Collection of feedback from NARC stations about the software developed by NSSTRC (4)**

NSSTRC developed the software to prepare balance sheet of source seed produced by NARC commodity programs and stations. The orientation program about the data recording and updating was organized by NSSTRC. Feedback of software was collected from different source center of NARC.

## 3.4 Participatory Technology Verification and Dissemination Project

### Introduction:

NARC is persistently developing the new reliable and practical technologies for the farmers to be benefitted from agriculture and ultimately uplift their livelihood. However, their access to those technologies is limited due to confound effect of difficult topography and lack of technology dissemination through extension personals. It is therefore farmers are still adopting the traditional practice and are farming for subsistence. On the other hand, the adoption of new technologies is lacking in certain situation due to the marginal farm resources and poor economy of farmers.

Quality seed is one of the important aspects in agriculture which along with other inputs can increase the agricultural production. But unfortunately, non formal seed system predominates which resulting low seed replacement rate (SRR). In Nepal, farmers' store their seed in traditional storage system and not maintained proper moisture in the seed and grain. This over moisture creates problem in seed quality. Thus, appropriate moisture content plays an important role to keep seed quality for longer duration. There is lack of awareness and knowledge on use of quality seeds and its relation in agricultural production. Similarly, farmers' have lack of knowledge about the systematic seed production technologies, handlings and proper storage techniques. On the other hand, different hybrid of maize and rice varieties has developed by NARC but their seed is not available in the market. Hybrid seed production technology is not verified at different places. Private seed companies/cooperatives are not in confidence to start maize hybrid seed production business. Community based seed production program are not fully aware about the seed production technologies in hybrids as well as OPVs. Hybrid seed production by private sector has just started by few companies. The cost of seed production is very high due to lack of mechanization in seed production program.

### 3.4.1 Demonstration of hybrid seed production technology (1)

Demonstration of Neplease hybrid maize (Rampur Hybrid 10) seed production technology in Bhakundebesi area of Kavrepalanchowk. Demonstration was carried out in one ropani area in farmars' manage condition. Bhakundebesi Seed Production Cooperatives was selected to facilitate demonstration. Thus male lines and female lines of Rampur Hybrid 10 seed were planted in farmers' field. One line of male seed were planted in field and after 72 hours, three lines of female seed were planted in the field. 35 kg of F1 seed (hybrid maize) were harvested from farmers' field. Adjacent farmers and members of cooperatives visited the demonstration block. All the farmers and stakeholders who visited demonstration block were benifited by this activity.

### 3.4.2 Large plot demonstration of Nepali hybrid maize (1)

About 70 kg of Rampur Hybrid 10 of maize were distributed to progressive farmers of Bhakundebesi and Kuntabesi of Kavrepalanchowk and Neupanetar of Sindhupalchowk district. This seed were planted in farmers' field in farmers' manage condition. The crop cut data were taken from the farmers' field. Average grain yield 8.1 t/ha were recorded from the field in case of Rampur Hybrid 10 of maize. Adjacent farmers grow CP series of maize hybrid. Technician from NSSTRC taken the crop cut data and average grain yield were found 8.5 t/ha. Thus, Rampur Hybrid 10 of maize was found almost similar in terms of yield.

### 3.4.3 Large plot demonstration of Nepali hybrid rice (2)

Similarly, about 30 kg Neplease hybrid rice (30 kg Hardinath Hybrid 1) was distributed to progressive farmers of Kuntabesi of Kavrepalanchowk and Neupanetar of Sindhupalchowk district. Nursery bed is established to transplant seedlings after harvesting spring maize. The overall results of these demonstrations block showed that, Hardinath hybrid 1 produced 8.01 t/ha grain yield while local check variety Makwanpur 1 recorded 4.98 t/ha. Farmers' response was quite encouraging regarding Hardinath Hybrid 1 of rice.

### 3.4.4 Demonstration of Hermetic storage technologies (4)

Farmers still follow traditional method to store seed and grain in the field level. Post harvest handling of seed and grain is also one of the challenges for the farmers. Thus, use of PICS bag and super grain bags to store source seed in farmers' level in NARC technology village and outreach sites of NARC stations. Around 100 super grain bags were distributed in outreach sites of HCRP, Kabre, Dolakha at Jugu, Dolakha of Bagmati province of Nepal. This PICS bag and super grain bag were demonstrated among the farmers' group at Jugu, Dolakha. Hermetic storage technologies were demonstrated in community seed bank at Jugu, Dolakha and feedback of the farmers' were also collected after some time. About

90% of farmers' said that, super grain bags helped to protect seed from insect pest attack in storage. This technology need to be replicate in other areas too.

### 3.4.5 Interaction program on quaity seed production and marketing with seed producing farmers', farmers' group, seed companies, NARC, SQCCs and other stakeholders involved in seed production and marketing (3)

#### 3.4.5.1 Background

Research has shown that the high-quality seed, alone, contributes a 15–20 percent increase in production. Timely availability of high-quality seed at reasonable price is key to attaining food security through increased crop production. However, the seed supply system of Nepal is not reliable, and farmers have always complained about unavailability of quality seeds (Kaini, 2021). The national seed vision (NSV 2013) recognizes inadequate varietal choice, lack of access to high quality seed, low seed replacement rates (SRR) and dominance of informal seed sector as the key constraints faced by Nepali farmers (MOALD, 2013). The research and development institutions are lagging in conserving diverse genetic resources, developing appropriate varieties according to the farmers' need and preferences, producing sufficient amounts of different classes of seed and coordinating among stakeholders for a smooth supply of seeds to the farmers (Kaini, 2021). Consequently, farmers are forced to depend on informal seed supply system resulting in low seed replacement rates. Further, the formal seed market is increasingly dominated by imported seeds.

Recent policy shift facilitating the involvement of the private sectors in improved seed production business has shown some positive indications in terms access to seed and SRR. Vdassani (2017) reports that about 20 private seed companies are involved in producing and marketing seed, contributing around 27 percent of the country's seed production. The public sector's (e.g., National Seed Company) share is relatively high for wheat seed (e.g., National Seed Company), while the community sector's share is higher for rice and maize. Similarly, the private sector's shares are moderate for wheat, rice, and maize, but are very high for vegetable crops. Despite these positive indications, the existing SRR for cereal crops is below 20% and achieving 25% SRR by 2025 as envisioned by the NSV 2013 (MOALD, 2013) needs special attentions for strengthening the seed supply chain.

The seed production cycle involves different classes of seeds, namely Nucleus seed, Breeder's seed, Foundation seed, Certified seed (C1 and C2) and Improved seed (Paudel et al., 2013). Various research stations under Nepal Agricultural Research Council (NARC) are responsible for producing Breeder's seed and Foundation seed, while public companies, private companies, seed producer cooperatives and groups are responsible for producing remaining classes of seeds. It is worth noting that the NSV 2013 has envisioned to reduce NARC's focus on Foundation seed production gradually leaving this responsibility to seed

companies (MOALD, 2013). The NSV 2013 projected the requirement of 88mt and 2978 mt breeder and foundation seeds, respectively (Table 12). NARC reported 60 mt and 976 mt of breeder and foundation seeds, respectively in 2021 (NARC, 2021). Considering the production of breeder seed, the achievement is not far behind the NSV 2013 target. However, the achievement regarding foundation and Certified or Improved seed is much lower than the targets. Therefore, strengthening source seed – improved seed production network is utmost to ensure that the seed cycle is maintained properly, and production targets set by NSV 2013 are met.

**Table 12: Production of BS, FS and CS/IS against projected total requirement**

| Seed class | Projected requirement | | | Production status (mt) | | | |
|---|---|---|---|---|---|---|---|
| | 2015 | 2020 | 2025 | 2001 | 2005 | 2009 | 2010 |
| Breeder | 55 | 71 | 88 | 52 | 50 | 52 | 53 |
| Foundation | 1977 | 2552 | 2978 | 699 | 670 | 1471 | 1502 |
| Certified/improved | 53944 | 76371 | 92527 | 3583 | 10503 | 32352 | 37320 |

**Source: MOALD (2013)**

The transition to federal governance system coupled with negative aftermaths of COVID 19 pandemic has further aggravated the disruption in the earlier seed supply network throughout the country. Therefore, reestablishing and strengthening the source seed – improved seed production and distribution networks is crucial to ensuring seed self-sufficiency in the country. In this backdrop, the National Seed Science and Technology Research Centre (NSSTRC) conducted a one-day interaction program on "Quality Seed Production and Marketing" in Dhangadhi, Kailali with the overall aim of strengthening the seed production and distribution system in Sudur-Paschim province and beyond. The specific objectives of the interaction program were as follows:

- To assess the challenges and opportunities in seed value chain in the Sudur-Paschim province
- To facilitate the re-establishment of source seed to improved seed production networks in the region
- To develop a functional communication network among public-private stakeholders along the seed value chain

### 3.4.5.2 Methodology

The interaction program involved presentation followed by discussion (See Annex 1). The chief of NSSTRC, Mr. Narayan Bahadur Dhami, welcomed the guests and highlighted the objectives of the interaction program. Six presentations were made by the representatives of various organizations. Each presentation was followed by extensive interaction among the participants. The presentation session was followed by the group work. The participants were divided into two groups: Group A did the exercise on challenges and opportunities in

seed production, while the Group B discussed on challenges and opportunities in seed marketing in the region. Then, the representatives of both groups presented their outcomes. Finally, The Chief of NSSTRC thanked the participants and concluded the program.

### 3.4.5.3 Major Achievements

The presenters covered the various aspects of seed production and marketing in the Sudur-Paschim province. First, Dr. Bibek Sapkota presented about recently released/ registered crop varieties and present status of breeder and foundation seed production. He also demonstrated that if the seed cycle is maintained properly, the seed demand will be easily met. Second Mr. Tikendra Kusmi presented the seed production program in the Sudur-Paschim region on the behalf of the provincial Ministry of Land Management, Agriculture and Cooperatives (MOLMAC). Third, Mr. Dilli Raj Chaudhary presented the seed quality control status in the region on behalf of provincial Seed Laboratory. Fourth, Mr. Lok Raj Joshi presented the status of seed production and distribution by Unique Seed Company, Kailali and challenges and opportunities for seed production in Sudur-Paschim region. Fifth, Mr. Lokesh Bhatta of the Himalayan Seed Company, Kailali presented the seed production and distribution status and challenges and opportunities for seed production in the region. Sixth, Mr. Govinda Raj Rawat, the Manager of Bij Briddhi Krishak Sahakari of Janaki Rural Municipality, Kailalil presented seed production and marketing status and challenges in seed production for farmers. Each presentation was followed by group discussion.

**Challenges in seed production and marketing in the Sudur-Paschim province**

- Subsistence farming system
- Unavailability of source seed (breeder seed), fertilizers, irrigation, and other inputs in time
- Long distance to source seed centers
- Poor access to research and extension supports and services
- Lack of opportunities for training and exposure facilities
- Lack of sufficient monitoring from government agencies due to insufficient human resources
- Poor access to credits, high interest rates, banks are reluctant to provide loans for crop lands
- Free grazing system of livestock farming in some areas
- Land fragmentation leading to difficulty in maintaining isolation distance for cross pollinated crops
- No awareness and low access to crop insurance
- Insufficient laboratory facilities for testing soil and seed
- Decreasing supply of labors

- Unavailability of appropriate machines and mechanization service
- Unavailability of reliable electricity supply
- No access to climatic and disease forecasting services
- Lack of infrastructures, such as post harvesting processing, grading, labelling and storage facilities
- Seed adulteration is hampering company/cooperative reputation
- Poor internal coordination and no price uniformity among seed suppliers
- Farmers' low awareness – low demand for modern variety seeds
- Competition with imported cheaper seeds, informal supply of cheaper seeds through open border with India
- Subsidy on old variety seeds
- Uncertain demand leading to dumping of treated seeds
- Poor buying mechanism with farmers

**Opportunities in seed production and marketing in the Sudur-Paschim province**

- Low rainfall, especially during harvesting season, in the Sudur-Paschim region
- Relatively dry environment
- Fertile land with high organic matter
- Potential for developing irrigation facilities
- Diverse ecology supporting crop diversification
- Increasing networks with research, extension and education institutions
- Low SRR indicating opportunity for increasing
- Increasing micro-financial institutions
- Increasing access to crop insurance
- Land consolidation and cooperative farming
- Increasing rural road networks

### 3.4.5.4 Conclusion and Recommendations

The interaction program conclude that the Sudur-Paschim region has a great potential for fostering seed industry mainly due to climatic feasibility, growing interest of seed entrepreneurs and increasing research-extension-companies-farmers networks. However, Seed production and marketing network has disrupted after the conversion political system into federal system which should be reestablished and strengthened. Seed industry in Sudur-Paschim region can contribute to self-sufficiency in the region and beyond if the following recommendations are taken into account.

- NARC has registered/released more than 723 modern crop varieties. However, many of them are not up to the preferences of farmers. NARC should focus on developing need-based crop varieties.

- Some classes of seed, such as Certified-1 and Certified-2, are no longer in use, indicating disruption of seed cycle. Focus should be given for strict implementation of the seed cycle, or the cycle should be remodeled based on practicality. Research should answer why the seed cycle has not been maintained and what could be the alternative seed cycle.
- Seed companies often do not get the sufficient amount of breeder seeds even if their demand has been included in the seed balance sheet. NARC should focus on increasing breeder seed production leaving the foundation seed production to seed companies. Exploring the technologies to store seed for more than one year could solve some part of the problem.
- There is no research station representing the terai region of Sudur-Paschim province. NARC should consider establishing one.
- Productivity of vegetables, legumes and oilseed seed production has drastically decreased making seed business less profitable.
- Farmers are not aware of new crop varieties appropriate for their ecologies. Therefore, they always look for older varieties such as Sarju-52 and Radha-4 which leads to low demand for new variety seeds. Extension program should focus on educating farmers about new varieties and technologies.
- Companies should implement pre-production purchase agreement with farmers so that the farmers feel less uncertainty about the market of their seed.
- Production cost of seed is high making the seed business less profitable. Research should focus on mechanizing seed production and reducing production cost.
- Farmers consider that using combine harvester to harvest seed increase likelihood of seed mixing. Small machines should be available for small farmers.
- Unavailability of fertilizers in time and irrigation facilities are other challenges for seed producers in the region.
- NARC should increase its outreach program because participatory technology validation increases farmers' awareness about the technology and demand for improved seeds.
- Although supplying quality source seed is important, seed producers should be educated in other technical aspects of production, such as spacing, fertilizer application, and other management issues.
- Subsidy program in seed is not scientific. Giving 75% in some seeds and not giving any subsidy in other seeds distorts the market. Moreover, subsidy should be focused only on modern variety seeds.
- Farmers should be trained even for producing truthful labelled seeds.

# 4. TECHNOLOGY TRANSFER AND SERVICES

## 4.1 Services

NSSTRC has been working in close association with national commodity programmes, private seed companies, agricultural cooperatives, seed production projects /programs and provides the seed testing and information services to respective seed stakeholders. Followings were the seed quality attributes tested in Central seed laboratory following ISTA 2011 rules and guidelines as well as norms developed by NSB. Seed analysis reports were provided to respective seed producers, seed companies, researchers and farming groups. A total of 452 seed samples were analyzed and reported, out of this, 168 samples were service samples and 284 samples were research sample (Annex 12.1 and 12.2). Similarly, 19 samples of oat, 8 samples of cauliflower, 8 samples of bitter gourd and 8 samples of cucumber were analysed in molecular laboratory. Altogether 495 samples were analysed in NSSTRC laboratory in F. Y. 2079/80. Seed testing services focused on:

- Analytical Purity Analysis, moisture content test and germination test (Routine Seed Test)
- Tetrazolium Salt Test, Vigor Test, Ageing Test, Cold Test, Field plot and biochemical and molecular marker test (special testing)
- Proficiency seed sample testing

## 1.2 Publications

On hundred copy book on the topic of "*Hybrid Rice and maize Seed Production Technology"* was published in Nepali language. Likewise two hundred copy booklets on *"Varietal Characteristic of Released Hybrid Rice and Hybrid Maize"* were published with the financial support from National Agricultural Technology Information Center, Khumaltar, Lalitpur. Similarly, 75 copy *Annual Report* was published and distributed to present the results of projects conducted by NSSTRC during the FY 2079/80 (Annex 8).

## 4.3 Training and visits

A total of 249 person visited NSSTRC in F.Y. 2079/80 (Annex 9 and 10). Enterpreneur farmers, Scientists, Professors, Technicians, Students etc. were visited NSSTRC to make interaction with staff about technical information and facilities of NSSTRC with regard to the seed quality testing and molecular services. Students, agriculture extension staffs of DoA, also visited the NSSTRC laboratory. Similarly, one national graduates were working as interns in NSSTRC, Khumaltar, Lalitpur in F.Y. 2079/80 and successfully completed their internship (Annex 10). Similarly, on the spot training was also provided to the farmers' groups and seed producers of cooperatives in OR sites and NARC Technology Village through out the country during field visit.

## 5. BUDGETAND EXPENDITURE

In F.Y. 2079/80, NSSTRC operational and capital budget was NRs 1,74,43,000 (operational- NRs.1,60,43,000 and capital budget- NRs.14,00,000). In FY 2079/80, 10% budget was cut off by Government of Nepal. But in staff salary, there is deficit of budget for the staff so additional budget were requested for this heading. Out of total budget, only NRs. 1,63,58,400.41 was expended as operational and capital budget (Annex 13). The financial progress was observed 93.78% of total budget of NSSTRC. During the year, total revenue of NRs. 83,707 was collected through seed testing services and sales of research crop production and others (Annex 14). Total beruju was NRs. 84,225 during 2079/80 which was sent for clearing process (Annex 15).

## 6. KEY PROBLEMS

Human resource is the main problem followed by limited laboratory space is still the key problem in the centre. Lack of scientific manpower to run the molecular lab and seed lab is the main constraint in this centre. The centre has been successful in facilitating and strengthening the services and research resources with support of collaborative seed projects. Due to the limitation of space inside the building all activities could not have been brought into full operations. For the limitation of the space, NSSTRC would suggest to allocate two story whole building and premises for NSSTRC as 'Seed Bhawan'.

## 7. WAY FORWARD

A good amount of research in the field of NSSTRC has been carried out and significant contributions made on seed regulatory frameworks formulation and implementation in past and recent year by the centre. The field is wide as it includes a cadre of disciplines of seed biology to its marketing, management and uses. But in the present context following research areas on quality seeds for improving the production per unit area are felt to prioritize and carry out the studies:

- Basic studies on seed biology, morphology, and physiology of different agricultural crop species.
- Resiliency of seeds to climate change
- On-farm seed management and improvement of farmers saved seeds which dominates the national seed system
- Use of biotechnology and molecular techniques in support of seed technology and genetic studies of local crop diversity
- Collaborative research with different seed stakeholders
- Harmonizing the seed quality and their use
- Seed production research in hybrid maize and rice

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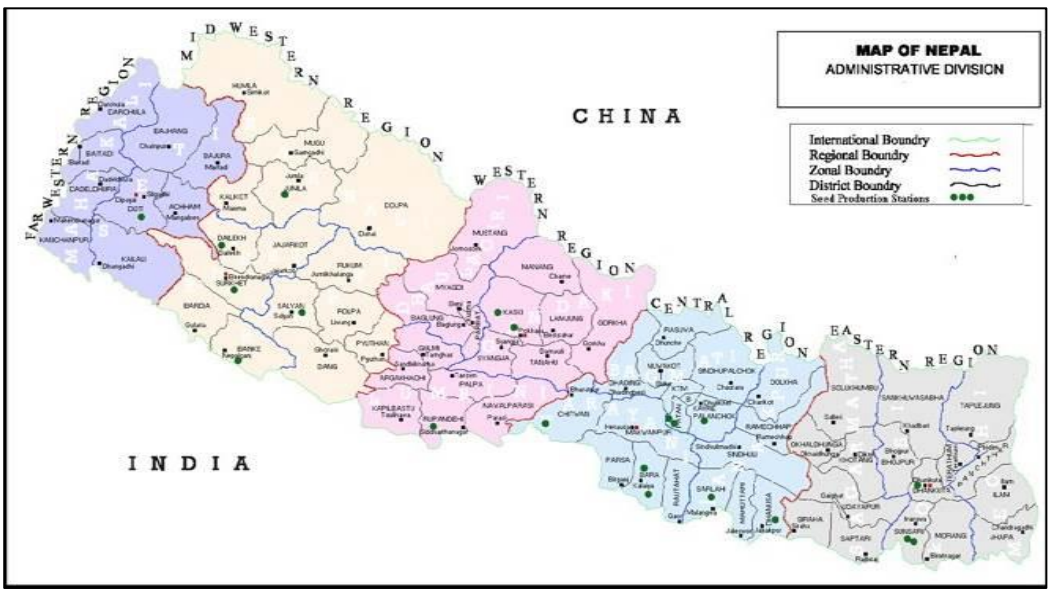
# 9. ANNEXES

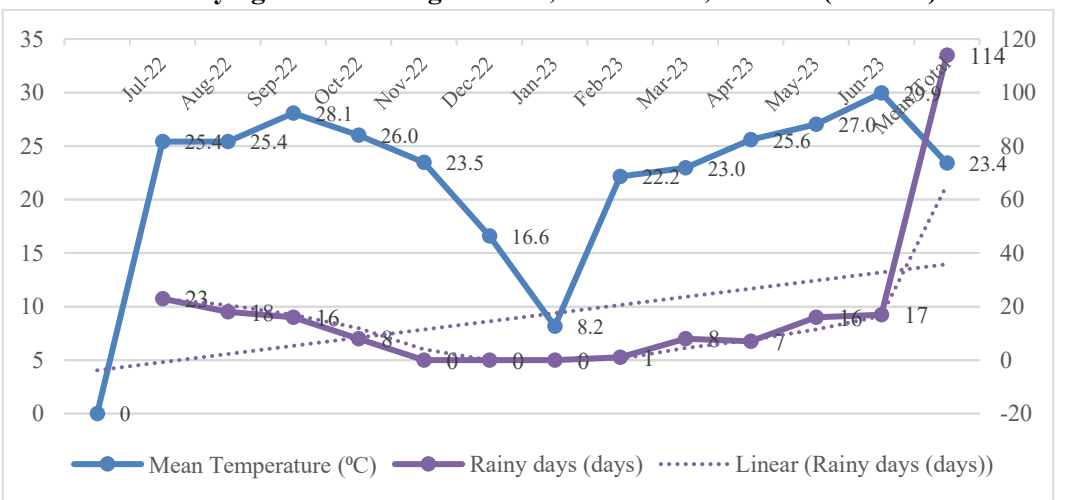
## Annex 1. Map of the seed production stations, NARC




## Metrological information

During this fiscal year, Khumaltar received 1108.1 mm annual rainfall in 114 rainy days with annual average of maximum and minimum temperature 23.4 ºC and 12.8ºC respectively. Details are given in table below.

**Annex 2. Monthly agro-meteorological data, Khumaltar, 2079/80 (2022/23)**

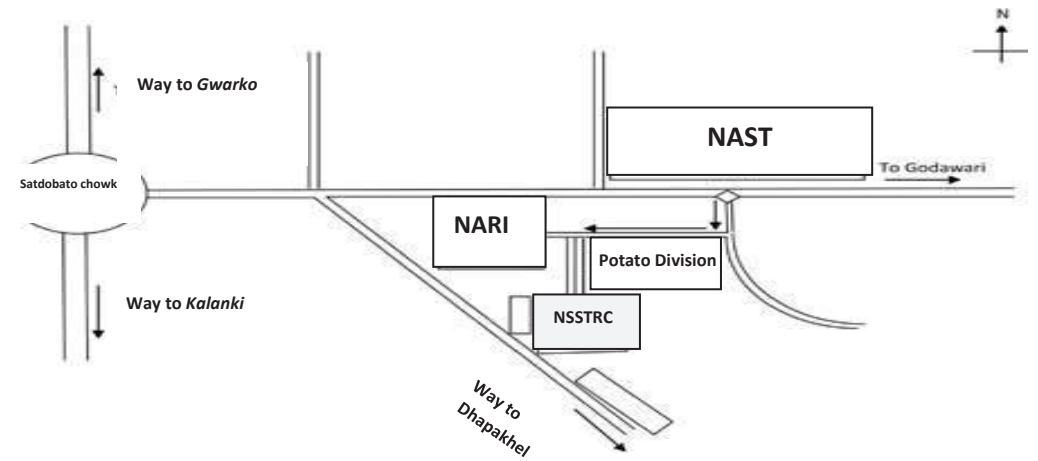



**Maximum, minimum temperature and total monthly rainfall, Khumaltar, 2079/80 (2022/23)**

**Monthly agro-meteorological data of Khumaltar, Lalitpur, 2079/80 (2022/23)**

| Month/Year | Mean Temperature (ºC) | | Total rainfall (mm) | Rainy days (days) |
|---|---|---|---|---|
| | Maximum | Minimum | | |
| Jul-22 | 25.4 | 20.0 | 263.6 | 23 |
| Aug-22 | 25.4 | 19.0 | 192.9 | 18 |
| Sep-22 | 28.1 | 19.8 | 121.1 | 16 |
| Oct-22 | 26.0 | 14.2 | 107.7 | 8 |
| Nov-22 | 23.5 | 8.3 | 0.0 | 0 |
| Dec-22 | 16.6 | 4.4 | 0.0 | 0 |
| Jan-23 | 8.2 | 6.3 | 0.0 | 0 |
| Feb-23 | 22.2 | 6.6 | 9.4 | 1 |
| Mar-23 | 23.0 | 9.6 | 58.9 | 8 |
| Apr-23 | 25.6 | 11.6 | 40.8 | 7 |
| May-23 | 27.0 | 14.3 | 109.8 | 16 |
| Jun-23 | 29.9 | 19.7 | 203.9 | 17 |
| **Mean/Total** | **23.4** | **12.8** | **1108.1** | **114** |

## Annex 3. Map of the office/station




## Annex 4.1. List of equipments/machines in seed testing laboratory facilities, 2079/80 (2022/23)

| S.N. | Major instruments | Testing facilities |
|---|---|---|
| 1 | Ag seed magnifier *(W/light seed, Buro Ag-MC110/c)* | Magnifying seed |
| 2 | Air conditioner *(Chunlan)* | Maintaining temperature inside working room |
| 3 | Altimeter *(Multi-function digital altimeter, Model no. ZD-2028/ 6 in 1)* | Recording altitude of location during seed sampling |
| 4 | Balance *(Electric balance, Triple beam balance, Pan balance, Torsion balance, Digital counting balance/ Weighing scale, Electronic kitchen scale, Denver instrument-counting balance, 4-digit balance-Kern ABJ, 3-digit balance, Electronic balance of 100 kg capacity)* | Working sample preparation and seed weighing |
| 5 | Camera canon DSLR | Capturing photos of lab and field activities |
| 6 | Canon 3010 *(3 in 1 printer)* | Printing reports and protocols |
| 7 | Check point of $O_2$/$Co_2$ recharge adapter | Measuring $O_2$ and $CO_2$ of sample |
| 8 | Chlorophyll meter *(TYS-A and spad 502)* | Recording chlorophyll content of leaf |
| 9 | Computerized seed counter | Seed counting |
| 10 | Corn Thresher *(electric)* | Threshing corn |
| 11 | Dan sensor $O_2$ and $CO_2$ gas analyzer | Gas analysis |
| 12 | Desiccators *(Big size, medium size and small size)* | Sample storage for short period |
| 13 | Desktop Computer sets *(Goldkist, Lenovo, Acer)* | Data recording and technical works |
| 14 | Dickey John *(Grain Analyser Computerised Moisture Meter)* | Recording Moisture content of sample |
| 15 | Digital Calliper | Seed measurement unit (mm) |
| 16 | Digital Camera *(Canon, Sony, Cyber-shot 14.1 mega pixels, Carl Zeiss, Vario-Tessar)* | Capturing laboratory activities |
| 17 | Digital temperature and RH indicator | Recording Temperature and RH |
| 18 | Digital thermo hygrometer | Temperature and RH reading |
| 19 | Digital vernier caliper DL.S1 Lutron | Quantitative trait reading |
| 20 | Divider *(Boerner Seed Divider, Soil Seed Divider, Gamet Seed Divider)* | Working sample preparation |
| 21 | E.Q.F Disintegrator high speed mill *(24000 RPM)* | Seed milling |
| 22 | Eye piece-digital camera (*Coslab- MDCE-5C)* | Microscopic photography |
| 23 | Fax machine | Faxing documents |
| 24 | Fiber Measuring tape *(Field tape)* | Recording measurements of field |
| 25 | Filing cabinet *(steel and glass door cabinets)* | Record filing |
| 26 | Gas Air Quality Meter *(6 in 1)* | Gas analysis meter |

| S.N. | Major instruments | Testing facilities |
|---|---|---|
| 27 | Glass plate | Purity analysis |
| 28 | GPS- *GARMIN (e-Trex GPS)* | Measurement of altitudes |
| 29 | Grain density meter *(Phoenix instrument)* | Weighing sample |
| 30 | Hand scoop SS large | Withdrawing samples |
| 31 | Hanna EC meter *(meters for EC/ TDS/OC/OF)* | Conductivity test |
| 32 | High Speed Grinder | Grinding sample |
| 33 | Hygrometer *(Tem./Clock/Humidity)* | RH /T measurement |
| 34 | Laboratory aspirator | Purity analysis |
| 35 | Laptops *(Acer, Lenovo, Dell, slim laptop - dell)* | Data recording and report writing |
| 36 | Microscope *(Leitz-HM-LUX-3, Wild M3Z- Heerbrugs Switzerland, Olympus SZ51, Leitz-Laborluz K)* | Seed identification and seed micro-organism infection |
| 37 | Mini Tiller | Ploughing the research field |
| 38 | Mobile set *(Huawei and Redmi)* | Communicating devices |
| 39 | Oven *(Memmert, Baking Oven )* | Moisture testing and drying beads |
| 40 | Paddy Thresher Machine *(Manual)* | Threshing rice |
| 41 | pH meter *(Portable)* | Recording pH of sample |
| 42 | Photocopy machine *(Canon-iR 1024)* | Photocopy and scanner |
| 43 | Plant growth chamber | Germination test |
| 44 | Portable leaf area meter | Recording leaf area |
| 45 | Portable Sieve Set | Sieving |
| 46 | Projector *(Optima)* | Presentation of files |
| 47 | Refrigerator *(lg)* | Storing chemicals and reagents |
| 48 | Sample Trier set | Sampling unit |
| 49 | Samsung Tab A 8.0 | Recording data |
| 50 | Sealing Machine *(Vacuum sealer & Impulse sealer)* | Relative to post- harvest study |
| 51 | Seed ageing chamber *(India)* | Vigor test |
| 52 | Seed Aging Chamber | Vigor test |
| 53 | Seed analyzer with scanner | Seed analysis |
| 54 | Seed blower Dacota type | Blowing samples |
| 55 | Seed coating machine | Sample coating |
| 56 | Seed Enlarger seed Buro | Magnifying objects |
| 57 | Seed Germinator *(Labline, Indosaw, Accumax)* | Germination of sample |
| 58 | Seed Grinder *(Rico and Victor)* | Seed moisture content |
| 59 | Seed grinder Lab mill *(3310 perten S/N 160611)* | Seed grinding |
| 60 | Seed Moisture Meter Wile 78 Crusher-7 | Moisture test |
| 61 | Seed Purity Board | Seed purity |
| 62 | Seed sampler *(30 inches X 5 holes)* | Seed sampling |
| 63 | Seed sampling tier *(20 mm brass, light and heavy)* | Seed sampling |
| 64 | Seed scoop | Seed lifting |
| 65 | Sieve set (*75mm / 20 sieves set)* | Sampling unit |
| 66 | Single ear thresher | Threshing |

| S.N. | Major instruments | Testing facilities |
|---|---|---|
| 67 | Single panicle/headthresher-1 | Threshing |
| 68 | Soil Auger *(Screw type-98 mm)* | Soil sampler |
| 69 | Soil moisture meter | Soil moisture test |
| 70 | Stabilizer and Voltage Regulator | Power supply to machinery |
| 71 | Steel cupboard *(plain and locker type)* | Storing record files and registers |
| 72 | The pHep Family Hanna Instrument | Seed conductivity test |
| 73 | Thermometer *(Manual)* | Calibration of germinators |
| 74 | UPS *(Sukam, Emerson)* | Backup for computer |
| 75 | Vacuum seed counter | Seed counting |
| 76 | Water pump *(Crompton Greaves)* | Water supply |
| 77 | Wile-66 | Portable grain moisture test |
| 78 | Xerox Canon MF 3010 set *(3 in one)* | Printing and scanning |
| 79 | ZH 3500 Generator | Power supply |

## Annex 4.2 Lists of equipments/machines in molecular laboratory facilities, 2079/80 (2022/23)

| S.N. | Major Instruments | Testing facilities |
|---|---|---|
| 1 | Air Conditioner *(Panasonic)* | Cooling lab |
| 2 | Animax Real Time PCR *(PC system, Power backup solar Hybrid - 3 pieces)* | DNA Finger printing and backup system |
| 3 | Autoclave *(Accumax, India)* | Sterilization unit |
| 4 | Centrifuge *(REMI, CAT No. R-24, Serial no.-VCDP-5338)* | Homogenizing unit |
| 5 | Deep fridge *(Whirlpool and Yasuda)* | Preserving the DNAs |
| 6 | Desktop Computer set *(HP Pavilion and Acer)* | Data entry and analysis |
| 7 | Electrophoresis *(power supply - Serial no.93086, EV 243, Made in Belgium and Multi sub midi set 10 X 10 cm*) | Supply of power and gel electrophoresis unit |
| 8 | Gel documentation *(Alpha Innotech)* | Documenting the banding of DNAs on gel |
| 9 | Ice box | Cooling DNA samples |
| 10 | Ice flack machine-*SIMAG* | For making Ice Flakes |
| 11 | Incubator Machine *(Water bath)-18X18X18)* | Incubation |
| 12 | Laminar flow | Health test |
| 13 | Liquid Nitrogen Refrri | Storing liquid nitrogen |
| 14 | Magnetic stirrer *(SONAR, CAT No. MS-1, Serial no. F0034910311)* | Shaking and mixing unit |
| 15 | Medifuge *(Heraeus Sepatech RPM X 1000)* | Homogenizing unit |
| 16 | Micro Oven *(lg)* | Preparing gel |
| 17 | Micro-centrifuge *(PPW Med. Instrument)* | Homogenizing unit |
| 18 | pH meter *(Chemi line, Digital PH meter with ATC CL-120*) | Determining PH |

| S.N. | Major Instruments | Testing facilities |
|---|---|---|
| 19 | Polymerase Chain Reaction *(PCR - Corbet, Model no. CGL-96, Serial no. C-10081)* | DNA sequence amplification unit |
| 20 | Refrigerated micro centrifuge *(Model T 50)* | Homogenizing unit |
| 21 | Spectrophotometer *(JENWAY, single cell holder)* | Quantification of DNAs |
| 22 | Vaccine carrier *(1.6 liter w/4 Ice packs Aov)* | Cooling |
| 23 | Vitascope *(Burrows equipment co., USA)* | X-rays of seed and Florets |
| 24 | Vortex mixer *(Touch type and Tallboys USA-digital)* | Shaking the solns |
| 25 | Water bath *(SONAR)* | Warming the PCR Recipes |
| 26 | Water Distillation Unit | Making distilled water |

## Annex 5. Human resource, 2079/80 (2022/23)

| S. No. | Name | Position | Qualification | Specialization/ Working area |
|---|---|---|---|---|
| 1 | Dr. Pallavi Kumari Singh | Senior Scientist, $S_4$ | PhD | Plant breeding and genetics |
| 2 | Arjun Prakash Poudel | Scientist, $S_2$ | M Sc. Ag. | Agronomy |
| 3 | Dr. Sarita Manandhar | Scientist, $S_2$ | PhD | Agronomy |
| 4 | Bisesh Rijal | Technician, $T_5$ | B Sc. Ag. | Agronomy |
| 5 | Indira Devi Uprety | Administrative Officer, $A_6$ | B.A. | Sociology |
| 6 | Supretee Manandhar Karmacharya | Account Officer $A_6$ | B.B.S. | Account |
| 7 | Goma Bajgain | Technical Assistant (5th Level) | Literate | Lab. Assistant |
| 8 | Bishnu Maharjan | Technical Assistant | Literate | Lab. Assistant |
| 9 | Lahani Tharuni | Technical Assistant | Literate | Lab. Assistant |
| 10 | Madan Man Dangol | Light Vehicle Driver | Literate | Driver |
| 11 | Ms. Neelam Shrestha | Lab Assistant | B. Sc. (Biotech) | Molecular lab. |
| 12 | Mr. Sanish Maharjan | Lab Assistant | B.B.S. | Seed lab. and Computer |

## Annex 6. Summary progresses of research projects, 2079/80 (2022/23)

| S. No. | Project/Activities | Budget in NRs. '000' | Progress | Remarks |
|---|---|---|---|---|
| **1** | **Qualitative and Quantitative Characterization of Pre-release Varieties of Agricultural crops** | **687** | | |
| 1.1 | Agro-morphological characteristics study of promising genotypes of rice (3) | 168 | Descriptors of seven promising rice genotypes (NR-11271-B-B-6, NR-11105-B-B-27, NR-11115-B-B-31-3, NR-11301-B-B-1, NR-11321-B-B-7-3, NR-10676-B-5-3, US-312 and Khumal-4) prepared. | |
| 1.2 | Agro-morphological characteristics study of promising genotypes of wheat (4) | 178 | Descriptors of ten promising wheat genotypes viz; WK-3223, WK-3321, WK-3523, WK-3550, WK-3092, WK-3118, WK-3320, WK-3015, K-3020, WK-3534, WK-1204 and Chyakhura prepared. | |
| 1.3 | Agro-morphological characteristics study of promising genotypes of soyabean (2) | 172 | Descriptors of eight mid hills promising genotypes of soyabean (Chaingmow 6063, CN-60, GC-82234-22C, G-4508, CM-9133, LS-77-16-16, Coll#3 and Black soybean) prepared. | |
| 1.4 | Agro-morphological characteristics study of promising genotypes of tartary buckwheat (3) | 169 | Descriptors of of eight promising genotypes of buckwheat (ACC # 6506, Khumal-7, B.W-F.F.T.T.B, ACC # 2201-2, Kabre bitter, ACC # 2227-1, ACC # 2223-1 and ACC # 2194) prepared. | |
| **2** | **Seed Variety Identification and Diversity Analysis using DNA Fingerpringting Technology** | **1290** | | |
| 2.1 | Fingerprinting different promising genotypes of cauliflower (2) | 410 | Successful PCR Optimization (DNA fingerprinting) of Cauliflower using 11 SSR markers | |
| 2.2 | Fingerprinting different promising genotypes of cucumber and bitter gourd (3) | 460 | Succefully analyzed the pattern of genetic divergence existing in 8 bitter gourd accessions using 15 SSR markers and 15 SSR primers were used to estimate genetic diversity among 8 cucumber accessions, also the efficiency of markers were compared | |
| 2.3 | Fingerprinting promising oat genotypes (4) | 420 | Successful PCR optimization for oats using 12 SSR markers Completed | |

| S. No. | Project/Activities | Budget in NRs. '000' | Progress | Remarks |
|---|---|---|---|---|
| **3** | **Participatory Technology Verification and Dissemination Project** | **1128** | | |
| 3.1 | Demonstration of hybrid seed production technology (1) | 301 | Demonstration of hybrid seed production technology of Rampur Hybrid 10 (RH 10) of maize crop is harvested sun dried and stored | |
| 3.2 | Large plot demonstration of Nepali hybrid maize (1) | 252 | Large plot demonstration of Nepali hybrid maize (Rampur Hybrid 10) is harvested and crop cut data were taken and presented in review workshop | |
| 3.3 | Large plot demonstration of Nepali hybrid rice (2) | 188 | Large plot demonstration of Nepali hybrid rice (Hardinath Hybrid 1) is harvested and crop cut data taken | |
| 3.4 | Demonstration of Hermetic storage technologies (4) | 187 | Hermetic storage technologies were demonstrated in community seed bank at Jugu, Dolakha | |
| 3.5 | Interaction program on quaity seed production and marketing with seed producing farmers', farmers' group, seed companies, NARC, SQCCs and other stakeholders involved in seed production and marketing (3) | 200 | Interaction program on quaity seed production and marketing with seed producing farmers', farmers' group, seed companies, NARC, SQCCs and other stakeholders involved in seed production and marketing organized at Sudurpaschhim Province | |
| **4** | **Farm management project (FMP)** | **2910** | | |
| 4.1 | Office support maintenance and beautification (4) | 1790 | Office support and beautification related activities is completed | |
| 4.2 | Office level proposal seminar (2) | 20 | Office level proposal seminar is completed | |
| 4.3 | Participate in annual planning and review workshop organized at province level (4) | 200 | Participated in planning workshop and Quarterly Progress Review Meeting at Khumaltar of FY 2079/80 Completed | |
| 4.4 | Office and farm security (4) | 350 | Office, farm and laboratory security related activities was completed and guard samples stored in store house. | |
| 4.5 | Monitoring and evaluation (4) | 450 | Monitoring source seed production blocks at different farms and stations completed | |
| 4.6 | Annual Report Publication (1) | 100* | Annual report Published and distributed | *Publishe d from Administr |

| S. No. | Project/Activities | Budget in NRs. '000' | Progress | Remarks |
|---|---|---|---|---|
| | | | | ative budget |
| **5** | **Seed Quality Evaluation of Major Food Crops from Different Stakeholders of Nepal** | **1400** | | |
| 5.1 | Sample collection of source seed of oilseed and grain-legumes crops (4) | 625 | 284 samples of major oilseed and grain-legumes crops were collected from different NARC stations and stakeholders | |
| 5.2 | Source seed quality testing in NSSTRC laboratory (4) | 700 | All the collected 284 samples were tested in seed testing in laboratory and analysed | |
| 5.3 | Collection of feedback from NARC stations about the software developed by NSSTRC (4) | 75 | Feedback were taken from different source center regarding production program of NARC | |

**Annex 7.** आ.ब. २०७९/८० **(2022/23)** मा संचालित **तालिम/गोष्ठी/इन्टर्नसिप/ओ.जे.टी.**

| क्र.स. | तालिम /गोष्ठी | अवधि | लक्षित समूह | स्थान | सहभागी संख्या |
|---|---|---|---|---|---|
| १ | गुणस्तरीय बीऊ उत्पादन तथा बजारिकरण सम्बन्धि अन्तरक्रिया कार्यक्रम | १ दिन | कृषक/बीउ उत्पादक कृषक समूह/बीउ कम्पनी/ सहकारी | धनगढी, सुदुरपश्चिम प्रदेश | ३२ |
| २ | आ. ब. २०८०/८१ को परियोजनाहरुको कर्यलायास्तरमा प्रस्तुतिकरण तथा छलफल कार्यक्रम | १ दिन | केन्द्र प्रमुख, परियोजना लिडर, लेखा अधिकृत, प्रशासकिय अधिकृत, योजना महाशाखा, अनुगमन तथा मुल्यांकन महाशाखा प्रतिनिधि आदी | राष्ट्रिय बीउ बिज्ञान प्रबिधि अनुसन्धान केन्द्र, खुमलटार, ललितपुर | ७ |
| ३ | ओ. जे. टी. | ३ महिना | कृषि डिप्लोमा तहमा र आई. एस्सी. कृषि (प्लान्ट साइन्स) अध्यनरत बिधार्थीहरु | राष्ट्रिय बीउ बिज्ञान प्रबिधि अनुसन्धान केन्द्र, खुमलटार, ललितपुर | ७ जना बिधार्थीहरु |
| ४ | इन्टर्नसिप | ३ महिना | बि. एस्सी (कृषि संकाय) अध्यनरत बिधार्थी | राष्ट्रिय बीउ बिज्ञान प्रबिधि अनुसन्धान केन्द्र, खुमलटार, ललितपुर | १ जना बिधार्थी |

## Annex 8. Publications in F.Y. 2079/80 (2022/23)

| S. No. | Name of publications | Type * | Language | Authors | No. of copies |
|---|---|---|---|---|---|
| 1 | Annual Report (2079/80) | Book | English | AP Poudel and NB Dhami | 75 |
| 2 | नेपालमा बर्णसंकर (हाईब्रिड) धान र मकैको बीउ उत्पादन प्रबिधि | Book | Nepali | NB Dhami and Dr. SR Subedi | 100 |
| 3 | नेपालमा सिफारिस गरिएका धान र मकै बालीका बर्णसंकर जातहरु र पैत्रिक लाईनहरुको परिचय र बिशेषताहरु | Booket | Nepali | NB Dhami and Dr. SR Subedi | 200 (With financial support of NATIC, Khumaltar) |

**Books, leaflet, brochure, manuals, pamphlets, audio visual etc*

## Annex 9. Visit of the office by farmers, extension officials /technicians, entrepreneurs, cooperatives, farmer groups, NGO/CBO officials, Institutions etc. in F.Y. 2079/80 (2022/23)

| S. No. | Leader's name | Students/ Farmers' number | Name of Institution/ Farm/ Universities | Purpose of visit |
|---|---|---|---|---|
| 1 | Shiva Kumar Mandal | 12 | Pramila Krishi Farm | Lab visit for practical knowledge |
| 2 | Principal | 34 | Mahendra Ratna Campus | Lab visit. |
| 3 | Suman KC | 2 | KEC | Lab structure observation |
| 4 | Shiva Kumar Mandal | 10 | Pramila Krishi Farm | Lab visit for practical knowledge |
| 5 | Laxman Yadav | 8 | Principal, College | Lab visit, Practical session |
| 6 | Principal | 25 | Gokuleshwor Agriculture & Animal Science College | Lab visit |
| 7 | Shreeman Nepali | 150 | Goldengate International College | Lab visit |
| **Total** | | **241** | | |

**Annex 10. Work experience programme (WEP), internship and volunteers etc., in F.Y. 2079/80 (2022/23)**

| S. No. | Name of students | Qualification | Name of College/ University | Internship Duration |
|---|---|---|---|---|
| 1 | Manjay Yadav | I.Sc. Ag. (Plant Science) | Janpriya Technical School | 3 months |
| 2 | Bibek Yadav | I.Sc. Ag. (Plant Science) | Janpriya Technical School | 3 months |
| 3 | Arjun Singh Danuwar | I.Sc. Ag. (Plant Science) | Shiladevi Madhyamik School | 3 months |
| 4 | Puja Pudasaini | B.Sc. Ag | AFU, Rampur, Chitwan | 3 months |
| 5 | Sunita Kumai | I.Sc. Ag. (Plant Science) | Shree Janata Madhyamik School | 6 months |
| 6 | Rupa Pulami Magar | I.Sc. Ag. (Plant Science) | Shree Janajyoti Secondary School | 6 months |
| 7 | Ashok Dallakoti | Diploma in Agriculture (Plant Science) | Dhading Polytechnic School | 3 months |
| 8 | Bibek Nepal | Diploma in Agriculture (Plant Science) | Dhading Polytechnic School | 3 months |

**Annex 11. Details of staff meetings/SRMT meeting and coordination meetings etc., in F. Y. 2079/80 (2022/23)**

| S. No. | Type of meetings | Target | Achievement | Remarks |
|---|---|---|---|---|
| 1 | Monthly Staff Meeting | 12 | 12 | |
| 2 | SRMT (Station Research and Management Team) Meeting | 6 | 6 | |
| 3 | Procurement Committee Meeting | 4 | 4 | |
| 4 | Coordination Meeting (Provincial Agricultural Ministries, Rural Municipalities, Municipalities, Ward level meetings, Meeting with I/NGOs etc. | 4 | 4 | |
| 5 | Others | 4 | 4 | |
| **Total** | | **30** | **30** | |

# Annex 12.1 Service provided (routine sample), FY 2079/80 (2022/23)

| S.N. | Lab No. | Name and Address of Sender | Crop | Variety | Type | Sample Received | PURITY TEST (%) | | | | GERMINATION TEST (%) | | | | | MOISTURE TEST | 1000 SEED WEIGHT (gm) | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | Pure Seed | Other Crop seed | Weed Seed | Innert matter | Germn | Abnor. | Fresh | Hard | Dead | | | |
| 1 | 001 | राष्ट्रिय बाली बिज्ञान अनुसन्धान केन्द्र, खुमल्टार | Wheat | Dhaulagiri | FS | 4/16/2079 | 98.5 | 0.0 | 0.0 | 1.5 | 87 | 4 | 0 | 0 | 9 | 8.9 | 0 | |
| 2 | 002 | | Wheat | WK 1204 | FS | | 99.8 | 0.0 | 0.0 | 0.2 | 85 | 6 | 0 | 0 | 9 | 9.1 | 0 | |
| 3 | 003 | | Wheat | Swargadwari | FS | | 99.6 | Trace | Trace | 0.4 | 86 | 4 | 0 | 0 | 10 | 9.6 | 0 | |
| 4 | 004 | | Wheat | Munal | FS | | 99.7 | 0.0 | 0.1 | 0.2 | 87 | 3 | 0 | 0 | 10 | 9.7 | 0 | |
| 5 | 005 | | Wheat | Khumal Shakti | FS | | 99.8 | 0.0 | 0.0 | 0.2 | 90 | 3 | 0 | 0 | 7 | 9.7 | 0 | |
| 6 | 006 | | Wheat | Bheriganga | FS | | 99.8 | 0.0 | 0.0 | 0.2 | 90 | 4 | 0 | 0 | 6 | 10.7 | 0 | |
| 7 | 007 | सिद्दि कृषि सहकारी संस्था लिमिटेड, भक्तपुर | Wheat | Swargadwari | IS | 4/20/2079 | 98.3 | 0.5 | 0 | 1.2 | 70 | 15 | 0 | 0 | 15 | 10.9 | 0 | |
| 8 | 008 | | Wheat | WK 1204 | IS | | 99.5 | 0.0 | 0.0 | 0.5 | 86 | 8 | 0 | 0 | 6 | 10.7 | 0 | |
| 9 | 009 | | Wheat | WK 1204 | IS | | 100.0 | 0.0 | Trace | 0.0 | 90 | 2 | 0 | 0 | 8 | 12 | 0 | |
| 10 | 010 | | Wheat | Swargadwari | IS | | 99.2 | 0.0 | 0 | 0.8 | 89 | 7 | 0 | 0 | 4 | 12.1 | 0 | |
| 11 | 011 | | Wheat | WK 1204 | IS | | 99.5 | 0 | 0 | 0.5 | 87 | 6 | 0 | 0 | 7 | 12.9 | 0 | |
| 12 | 012 | | Wheat | WK 1204 | IS | | 99.8 | 0 | 0 | 0.2 | 79 | 9 | 0 | 0 | 12 | 11.4 | 0 | |
| 13 | 013 | | Wheat | Swargadwari | IS | | 99.5 | 0.0 | 0 | 0.5 | 80 | 10 | 0 | 0 | 10 | 11 | 0 | |
| 14 | 014 | | Wheat | Swargadwari | IS | | 99.2 | 0 | 0 | 0.8 | 50 | 10 | 0 | 0 | 40 | 12.5 | 0 | |
| 15 | 015 | | Wheat | Munal | IS | | 98.9 | Trace | 0.0 | 1.1 | 61 | 12 | 0 | 0 | 27 | 11.5 | 0 | |
| 16 | 016 | राष्ट्रिय बाली बिज्ञान अनुसन्धान केन्द्र, खुमल्टार | Lentil | Maheshwari Bharati | FS | 4/26/2079 | 99.7 | 0.0 | 0 | 0.3 | 89 | 1 | 4 | 0 | 6 | 10.9 | 0 | |
| 17 | 017 | | Rice | Khumal 11 | FS | | 93.4 | 0.0 | 0 | 6.6 | 22 | 13 | 53 | 0 | 12 | 12.3 | 0 | |
| 18 | 018 | राष्ट्रिय बाली प्रजनन् तथा आनुवंसिक अनुसन्धान केन्द्र, खुमलटार | Wheat | WK 1204 | NS | 4/30/2079 | 100.0 | 0.0 | 0.0 | Trace | 91 | 4 | 0 | 0 | 5 | 11.9 | 0 | |
| 19 | 019 | | Wheat | WK 1204 | NS | | 99.9 | Trace | 0 | 0.1 | 83 | 8 | 0 | 0 | 9 | 11.8 | 0 | |
| 20 | 020 | | Wheat | Chyakhura | NS | | 99.8 | 0 | 0 | 0.2 | 87 | 7 | 0 | 0 | 6 | 12.1 | 0 | |
| 21 | 021 | | Wheat | Chyakhura | NS | | 99.6 | Trace | 0 | 0.4 | 85 | 11 | 0 | 0 | 4 | 11.6 | 0 | |
| 22 | 022 | | Wheat | Munal | NS | | 99.5 | 0 | 0 | 0.5 | 92 | 3 | 0 | 0 | 5 | 12.2 | 0 | |
| 23 | 023 | | Wheat | Munal | NS | | 99.3 | Trace | 0 | 0.7 | 92 | 6 | 0 | 0 | 2 | 12.3 | 0 | |
| 24 | 024 | | Wheat | Mudule 1 | NS | | 99.9 | 0 | 0 | 0.1 | 93 | 4 | 0 | 0 | 3 | 12.2 | 0 | |
| 25 | 025 | | Wheat | Mudule 1 | NS | | 99.9 | 0 | 0 | 0.1 | 92 | 5 | 0 | 0 | 3 | 12.1 | 0 | |
| 26 | 026 | | Wheat | Surma | NS | | 99.9 | 0 | 0 | 0.1 | 89 | 5 | 0 | 0 | 6 | 12.1 | 0 | |
| 27 | 027 | | Wheat | Surma | NS | | 99.9 | 0 | 0 | 0.2 | 80 | 11 | 0 | 0 | 9 | 12 | 0 | |
| 28 | 028 | | Wheat | Tila | NS | | 99.5 | 0.1 | 0 | 0.5 | 87 | 6 | 0 | 0 | 7 | 12.5 | 0 | |
| 29 | 029 | | Wheat | Tila | NS | | 99.5 | 0 | 0 | 0.5 | 86 | 8 | 0 | 0 | 6 | 10.6 | 0 | |
| 30 | 030 | | Wheat | Tila | NS | | 99.4 | 0 | 0 | 0.6 | 83 | 11 | 0 | 0 | 6 | 9.6 | 0 | |
| 31 | 031 | | Wheat | Kautila | NS | | 99.8 | 0 | 0 | 0.2 | 90 | 5 | 0 | 0 | 5 | 10.1 | 0 | |
| 32 | 032 | | Wheat | Kautila | NS | | 99.5 | 0 | 0 | 0.5 | 79 | 30 | 0 | 0 | 8 | 9.5 | 0 | |
| 33 | 033 | | Wheat | Kautila | NS | | 99.5 | 0 | 0 | 0.56 | 76 | 11 | 0 | 0 | 13 | 9.6 | 0 | |

| S.N. | Lab No. | Name and Address of Sender | Crop | Variety | Type | Sample Received | PURITY TEST (%) | | | | GERMINATION TEST (%) | | | | | MOISTURE TEST | 1000 SEED WEIGHT (gm) | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | Pure Seed | Other Crop seed | Weed Seed | Innert matter | Germn | Abnor. | Fresh | Hard | Dead | | | |
| 34 | 034 | | Wheat | Bheriganga | NS | | 99.9 | 0 | 0 | 0.1 | 83 | 4 | 0 | 0 | 13 | 9.5 | 0 | |
| 35 | 035 | | Wheat | Bheriganga | NS | | 99.4 | 0 | 0 | 0.6 | 74 | 6 | 0 | 0 | 20 | 9.3 | 0 | |
| 36 | 036 | | Wheat | Bheriganga | NS | | 99.9 | 0 | 0 | 0.1 | 74 | 9 | 0 | 0 | 17 | 9.6 | 0 | |
| 37 | 037 | | Wheat | Himganga | NS | | 99.4 | 0 | 0 | 0.6 | 83 | 4 | 0 | 0 | 13 | 9.9 | 0 | |
| 38 | 038 | | Wheat | Himganga | NS | | 98.5 | 0 | 0 | 1.5 | 81 | 11 | 0 | 0 | 8 | 9.7 | 0 | |
| 39 | 039 | | Wheat | Himganga | NS | | 98.2 | 0 | 0 | 1.8 | 81 | 11 | 0 | 0 | 8 | 10.1 | 0 | |
| 40 | 040 | | Wheat | Khumal Shakti | NS | | 99.6 | 0 | 0 | 0.4 | 74 | 6 | 0 | 0 | 20 | 11 | 0 | |
| 41 | 041 | | Wheat | Khumal Shakti | NS | | 99.8 | 0 | 0 | 0.2 | 68 | 11 | 0 | 0 | 21 | 10.7 | 0 | |
| 42 | 042 | | Wheat | Khumal Shakti | NS | | 99.8 | 0 | 0 | 0.2 | 75 | 6 | 0 | 0 | 19 | 10.7 | 0 | |
| 43 | 043 | | Wheat | WK 2430 | NS | | 99.4 | 0 | 0 | 0.6 | 79 | 5 | 0 | 0 | 16 | 10.5 | 0 | |
| 44 | 044 | | Wheat | WK 2430 | NS | | 99.2 | 0 | 0 | 0.8 | 89 | 7 | 0 | 0 | 4 | 11 | 0 | |
| 45 | 045 | | Wheat | WK 2432 | NS | | 99.9 | 0 | 0 | 0.1 | 84 | 4 | 0 | 0 | 12 | 10.4 | 0 | |
| 46 | 046 | | Wheat | WK 2432 | NS | | 99.5 | Trace | 0 | 0.5 | 89 | 6 | 0 | 0 | 5 | 10.8 | 0 | |
| 47 | 047 | | Wheat | WK 2787 | NS | | 100 | 0 | 0 | Trace | 78 | 6 | 0 | 0 | 16 | 11.1 | 0 | |
| 48 | 048 | | Wheat | WK 2820 | NS | | 99.8 | 0 | 0 | 0.2 | 71 | 7 | 0 | 0 | 22 | 11.4 | 0 | |
| 49 | 049 | | Wheat | WK 2843 | NS | | 99.8 | 0 | 0 | 0.2 | 79 | 9 | 0 | 0 | 12 | 11 | 0 | |
| 50 | 050 | | Wheat | WK 2743 | NS | | 99.6 | 0 | 0 | 0.4 | 68 | 11 | 0 | 0 | 21 | 11 | 0 | |
| 51 | 051 | | Wheat | WK 2891 | NS | | 99.6 | 0 | 0 | 0.4 | 80 | 8 | 0 | 0 | 12 | 10.9 | 0 | |
| 52 | 052 | | Wheat | WK 3005 | NS | | 99.8 | 0 | 0 | 0.2 | 95 | 5 | 0 | 0 | 0 | 10.8 | 0 | |
| 53 | 053 | | Wheat | WK 3163 | NS | | 99.5 | 0 | 0 | 0.5 | 81 | 3 | 0 | 0 | 16 | 11.6 | 0 | |
| 54 | 054 | | Wheat | WK 3164 | NS | | 99.8 | 0 | 0 | 0.2 | 48 | 8 | 0 | 0 | 44 | 11.2 | 0 | |
| 55 | 055 | | Wheat | WK 3164 | NS | | 99.5 | 0 | 0 | 0.5 | 61 | 10 | 0 | 0 | 29 | 11.5 | 0 | |
| 56 | 056 | | Wheat | WK 3164 | NS | | 99.5 | 0 | 0 | 0.5 | 84 | 16 | 0 | 0 | 0 | 11.2 | 0 | |
| 57 | 057 | | Wheat | WK 3164 | NS | | 99.3 | 0 | 0 | 0.7 | 79 | 6 | 0 | 0 | 15 | 11 | 0 | |
| 58 | 058 | | Wheat | WK 3165 | NS | | 99.6 | 0 | 0 | 0.4 | 70 | 21 | 0 | 0 | 9 | 11.1 | 0 | |
| 59 | 059 | | Wheat | WK 3165 | NS | | 98.8 | 0 | 0 | 1.2 | 59 | 11 | 0 | 0 | 30 | 11.3 | 0 | |
| 60 | 060 | | Wheat | WK 3165 | NS | | 99.9 | 0 | 0 | 0.1 | 76 | 5 | 0 | 0 | 19 | 10.6 | 0 | |
| 61 | 061 | | Wheat | WK 3165 | NS | | 99.2 | 0 | 0 | 0.8 | 77 | 8 | 0 | 0 | 15 | 11.7 | 0 | |
| 62 | 062 | | Wheat | WK 3166 | NS | | 99.5 | 0 | 0 | 0.5 | 72 | 5 | 0 | 0 | 23 | 11.1 | 0 | |
| 63 | 063 | | Wheat | WK 3167 | NS | | 100 | 0 | 0 | Trace | 73 | 9 | 0 | 0 | 18 | 11.2 | 0 | |
| 64 | 064 | राष्ट्रिय चरण तथा घाँसे बाली अनुसन्धान कार्यक्रम, खुमलटार | Grass | Common Vetch | FS | 5/13/2079 | 99.3 | 0.4 | 0.1 | 0.3 | 96 | 0 | 1 | 0 | 3 | 11.6 | 0 | |
| 65 | 065 | | Rye | Dhunche | FS | | 91.1 | 0.1 | 0.2 | 8.6 | 29 | 0 | 48 | 0 | 23 | 12.5 | 0 | |
| 66 | 066 | | Oat | Nandani | FS | | 97.8 | 0.8 | Trace | 1.3 | 97 | 0 | 1 | 0 | 2 | 11 | 0 | |
| 67 | 067 | | Oat | Ganesh | FS | | 98.5 | 0.3 | Trace | 1.3 | 98 | 0 | 1 | 0 | 1 | 9.6 | 0 | |
| 68 | 068 | | Oat | Parbati | FS | | 98.4 | 0.7 | Trace | 0.9 | 98 | 0 | 0 | 0 | 2 | 10.9 | 0 | |
| 69 | 069 | | Oat | Amritdhara | FS | | 99.2 | 0.6 | Trace | 0.2 | 96 | 0 | 2 | 0 | 2 | 12.2 | 0 | |
| 70 | 070 | | Oat | Kamdhenu | FS | | 99 | 0.6 | Trace | 0.4 | 93 | 1 | 4 | 0 | 2 | 10.2 | 0 | |
| 71 | 071 | | Oat | Netra | FS | | 98.2 | 1.2 | 0 | 0.6 | 99 | 1 | 0 | 0 | 0 | 10.2 | 0 | |

| S.N. | Lab No. | Name and Address of Sender | Crop | Variety | Type | Sample Received | PURITY TEST (%) | | | | GERMINATION TEST (%) | | | | | MOISTURE TEST | 1000 SEED WEIGHT (gm) | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | Pure Seed | Other Crop seed | Weed Seed | Innert matter | Germn | Abnor. | Fresh | Hard | Dead | | | |
| 72 | 072 | केन्द्रीय कृषि प्रयोगशाला, हरिहरभवन | Wheat | Swargadwari | PS | 5/13/2079 | 0 | 0 | 0 | 0 | 71 | 9 | 0 | 0 | 20 | 0 | 0 | |
| 73 | 073 | | Wheat | WK 1204 | PS | | 0 | 0 | 0 | 0 | 76 | 7 | 0 | 0 | 17 | 0 | 0 | |
| 74 | 074 | | Wheat | Khumal Shakti | PS | | 0 | 0 | 0 | 0 | 80 | 4 | 0 | 0 | 16 | 0 | 0 | |
| 75 | 075 | श्री नाललुंगा कृषि तथा बीउ उत्पादन सहकारी संस्था लिमिटेड, दोलखा | Wheat | WK 1204 | IS | 5/26/2079 | 0 | 0 | 0 | 0 | 96 | 3 | 0 | 0 | 1 | 0 | 0 | |
| 76 | 076 | | Wheat | Dhaulagiri | IS | | 0 | 0 | 0 | 0 | 89 | 3 | 4 | 0 | 4 | 0 | 0 | |
| 77 | 077 | | Wheat | Swargadwari | IS | | 0 | 0 | 0 | 0 | 71 | 7 | 7 | 0 | 15 | 0 | 0 | |
| 78 | 078 | बागबानी अनुसन्धान केन्द्र, राजिकोट, जुम्ला | Mustard | Khumal Chaudapaat | FS | 5/26/2079 | 99.8 | 0 | 0 | 0.2 | 54 | 0 | 30 | 0 | 16 | 7 | 0 | |
| 79 | 079 | | Radish | Tokinasi | FS | | 99.6 | Trace | 0 | 0.4 | 90 | 2 | 5 | 0 | 3 | 6.4 | 0 | |
| 80 | 080 | | Carrot | New Kruda | FS | | 94.2 | 0 | 0 | 5.8 | 66 | 1 | 6 | 0 | 27 | 9.8 | 0 | |
| 81 | 081 | | Swiss Chard | Susag | FS | | 99.1 | 0 | 0 | 0.9 | 82 | 2 | 16 | 0 | 0 | 10.2 | 0 | |
| 82 | 082 | | Onion | Red Credol | FS | | 99.8 | 0 | 0 | 0.2 | 83 | 1 | 12 | 0 | 4 | 7.6 | 0 | |
| 83 | 083 | | Pea | Arkel | FS | | 99.7 | 0 | 0 | 0.3 | 91 | 4 | 1 | 2 | 2 | 11.7 | 0 | |
| 84 | 084 | राष्ट्रिय कृषि इंजिनियरिंग अनुसन्धान केन्द्र, खुमलटार | Orange | Trifoliate seed | RS | 6/2/2079 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| 85 | 085 | | Orange | Trifoliate seed | RS | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| 86 | 086 | | Orange | Trifoliate seed | RS | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| 87 | 087 | | Orange | Trifoliate seed | RS | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| 88 | 088 | | Orange | Trifoliate seed | RS | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| 89 | 089 | | Orange | Trifoliate seed | RS | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| 90 | 090 | | Orange | Trifoliate seed | RS | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| 91 | 091 | | Orange | Trifoliate seed | RS | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| 92 | 092 | | Orange | Trifoliate seed | RS | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| 93 | 093 | | Orange | Trifoliate seed | RS | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| 94 | 094 | | Orange | Trifoliate seed | RS | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| 95 | 095 | | Orange | Trifoliate seed | RS | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |

| S.N. | Lab No. | Name and Address of Sender | Crop | Variety | Type | Sample Received | PURITY TEST (%) | | | | GERMINATION TEST (%) | | | | | MOISTURE TEST | 1000 SEED WEIGHT (gm) | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | Pure Seed | Other Crop seed | Weed Seed | Innert matter | Germn | Abnor. | Fresh | Hard | Dead | | | |
| 96 | 096 | जगत बहादुर श्रेष्ठ (कृषक), दोलखा | Potato | Chakre | RS | 7/18/2079 | 0 | 0 | 0 | 0 | 62 | 3 | 31 | 0 | 4 | 0 | 0 | |
| 97 | 097 | | Potato | TPS 7/67 | RS | | 0 | 0 | 0 | 0 | 8 | 2 | 0 | 0 | 90 | 0 | 0 | |
| 98 | 098 | | Potato | TPS 7/67 | RS | | 0 | 0 | 0 | 0 | 63 | 2 | 19 | 0 | 16 | 0 | 0 | |
| 99 | 099 | | Potato | Rojita | RS | | 0 | 0 | 0 | 0 | 66 | 2 | 26 | 0 | 6 | 0 | 0 | |
| 100 | 100 | | Potato | Lyanthe-Jagat 1 | RS | | 0 | 0 | 0 | 0 | 83 | 2 | 10 | 0 | 5 | 0 | 0 | |
| 101 | 101 | राष्ट्रिय बाली प्रजनन् तथा आनुवंसिक अनुसन्धान केन्द्र, खुमलटार | Maize | Manakamana 4 | BS | 8/9/2079 | 0 | 0 | 0 | 0 | 98 | 1 | 0 | 0 | 1 | 0 | 0 | |
| 102 | 102 | | Maize | Manakamana 4 | FS | | 0 | 0 | 0 | 0 | 95 | 2 | 2 | 0 | 1 | 0 | 0 | |
| 103 | 103 | प्रमिला कृषि फार्म, मुलपानी, काठमाडौं | Tomato | Srijana | HS | 8/18/2079 | 100 | 0 | 0 | Trace | 98 | 0 | 1 | 0 | 1 | 8 | 0 | Vigor%= 83% |
| 104 | 104 | | Tomato | Khumal 2 | HS | | 100 | 0 | 0 | Trace | 79 | 1 | 16 | 0 | 4 | 8.2 | 0 | Vigor%= 68% |
| 105 | 105 | | Tomato | Khumal 3 | HS | | 100 | 0 | 0 | Trace | 76 | 6 | 7 | 0 | 11 | 8.6 | 0 | Vigor%= 66% |
| 106 | 106 | केन्द्रीय कृषि प्रयोगशाला, हरिहरभवन | Mustard | Manakamana | PS | 8/18/2079 | 0 | 0 | 0 | 0 | 70 | 4 | 14 | 0 | 12 | 0 | 0 | |
| 107 | 107 | | Mustard | Khumal Chaudapaat | PS | | 0 | 0 | 0 | 0 | 78 | 10 | 2 | 0 | 10 | 0 | 0 | |
| 108 | 108 | | Mustard | Khumal Rato | PS | | 0 | 0 | 0 | 0 | 32 | 5 | 19 | 0 | 44 | 0 | 0 | |
| 109 | 109 | | Mustard | Manakamana | PS | | 0 | 0 | 0 | 0 | 70 | 4 | 16 | 0 | 10 | 0 | 0 | |
| 110 | 110 | | Mustard | Khumal Chaudapaat | PS | | 0 | 0 | 0 | 0 | 77 | 9 | 3 | 0 | 11 | 0 | 0 | |
| 111 | 111 | | Mustard | Khumal Rato | PS | | 0 | 0 | 0 | 0 | 35 | 6 | 17 | 0 | 42 | 0 | 0 | |
| 112 | 112 | श्री नालदुंगा कृषि तथा बीउ उत्पादन सहकारी संस्था लिमिटेड, दोलखा | Maize | Rampur Composite | IS | 10/4/2079 | 0 | 0 | 0 | 0 | 93 | 2 | 0 | 0 | 5 | 0 | 0 | |
| 113 | 113 | | Maize | Ganesh 1 | IS | | 0 | 0 | 0 | 0 | 95 | 2 | 0 | 0 | 3 | 0 | 0 | |
| 114 | 114 | | Maize | Deuti | IS | | 0 | 0 | 0 | 0 | 97 | 1 | 0 | 0 | 2 | 0 | 0 | |
| 115 | 115 | | Rice | Khumal 10 | IS | | 0 | 0 | 0 | 0 | 40 | 42 | 10 | 0 | 8 | 0 | 0 | |
| 116 | 116 | | Rice | Khumal 4 | IS | | 0 | 0 | 0 | 0 | 78 | 16 | 4 | 0 | 2 | 0 | 0 | |
| 117 | 117 | | Rice | Khumal 13 | IS | | 0 | 0 | 0 | 0 | 91 | 5 | 1 | 0 | 3 | 0 | 0 | |
| 118 | 118 | | Fingermillet | Okhle | IS | | 0 | 0 | 0 | 0 | 29 | 1 | 68 | 0 | 2 | 0 | 0 | |
| 119 | 119 | | Fingermillet | Kabre 1 | IS | | 0 | 0 | 0 | 0 | 61 | 2 | 35 | 0 | 2 | 0 | 0 | |

| S.N. | Lab No. | Name and Address of Sender | Crop | Variety | Type | Sample Received | PURITY TEST (%) | | | | GERMINATION TEST (%) | | | | | MOISTURE TEST | 1000 SEED WEIGHT (gm) | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | Pure Seed | Other Crop seed | Weed Seed | Innert matter | Germn | Abnor. | Fresh | Hard | Dead | | | |
| 120 | 120 | | Fingermillet | Kabre 2 | IS | | 0 | 0 | 0 | 0 | 53 | 7 | 34 | 0 | 6 | 0 | 0 | |
| 121 | 121 | | Fingermillet | Sailunge | IS | | 0 | 0 | 0 | 0 | 25 | 1 | 69 | 0 | 5 | 0 | 0 | |
| 122 | 122 | राष्ट्रिय बाली बिज्ञान अनुसन्धान केन्द्र, खुमल्टार | Rice | Khumal 4 | FS | 10/12/2079 | 0 | 0 | 0 | 0 | 91 | 4 | 1 | 0 | 4 | 11.5 | 0 | |
| 123 | 123 | | Rice | Khumal 10 | FS | | 0 | 0 | 0 | 0 | 85 | 11 | 3 | 0 | 1 | 11.4 | 0 | |
| 124 | 124 | | Rice | Khumal 11 | FS | | 0 | 0 | 0 | 0 | 83 | 56 | 0 | 0 | 12 | 11.1 | 0 | |
| 125 | 125 | | Rice | Khumal 12 | FS | | 0 | 0 | 0 | 0 | 91 | 3 | 3 | 0 | 3 | 11.3 | 0 | |
| 126 | 126 | | Rice | Khumal 16 | FS | | 0 | 0 | 0 | 0 | 92 | 5 | 0 | 0 | 3 | 11.6 | 0 | |
| 127 | 127 | देविथान कृषि सहकारी संस्था लिमिटेड | Maize | Rampur Composite | TLS | 10/17/2079 | 99.9 | 0 | 0 | 0.1 | 95 | 1 | 0 | 0 | 4 | 15.1 | 0 | |
| 128 | 128 | राष्ट्रिय बाली प्रजनन् तथा आनुवंसिक अनुसन्धान केन्द्र, खुमलटार | Rice | Khumal 4 | BS | 10/17/2079 | 99.8 | 0 | 0 | 0.2 | 93 | 6 | 0 | 0 | 1 | 11.1 | 0 | |
| 129 | 129 | | Rice | Khumal 10 | BS | | 99.6 | 0 | 0 | 0.4 | 95 | 2 | 1 | 0 | 2 | 10.6 | 0 | |
| 130 | 130 | | Rice | Khumal 11 | BS | | 99.7 | 0 | 0 | 0.3 | 89 | 3 | 3 | 0 | 5 | 10.9 | 0 | |
| 131 | 131 | | Rice | Khumal 12 | BS | | 99.6 | 0 | 0 | 0.4 | 97 | 1 | 0 | 0 | 2 | 10.5 | 0 | |
| 132 | 132 | | Rice | Khumal 13 | BS | | 99.7 | 0 | 0 | 0.3 | 90 | 3 | 1 | 0 | 6 | 10.4 | 0 | |
| 133 | 133 | | Rice | Khumal 14 | BS | | 98.9 | 0 | 0 | 1.1 | 94 | 2 | 1 | 0 | 3 | 9.9 | 0 | |
| 134 | 134 | | Rice | Khumal Basmati 16 | BS | | 99.7 | 0 | 0 | 0.3 | 92 | 5 | 1 | 0 | 2 | 10.6 | 0 | |
| 135 | 135 | | Rice | Lekali 1 | BS | | 99.9 | 0 | 0 | 0.1 | 91 | 3 | 3 | 0 | 3 | 11.8 | 0 | |
| 136 | 136 | | Rice | Lekali 3 | BS | | 99.6 | 0 | 0 | 0.4 | 90 | 4 | 1 | 0 | 5 | 10.6 | 0 | |
| 137 | 137 | | Rice | Chandannath 3 | BS | | 99.4 | 0 | 0 | 0.6 | 89 | 3 | 2 | 0 | 6 | 10.7 | 0 | |
| 138 | 138 | | Rice | Khumal Basmati 16 | BS | | 98.6 | 0 | 0 | 1.4 | 90 | 5 | 4 | 0 | 1 | 11.3 | 0 | |
| 139 | 139 | | Rice | Chainung 242 | BS | | 99.9 | 0 | 0 | 0.1 | 95 | 2 | 1 | 0 | 2 | 10.7 | 0 | |
| 140 | 140 | निर्मल कृषि सहकारी सस्था लिमिटेड, सानो गाउँ, ललितपुर | Rice | Chainung 242 | IS | 10/19/2079 | 99.7 | 0 | 0 | 0.3 | 92 | 2 | 4 | 0 | 2 | 11.2 | 0 | |
| 141 | 141 | | Rice | Chainung 243 | IS | | 99.3 | 0 | 0 | 0.7 | 87 | 6 | 4 | 0 | 3 | 11.6 | 0 | |
| 142 | 142 | | Rice | Chainung 244 | IS | | 99.1 | 0 | 0 | 0.9 | 96 | 1 | 0 | 0 | 3 | 11.8 | 0 | |
| 143 | 143 | | Rice | Chainung 245 | IS | | 99.3 | 0 | 0 | 0.7 | 83 | 5 | 12 | 0 | 0 | 12.7 | 0 | |
| 144 | 144 | | Rice | Chainung 246 | IS | | 99.5 | 0 | 0 | 0.5 | 91 | 4 | 4 | 0 | 1 | 11.1 | 0 | |
| 145 | 145 | केन्द्रीय कृषि प्रयोगशाला, हरिहरभवन | Rice | Khumal 4 | PS | 11/2/2079 | 0 | 0 | 0 | 0 | 95 | 3 | 2 | 0 | 0 | 0 | 0 | |
| 146 | 146 | | Rice | Khumal 10 | PS | | 0 | 0 | 0 | 0 | 90 | 7 | 0 | 0 | 3 | 0 | 0 | |

| S.N. | Lab No. | Name and Address of Sender | Crop | Variety | Type | Sample Received | PURITY TEST (%) | | | | GERMINATION TEST (%) | | | | | MOISTURE TEST | 1000 SEED WEIGHT (gm) | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | Pure Seed | Other Crop seed | Weed Seed | Innert matter | Germn | Abnor. | Fresh | Hard | Dead | | | |
| 147 | 147 | | Rice | Khumal 11 | PS | | 0 | 0 | 0 | 0 | 91 | 3 | 0 | 0 | 6 | 0 | 0 | |
| 148 | 148 | राष्ट्रिय बाली प्रजनन् तथा आनुवंसिक अनुसन्धान केन्द्र, खुमलटार | Soybean | Chaingmow 6063 | SS | 11/8/2079 | 100 | 0 | 0 | Trace | 97 | 3 | 0 | 0 | 0 | 0 | 0 | |
| 149 | 149 | | Soybean | CN 60 | SS | | 100 | 0 | 0 | Trace | 99 | 1 | 0 | 0 | 0 | 0 | 0 | |
| 150 | 150 | | Soybean | G 4508 | SS | | 99.8 | 0.1 | 0 | Trace | 99 | 1 | 0 | 0 | 0 | 0 | 0 | |
| 151 | 151 | | Soybean | CM 9133 | SS | | 100 | 0 | 0 | 0 | 98 | 1 | 0 | 0 | 1 | 0 | 0 | |
| 152 | 152 | | Soybean | LS 77 16 16 | SS | | 99.9 | 0 | 0 | 0.1 | 97 | 2 | 0 | 0 | 1 | 0 | 0 | |
| 153 | 153 | | Soybean | Coll 3 | SS | | 99.7 | 0 | 0 | 0.3 | 98 | 2 | 0 | 0 | 0 | 0 | 0 | |
| 154 | 154 | एभरेष्ट सीड कम्पनी, खुमलटार | Rice | Khumal 4 | IS | 12/14/2079 | 98.9 | 0 | 0 | 1.1 | 92 | 4 | 1 | 0 | 3 | 10.8 | 0 | |
| 155 | 155 | | Rice | Khumal 10 | IS | | 99.9 | 0 | 0 | 0.5 | 96 | 2 | 1 | 0 | 1 | 11 | 0 | |
| 156 | 156 | | Rice | Khumal 11 | IS | | 99.9 | 0 | 0 | 0.1 | 96 | 3 | 0 | 0 | 1 | 11.1 | 0 | |
| 157 | 157 | | Rice | Chainung 242 | IS | | 99.6 | 0 | 0 | 0.4 | 97 | 2 | 0 | 0 | 1 | 10.1 | 0 | |
| 158 | 158 | राष्ट्रिय बीउ विज्ञान प्रबिधि अनुसन्धान केन्द्र, खुमलटार | Rice | Chainung 242 | RS | 1/3/2080 | 100 | 0 | 0 | 0 | 86 | 6 | 6 | 0 | 2 | 11.9 | 0 | |
| 159 | 159 | राष्ट्रिय मकैबाली अनुसन्धान कार्यक्रम, रामपुर | Maize | Rampur Composite | SS | 2/2/2080 | 99.6 | 0 | 0 | 0.4 | 94 | 3 | 0 | 0 | 3 | 9.7 | | |
| 160 | 160 | | Maize | Arun 2 | SS | | 100 | 0 | 0 | Trace | 99 | 0 | 0 | 0 | 1 | 11.3 | | |
| 161 | 161 | | Maize | Arun 4 | SS | | 100 | 0 | 0 | Trace | 99 | 0 | 0 | 0 | 1 | 10.7 | | |
| 162 | 162 | | Maize | Manakamana 3 | SS | | 99.8 | 0 | 0 | 0.2 | 98 | 1 | 0 | 0 | 1 | 11.6 | | |
| 163 | 163 | | Maize | Deuti | SS | | 99.6 | 0 | 0 | 0.4 | 98 | 1 | 0 | 0 | 1 | 12.4 | | |
| 164 | 164 | | Maize | Poshilo 1 | SS | | 99.6 | 0 | 0 | 0.4 | 93 | 2 | 2 | 0 | 3 | 11.8 | | |
| 165 | 165 | खत्री एग्रोभेट, झमाडोल | Rye grass | Dhunche | IS | 3/6/2080 | 87.1 | 0 | 0 | 12.9 | 87 | 1 | 5 | 0 | 7 | 10.6 | | |
| 166 | 166 | | Clover | White Clover | IS | | 87.9 | 0 | 0 | 12.1 | 84 | 7 | 2 | 0 | 7 | 6.6 | | |
| 167 | 167 | राष्ट्रिय पशु आहारा तथा लाईभस्टक गूण व्यवस्थापन प्रयोगशाला, हरिहरभवन | Oats | Nandani | IS | 3/20/2080 | 95.7 | 0.1 | Trace | 4.1 | 81 | 2 | 0 | 0 | 17 | 9.3 | | |
| 168 | 168 | | Oats | Amritdhara | IS | | 89.5 | 0.4 | Trace | 10 | 87 | 0 | 0 | 0 | 13 | 10.1 | | |

## Annex 12.2. Services provided (research sample), FY 2079/80 (2022/23)

| Lab No. | Name and Address of Sender | Kind | Variety | Class | GERMINATION TEST (%) | | | | | PURITY TEST (%) | | | | MOISTURE TEST (%) | Hydrion paper condition | | | | 1000 SEED WEIGHT (gm) | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Germn | Abnor. | Fresh | Hard | Dead | Pure Seed | Other Crop seed | Weed Seed | Innert matter | | 3 months | 6 months | 9 months | 12 months | | |
| R1 | Farmers Parsa District | Sarso | Local | IS | 97 | 1 | 1 | 1 | 0 | 64.0 | 24.2 | 11.4 | 0.4 | 8.5 | Blue | Blue | Blue | Blue | 3.2 | Farmer |
| R2 | Farmers Parsa District | Sarso | Local | IS | 95 | 1 | 2 | 0 | 2 | 98.5 | 0.5 | 0.0 | 1.0 | 7.9 | Blue | Blue | Blue | Blue | 3.1 | Farmer |
| R3 | Farmers Parsa District | Sarso | Local | IS | 94 | 3 | 2 | 0 | 1 | 96.1 | 0.0 | 0.8 | 3.1 | 8.5 | Blue | Blue | Blue | Blue | 3.0 | Farmer |
| R4 | Farmers Parsa District | Mung Bean | Local | IS | 76 | 4 | 0 | 0 | 20 | 99.2 | 0.0 | 0.0 | 0.8 | 12.5 | Blue | Blue | Pink | Pink | 43.6 | Farmer |
| R5 | Farmers Parsa District | Mung Bean | Local | IS | 78 | 9 | 7 | 1 | 5 | 95.0 | 0.0 | 0.0 | 5.0 | 12.2 | Blue | Blue | Pink | Pink | 42.2 | Farmer |
| R6 | Farmers Parsa District | Lentil | Local | IS | 96 | 1 | 1 | 0 | 2 | 98.5 | 0.7 | 0.0 | 0.8 | 10.2 | Blue | Blue | Blue | Blue | 14.6 | Farmer |
| R7 | Farmers Parsa District | Lentil | Local | IS | 95 | 1 | 4 | 0 | 0 | 89.0 | 6.0 | 4.5 | 0.5 | 10.1 | Blue | Blue | Blue | Blue | 19.5 | Farmer |
| R8 | Farmers Parsa District | Lentil | Local | IS | 93 | 1 | 2 | 2 | 2 | 87.9 | 5.9 | 5.7 | 0.6 | 10.8 | Pink | Pink | Pink | Pink | 18.9 | Farmer |
| R9 | Farmers Parsa District | Lentil | Local | IS | 93 | 0 | 2 | 2 | 3 | 90.6 | 4.9 | 3.7 | 0.8 | 10.5 | Blue | Blue | Pink | Pink | 19.1 | Farmer |
| R10 | Farmers Parsa District | Lentil | Local | IS | 93 | 1 | 2 | 3 | 1 | 86.0 | 9.9 | 3.4 | 0.8 | 10.3 | Blue | Blue | Blue | Pink | 18.4 | Farmer |
| R11 | Farmers Parsa District | Flax seed | Local | IS | 94 | 1 | 3 | 0 | 2 | 89.0 | 6.3 | 0.1 | 4.6 | 8.1 | Blue | Blue | Blue | Blue | 4.7 | Farmer |
| R12 | Farmers Parsa District | Flax seed | Local | IS | 91 | 2 | 4 | 0 | 3 | 93.3 | 2.3 | 0.0 | 4.4 | 8.5 | Blue | Blue | Blue | Blue | 4.7 | Farmer |
| R13 | Farmers Parsa District | Flax seed | Local | IS | 96 | 1 | 1 | 0 | 2 | 91.9 | 3.7 | 0.0 | 4.4 | 8.2 | Blue | Blue | Blue | Blue | 4.8 | Farmer |
| R14 | Farmers Parsa District | Flax seed | Local | IS | 93 | 1 | 2 | 0 | 4 | 98.7 | 0.0 | 0.0 | 1.3 | 8.7 | Blue | Blue | Blue | Blue | 2.9 | Farmer |
| R15 | Farmers Parsa District | Flax seed | Local | IS | 96 | 1 | 3 | 0 | 0 | 93.2 | 4.3 | 0.0 | 2.6 | 8.5 | Blue | Blue | Blue | Blue | 4.6 | Farmer |
| R16 | कृषि अनुसन्धान निर्देशनालाय, परवानीपुर | Flax seed | Local | IS | 93 | 1 | 2 | 1 | 3 | 97.0 | 1.6 | 0.1 | 1.3 | 8.2 | Blue | Blue | Blue | Blue | 4.5 | Farmer |
| R17 | कृषि अनुसन्धान निर्देशनालाय, परवानीपुर | Mustard | Local | IS | 91 | 5 | 3 | 0 | 1 | 98.8 | 0.0 | 0.0 | 1.2 | 9 | Blue | Blue | Blue | Pink | 3.2 | Farmer |
| R18 | कृषि अनुसन्धान निर्देशनालाय, परवानीपुर | Yellow Mustard | Local | IS | 95 | 1 | 0 | 4 | 0 | 94.3 | 0.0 | 0.0 | 5.7 | 8.2 | Blue | Blue | Blue | Blue | 3.4 | Farmer |
| R19 | कृषि अनुसन्धान निर्देशनालाय, परवानीपुर | Yellow Mustard | Local | IS | 95 | 1 | 1 | 1 | 2 | 95.3 | 0.9 | 0.0 | 3.8 | 8.2 | Blue | Blue | Blue | Blue | 4.7 | Farmer |

| Lab No. | Name and Address of Sender | Kind | Variety | Class | GERMINATION TEST (%) | | | | | PURITY TEST (%) | | | | MOISTURE TEST (%) | Hydrion paper condition | | | | 1000 SEED WEIGHT (gm) | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Germn | Abnor. | Fresh | Hard | Dead | Pure Seed | Other Crop seed | Weed Seed | Innert matter | | 3 months | 6 months | 9 months | 12 months | | |
| R20 | कृषि अनुसन्धान निर्देशनालाय, परवानीपुर | Mustard | Pragati (A) | | 89 | 9 | 0 | 1 | 1 | 96.4 | 0.0 | 0.2 | 3.4 | 8.9 | Blue | Blue | Pink | Pink | 3.1 | station |
| R21 | कृषि अनुसन्धान निर्देशनालाय, परवानीपुर | Mustard | Pragati (B) | | 94 | 1 | 2 | 0 | 3 | 98.8 | 0.0 | 0.0 | 1.2 | 8.5 | Blue | Blue | Pink | Pink | 3.6 | station |
| R22 | कृषि अनुसन्धान निर्देशनालाय, परवानीपुर | Mustard | Preeti (A) | | 91 | 4 | 2 | 0 | 3 | 96.4 | 0.1 | 0.0 | 3.5 | 8.2 | Blue | Blue | Blue | Pink | 3.2 | station |
| R23 | कृषि अनुसन्धान निर्देशनालाय, परवानीपुर | Mustard | Preeti (B) | | 79 | 4 | 7 | 3 | 7 | 99.1 | 0.0 | 0.0 | 0.9 | 9.5 | Blue | Pink | Pink | Pink | 3.0 | station |
| R24 | कृषि अनुसन्धान निर्देशनालाय, परवानीपुर | Lentil | Local | IS | 93 | 1 | 3 | 0 | 3 | 85.2 | 0.0 | 8.3 | 6.5 | 9.9 | Blue | Pink | Pink | Pink | 17.8 | Farmer |
| R25 | कृषि अनुसन्धान निर्देशनालाय, परवानीपुर | Lentil | Khajura 1 (A) | | 95 | 1 | 2 | 1 | 1 | 98.0 | 0.4 | 0.5 | 1.1 | 9.2 | Blue | Pink | Pink | Pink | 11.9 | station |
| R26 | कृषि अनुसन्धान निर्देशनालाय, परवानीपुर | Lentil | Khajura 1 (B) | | 91 | 4 | 5 | 0 | 0 | 98.3 | 0.3 | 0.5 | 0.9 | 10.1 | Blue | Pink | Pink | Pink | 12.2 | station |
| R27 | कृषि अनुसन्धान निर्देशनालाय, परवानीपुर | Lentil | Khajura 2 (A) | | 97 | 2 | 1 | 0 | 0 | 99.4 | 0.0 | 0.0 | 0.6 | 10.8 | Blue | Pink | Pink | Pink | 15.5 | station |
| R28 | कृषि अनुसन्धान निर्देशनालाय, परवानीपुर | Lentil | Khajura 2 (B) | | 95 | 3 | 1 | 0 | 1 | 98.8 | 0.5 | 0.0 | 0.6 | 10.6 | Blue | Pink | Pink | Pink | 16.6 | station |
| R29 | तेल बाली अनुसन्धान कार्यक्रम, नवलपुर, सर्लाही | Sarso | Ulta | | 71 | 8 | 0 | 0 | 21 | 99.8 | 0.0 | 0.0 | 0.2 | 8.2 | Blue | Blue | Blue | Blue | 2.6 | station |
| R30 | तेल बाली अनुसन्धान कार्यक्रम, नवलपुर, सर्लाही | Sarso | Not mentioned | | 86 | 4 | 0 | 0 | 10 | 100.0 | 0.0 | 0.0 | 0.0 | 8.3 | Blue | Blue | Blue | Blue | 2.6 | station |

| Lab No. | Name and Address of Sender | Kind | Variety | Class | GERMINATION TEST (%) | | | | | PURITY TEST (%) | | | | MOISTURE TEST (%) | Hydrion paper condition | | | | 1000 SEED WEIGHT (gm) | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Germn | Abnor. | Fresh | Hard | Dead | Pure Seed | Other Crop seed | Weed Seed | Innert matter | | 3 months | 6 months | 9 months | 12 months | | |
| R31 | तेल बाली अनुसन्धान कार्यक्रम, नवलपुर, सर्लाही | Mustard | Furan rayo | | 74 | 7 | 0 | 0 | 19 | 99.7 | 0.0 | 0.0 | 0.3 | 9.6 | Blue | Blue | Pink | Pink | 3.0 | station |
| R32 | तेल बाली अनुसन्धान कार्यक्रम, नवलपुर, सर्लाही | Mustard | Morang tori 2 | | 93 | 3 | 0 | 0 | 4 | 99.9 | 0.0 | 0.0 | 0.1 | 8.5 | Blue | Blue | Blue | Pink | 2.7 | station |
| R33 | तेल बाली अनुसन्धान कार्यक्रम, नवलपुर, सर्लाही | Mustard | Preeti | | 86 | 2 | 0 | 0 | 12 | 99.8 | 0.0 | 0.0 | 0.3 | 8.8 | Blue | Blue | Blue | Pink | 2.6 | station |
| R34 | तेल बाली अनुसन्धान कार्यक्रम, नवलपुर, सर्लाही | Mustard | Morang rayo | | 77 | 4 | 0 | 0 | 19 | 99.9 | 0.0 | 0.0 | 0.1 | 9.6 | Blue | Blue | Pink | Pink | 2.9 | station |
| R35 | तेल बाली अनुसन्धान कार्यक्रम, नवलपुर, सर्लाही | Mustard | Unnati | | 88 | 2 | 0 | 0 | 10 | 99.9 | 0.0 | 0.0 | 0.1 | 8.5 | Blue | Blue | Blue | Pink | 2.6 | station |
| R36 | तेल बाली अनुसन्धान कार्यक्रम, नवलपुर, सर्लाही | Mustard | Bikash | | 80 | 2 | 0 | 0 | 18 | 99.9 | 0.0 | 0.0 | 0.1 | 8.9 | Blue | Blue | Pink | Pink | 2.5 | station |
| R37 | तेल बाली अनुसन्धान कार्यक्रम, नवलपुर, सर्लाही | Mustard | Pusha Bold | | 67 | 10 | 0 | 0 | 23 | 98.0 | 0.0 | 0.0 | 2.0 | 10.5 | Blue | Pink | Pink | Pink | 3.2 | station |
| R38 | तेल बाली अनुसन्धान कार्यक्रम, नवलपुर, सर्लाही | Mustard | Pragati | | 86 | 2 | 0 | 0 | 12 | 98.5 | 0.0 | 0.0 | 1.5 | 9.5 | Blue | Blue | Pink | Pink | 2.6 | station |
| R39 | तेल बाली अनुसन्धान कार्यक्रम, नवलपुर, सर्लाही | Mustard | Ditya rayo | | 44 | 12 | 0 | 0 | 44 | 99.9 | 0.0 | 0.0 | 0.1 | 10.9 | Blue | Pink | Pink | Pink | 2.6 | station |
| R40 | तेल बाली अनुसन्धान कार्यक्रम, नवलपुर, सर्लाही | Mustard | Pusha Jaganath | | 74 | 7 | 0 | 0 | 19 | 99.7 | 0.0 | 0.0 | 0.3 | 9.9 | Blue | Pink | Pink | Pink | 3.0 | station |
| R41 | तेल बाली अनुसन्धान कार्यक्रम, नवलपुर, सर्लाही | Mustard | Nawalpur tori 4 | | 77 | 5 | 0 | 0 | 18 | 98.4 | 0.0 | 0.0 | 1.6 | 11.2 | Blue | Pink | Pink | Pink | 2.6 | station |

| Lab No. | Name and Address of Sender | Kind | Variety | Class | GERMINATION TEST (%) | | | | | PURITY TEST (%) | | | | MOISTURE TEST (%) | Hydrion paper condition | | | | 1000 SEED WEIGHT (gm) | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Germn | Abnor. | Fresh | Hard | Dead | Pure Seed | Other Crop seed | Weed Seed | Innert matter | | 3 months | 6 months | 9 months | 12 months | | |
| R42 | तेल बाली अनुसन्धान कार्यक्रम, नवलपुर, सर्लाही | Sesame | Unidentified | | 51 | 8 | 0 | 0 | 41 | 99.6 | 0.0 | 0.0 | 0.4 | 8.5 | Blue | Blue | Blue | Pink | 2.6 | station |
| R43 | तेल बाली अनुसन्धान कार्यक्रम, नवलपुर, सर्लाही | Sesame | Jhuse til | | 57 | 7 | 0 | 0 | 36 | 99.8 | 0.0 | 0.0 | 0.2 | 8.5 | Blue | Blue | Blue | Pink | 4.3 | station |
| R44 | तेल बाली अनुसन्धान कार्यक्रम, नवलपुर, सर्लाही | Sunflower | Unidentified | | 75 | 5 | 0 | 0 | 20 | 100.0 | 0.0 | 0.0 | 0.0 | 8.5 | Blue | Blue | Blue | Blue | 40.3 | station |
| R45 | तेल बाली अनुसन्धान कार्यक्रम, नवलपुर, सर्लाही | Ground nut | Badam | | 86 | 5 | 0 | 0 | 9 | 100.0 | 0.0 | 0.0 | 0.0 | 8.6 | Blue | Blue | Blue | Blue | 359.1 | station |
| R46 | Parwanipur, Bara | Chickpea | KPG 59 ICC#840508 | | 96 | 2 | 0 | 1 | 1 | 100.0 | 0.0 | 0.0 | 0.0 | 13.5 | Blue | Pink | Pink | Pink | 171.5 | station |
| R47 | Parwanipur, Bara | Chickpea | ICC X 840508-40 | | 93 | 3 | 1 | 0 | 3 | 100.0 | 0.0 | 0.0 | 0.0 | 9 | Blue | Blue | Pink | Pink | 181.6 | station |
| R48 | Parwanipur, Bara | Chickpea | BG 372 | | 93 | 1 | 2 | 0 | 4 | 100.0 | 0.0 | 0.0 | 0.0 | 8.4 | Blue | Blue | Blue | Pink | 184.5 | station |
| R49 | Parwanipur, Bara | Chickpea | ICC X 840508-31 | | 97 | 1 | 1 | 0 | 1 | 100.0 | 0.0 | 0.0 | 0.0 | 8.5 | Blue | Blue | Blue | Pink | 171.4 | station |
| R50 | Parwanipur, Bara | Chickpea | ICCV 97207 | | 88 | 1 | 5 | 0 | 6 | 100.0 | 0.0 | 0.0 | 0.0 | 8.8 | Blue | Blue | Blue | Pink | 180.9 | station |
| R51 | Parwanipur, Bara | Chickpea | Tara | | 94 | 1 | 3 | 0 | 2 | 100.0 | 0.0 | 0.0 | 0.0 | 8.3 | Blue | Blue | Blue | Pink | 166.1 | station |
| R52 | Parwanipur, Bara | Mung Bean | Mung Bean | | 62 | 3 | 0 | 1 | 34 | 100.0 | 0.0 | 0.0 | 0.0 | 12.8 | Blue | Blue | Pink | Pink | 41.2 | station |
| R53 | Parwanipur, Bara | Mung Bean | Mung Bean | | 84 | 2 | 1 | 0 | 13 | 100.0 | 0.0 | 0.0 | 0.0 | 11.5 | Blue | Blue | Pink | Pink | 39.0 | station |
| R54 | Parwanipur, Bara | Mung Bean | Mung Bean | | 81 | 5 | 0 | 0 | 14 | 100.0 | 0.0 | 0.0 | 0.0 | 11.6 | Blue | Blue | Pink | Pink | 40.2 | station |
| R55 | Parwanipur, Bara | Mung Bean | Mung Bean | | 90 | 2 | 1 | 0 | 7 | 100.0 | 0.0 | 0.0 | 0.0 | 10.9 | Blue | Blue | Pink | Pink | 35.6 | station |
| R56 | Parwanipur, Bara | Mung Bean | Mung Bean | | 89 | 3 | 0 | 0 | 8 | 100.0 | 0.0 | 0.0 | 0.0 | 11.8 | Blue | Blue | Pink | Pink | 36.7 | station |

| Lab No. | Name and Address of Sender | Kind | Variety | Class | GERMINATION TEST (%) | | | | | PURITY TEST (%) | | | | MOISTURE TEST (%) | Hydrion paper condition | | | | 1000 SEED WEIGHT (gm) | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Germn | Abnor. | Fresh | Hard | Dead | Pure Seed | Other Crop seed | Weed Seed | Innert matter | | 3 months | 6 months | 9 months | 12 months | | |
| R57 | Parwanipur, Bara | Mung Bean | Mung Bean | | 59 | 13 | 0 | 0 | 28 | 100.0 | 0.0 | 0.0 | 0.0 | 12.5 | Blue | Blue | Pink | Pink | 39.5 | station |
| R58 | Parwanipur, Bara | Kidney Bean | Ambar | | 44 | 9 | 3 | 0 | 44 | 100.0 | 0.0 | 0.0 | 0.0 | 11.12.5 | Blue | Blue | Pink | Pink | 396.8 | station |
| R59 | Parwanipur, Bara | Kidney Bean | Utkarsh | | 56 | 16 | 0 | 0 | 28 | 100.0 | 0.0 | 0.0 | 0.0 | 12.1 | Blue | Pink | Pink | Pink | 390.5 | station |
| R60 | Parwanipur, Bara | Kidney Bean | Arun 2 | | 94 | 1 | 2 | 0 | 3 | 100.0 | 0.0 | 0.0 | 0.0 | 11.9 | Blue | Blue | Pink | Pink | 433.4 | station |
| R61 | Parwanipur, Bara | Kidney Bean | PDR 14 | | 89 | 1 | 6 | 0 | 4 | 100.0 | 0.0 | 0.0 | 0.0 | 11 | Blue | Blue | Pink | Pink | 425.1 | station |
| R62 | Parwanipur, Bara | Mustard | mix | IS | 88 | 2 | 0 | 0 | 10 | 99.9 | 0.0 | 0.0 | 0.1 | 8.9 | Blue | Blue | Blue | Pink | 3.9 | station |
| R63 | Parwanipur, Bara | Mustard | mix | IS | 83 | 1 | 0 | 0 | 16 | 100.0 | 0.0 | 0.0 | 0.0 | 9.1 | Blue | Blue | Blue | Pink | 2.8 | station |
| R64 | Parwanipur, Bara | Sarso | mix | IS | 88 | 2 | 0 | 0 | 10 | 99.8 | 0.0 | 0.0 | 0.2 | 10.5 | Blue | Pink | Pink | Pink | 2.9 | station |
| R65 | Parwanipur, Bara | Pea | local | IS | 91 | 2 | 0 | 0 | 7 | 100.0 | 0.0 | 0.0 | 0.0 | 8.2 | Blue | Blue | Blue | Pink | 116.6 | Farmer |
| R66 | Badhaiyatal 8, Bardiya, Gulariya nagarpalika | Pea | White pea local | | 99 | 1 | 0 | 0 | 0 | 100.0 | 0.0 | 0.0 | 0.0 | 9.1 | Blue | Blue | Blue | Pink | 188.8 | Farmer |
| R67 | Badhaiyatal 8, Bardiya, Gulariya nagarpalika | Pea | local | IS | 90 | 3 | 0 | 0 | 7 | 99.9 | 0.0 | 0.0 | 0.1 | 8.9 | Blue | Blue | Blue | Pink | 140.1 | Farmer |
| R68 | Badhaiyatal 8, Bardiya, Gulariya nagarpalika | Pea | Small pea, local | IS | 99 | 1 | 0 | 0 | 0 | 99.9 | 0.0 | 0.0 | 0.1 | 9.2 | Blue | Blue | Blue | Pink | 90.7 | Farmer |
| R69 | Badhaiyatal 8, Bardiya, Gulariya nagarpalika | Chickpea | Local | IS | 93 | 3 | 2 | 0 | 2 | 100.0 | 0.0 | 0.0 | 0.0 | 8.6 | Blue | Blue | Blue | Blue | 138.1 | Farmer |
| R70 | Badhaiyatal 8, Bardiya, Gulariya nagarpalika | Lentil | Local | IS | 96 | 1 | 0 | 2 | 1 | 99.9 | 0.0 | 0.0 | 0.1 | 10.5 | Blue | Blue | Blue | Pink | 16.4 | Farmer |
| R71 | Badhaiyatal 8, Bardiya, Gulariya nagarpalika | Sesame | White sesame | | 13 | 8 | 8 | 0 | 71 | 91.7 | 0.0 | 0.0 | 8.3 | 8.2 | Blue | Blue | Blue | Blue | 2.0 | Farmer |
| R72 | Badhaiyatal 8, Bardiya, Gulariya nagarpalika | Mustard | Local | IS | 83 | 3 | 0 | 0 | 14 | 99.8 | 0.0 | 0.0 | 0.2 | 9.6 | Blue | Blue | Blue | Pink | 2.6 | Farmer |
| R73 | Badhaiyatal 8, Bardiya, Gulariya nagarpalika | Gopi tori | Local | IS | 72 | 7 | 0 | 0 | 21 | 100.0 | 0.0 | 0.0 | 0.0 | 10.5 | Blue | Blue | Blue | Pink | 2.4 | Farmer |
| R74 | Badhaiyatal 8, Bardiya, Gulariya nagarpalika | Mustard | Local | IS | 85 | 8 | 2 | 0 | 5 | 98.8 | 0.0 | 0.0 | 1.2 | 9.6 | Blue | Blue | Blue | Pink | 3.1 | Farmer |

| Lab No. | Name and Address of Sender | Kind | Variety | Class | GERMINATION TEST (%) | | | | | PURITY TEST (%) | | | | MOISTURE TEST (%) | Hydrion paper condition | | | | 1000 SEED WEIGHT (gm) | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Germn | Abnor. | Fresh | Hard | Dead | Pure Seed | Other Crop seed | Weed Seed | Innert matter | | 3 months | 6 months | 9 months | 12 months | | |
| R75 | Badhaiyatal 8, Bardiya, Gulariya nagarpalika | Mustard | Local | IS | 91 | 3 | 2 | 0 | 4 | 99.8 | 0.0 | 0.0 | 0.2 | 8.9 | Blue | Blue | Blue | Pink | 3.1 | Farmer |
| R76 | Badhaiyatal 8, Bardiya, Gulariya nagarpalika | Ground nut | Local | IS | 89 | 3 | 0 | 0 | 8 | 100.0 | 0.0 | 0.0 | 0.0 | 8.9 | Blue | Blue | Blue | Pink | 307.6 | Farmer |
| R77 | Badhaiyatal 8, Bardiya, Gulariya nagarpalika | Coriandor | Local | IS | 0 | 0 | 0 | 0 | 100 | 99.9 | 0.0 | 0.0 | 0.1 | 10 | Pink | Pink | Pink | Pink | 9.2 | Farmer |
| R78 | Badhaiyatal 8, Bardiya, Gulariya nagarpalika | Sarso | Local | IS | 76 | 12 | 9 | 3 | 0 | 96.4 | 0.0 | 0.0 | 3.6 | 8.4 | Blue | Blue | Blue | Blue | 3.0 | Farmer |
| R79 | Badhaiyatal 8, Bardiya, Gulariya nagarpalika | Mustard | Local | IS | 89 | 2 | 0 | 0 | 9 | 96.4 | 0.0 | 0.0 | 3.6 | 8.5 | Blue | Blue | Blue | Blue | 3.1 | Farmer |
| R80 | Badhaiyatal 8, Bardiya, Gulariya nagarpalika | Mustard | Local | IS | 88 | 2 | 2 | 0 | 8 | 99.4 | 0.0 | 0.0 | 0.6 | 8.8 | Blue | Blue | Blue | Pink | 3.0 | Farmer |
| R81 | Badhaiyatal 8, Bardiya, Gulariya nagarpalika | Mustard | Thulo tori, local | IS | 88 | 4 | 0 | 0 | 8 | 99.6 | 0.0 | 0.0 | 0.4 | 8.6 | Blue | Blue | Blue | Pink | 3.4 | Farmer |
| R82 | Badhaiyatal 8, Bardiya, Gulariya nagarpalika | Flax seed | Aalas, local | IS | 97 | 0 | 0 | 0 | 3 | 98.8 | 0.0 | 0.0 | 1.2 | 8.1 | Blue | Blue | Blue | Blue | 4.3 | Farmer |
| R83 | Badhaiyatal 8, Bardiya, Gulariya nagarpalika | Flax seed | local | IS | 94 | 2 | 0 | 0 | 4 | 96.8 | 0.0 | 2.6 | 0.5 | 9.5 | Blue | Blue | Pink | Pink | 4.1 | Farmer |
| R84 | Badhaiyatal 8, Bardiya, Gulariya nagarpalika | Gram | local | IS | 91 | 1 | 0 | 0 | 8 | 99.9 | 0.0 | 0.0 | 0.1 | 10.5 | Blue | Pink | Pink | Pink | 39.0 | Farmer |
| R85 | Badhaiyatal 8, Bardiya, Gulariya nagarpalika | Gram | local | IS | 64 | 9 | 0 | 0 | 27 | 99.8 | 0.0 | 0.0 | 0.2 | 9.1 | Blue | Blue | Pink | Pink | 35.4 | Farmer |
| R86 | Badhaiyatal 8, Bardiya, Gulariya nagarpalika | Cowpea | Gajale | | 40 | 2 | 0 | 0 | 58 | 99.9 | 0.0 | 0.0 | 0.1 | 14.5 | Pink | Pink | Pink | Pink | 140.2 | Farmer |
| R87 | Badhaiyatal 8, Bardiya, Gulariya nagarpalika | Pea | Small pea, local | IS | 89 | 5 | 0 | 0 | 6 | 100.0 | 0.0 | 0.0 | 0.0 | 9.1 | Blue | Blue | Blue | Pink | 92.3 | Farmer |
| R88 | Badhaiyatal 8, Bardiya, Gulariya nagarpalika | Pea | Big pea, local | IS | 98 | 1 | 0 | 0 | 1 | 100.0 | 0.0 | 0.0 | 0.0 | 9.1 | Blue | Blue | Blue | Pink | 308.7 | Farmer |
| R89 | Badhaiyatal 8, Bardiya, Gulariya nagarpalika | अदेरी | local | IS | 54 | 2 | 18 | 0 | 26 | 100.0 | 0.0 | 0.0 | 0.0 | 9.6 | Blue | Blue | Pink | Pink | 83.5 | Farmer |
| R90 | Badhaiyatal 8, Bardiya, Gulariya nagarpalika | Chickpea | local | IS | 99 | 1 | 0 | 0 | 0 | 100.0 | 0.0 | 0.0 | 0.0 | 8.4 | Blue | Blue | Blue | Blue | 108.9 | Farmer |

| Lab No. | Name and Address of Sender | Kind | Variety | Class | GERMINATION TEST (%) | | | | | PURITY TEST (%) | | | | MOISTURE TEST (%) | Hydrion paper condition | | | | 1000 SEED WEIGHT (gm) | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Germn | Abnor. | Fresh | Hard | Dead | Pure Seed | Other Crop seed | Weed Seed | Innert matter | | 3 months | 6 months | 9 months | 12 months | | |
| R91 | Badhaiyatal 8, Bardiya, Gulariya nagarpalika | Chickpea | local | IS | 93 | 3 | 1 | 0 | 3 | 100.0 | 0.0 | 0.0 | 0.0 | 8.2 | Blue | Blue | Blue | Blue | 122.3 | Farmer |
| R92 | Badhaiyatal 8, Bardiya, Gulariya nagarpalika | Chickpea | Big chickpea, local | IS | 95 | 1 | 3 | 0 | 1 | 100.0 | 0.0 | 0.0 | 0.0 | 8 | Blue | Blue | Blue | Blue | 233.2 | Farmer |
| R93 | Badhaiyatal 8, Bardiya, Gulariya nagarpalika | Lentil | local | IS | 93 | 1 | 1 | 0 | 5 | 99.8 | 0.0 | 0.0 | 0.2 | 9.9 | Blue | Blue | Blue | Blue | 17.9 | Farmer |
| R94 | Badhaiyatal 8, Bardiya, Gulariya nagarpalika | Lentil | local | IS | 96 | 2 | 1 | 0 | 1 | 99.8 | 0.0 | 0.0 | 0.2 | 11.2 | Blue | Blue | Pink | Pink | 15.4 | Farmer |
| R95 | Badhaiyatal 8, Bardiya, Gulariya nagarpalika | Lentil | local | IS | 95 | 2 | 1 | 0 | 2 | 99.5 | 0.0 | 0.1 | 0.4 | 10.5 | Blue | Blue | Pink | Pink | 15.7 | Farmer |
| R96 | कृषि अनुसन्धान निर्देशनालाय, खजुरा, बाँके | Mustard | Bikash | | 90 | 6 | 0 | 0 | 4 | 99.9 | 0.0 | 0.0 | 0.1 | 8.6 | Blue | Blue | Blue | Blue | 3.6 | station |
| R97 | कृषि अनुसन्धान निर्देशनालाय, खजुरा, बाँके | Mung Bean | Pal 5 | BS | 100 | 0 | 0 | 0 | 0 | 99.9 | 0.0 | 0.0 | 0.1 | 9.9 | Blue | Blue | Blue | Pink | 36.1 | station |
| R98 | कृषि अनुसन्धान निर्देशनालाय, खजुरा, बाँके | Mung Bean | Pratikchya | BS | 96 | 2 | 1 | 0 | 1 | 99.9 | 0.0 | 0.0 | 0.1 | 9.9 | Blue | Blue | Blue | Pink | 41.5 | station |
| R99 | कृषि अनुसन्धान निर्देशनालाय, खजुरा, बाँके | Mung Bean | Pratigya | BS | 95 | 1 | 0 | 0 | 4 | 99.9 | 0.0 | 0.0 | 0.1 | 9.5 | Blue | Blue | Blue | Pink | 42.8 | station |
| R100 | कृषि अनुसन्धान निर्देशनालाय, खजुरा, बाँके | Kidney Bean | PDR 14 | BS | 100 | 0 | 0 | 0 | 0 | 100.0 | 0.0 | 0.0 | 0.0 | 11.1 | Blue | Blue | Pink | Pink | 429.8 | station |
| R101 | कृषि अनुसन्धान निर्देशनालाय, खजुरा, बाँके | Pigeon pea-रहर | Bageswori | BS | 96 | 1 | 2 | 0 | 1 | 100.0 | 0.0 | 0.0 | 0.0 | 10.6 | Blue | Blue | Blue | Pink | 81.9 | station |
| R102 | कृषि अनुसन्धान निर्देशनालाय, खजुरा, बाँके | Pigeon pea-रहर | MA 6 | BS | 92 | 1 | 5 | 0 | 2 | 100.0 | 0.0 | 0.0 | 0.0 | 9.5 | Blue | Blue | Blue | Pink | 107.7 | station |

| Lab No. | Name and Address of Sender | Kind | Variety | Class | GERMINATION TEST (%) | | | | | PURITY TEST (%) | | | | MOISTURE TEST (%) | Hydrion paper condition | | | | 1000 SEED WEIGHT (gm) | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Germn | Abnor. | Fresh | Hard | Dead | Pure Seed | Other Crop seed | Weed Seed | Innert matter | | 3 months | 6 months | 9 months | 12 months | | |
| R103 | कृषि अनुसन्धान निर्देशनालाय, खजुरा, बाँके | Gram | BLG 0093 1 | BS | 88 | 5 | 2 | 0 | 5 | 100.0 | 0.0 | 0.0 | 0.0 | 9.6 | Blue | Blue | Blue | Pink | 38.3 | station |
| R104 | कृषि अनुसन्धान निर्देशनालाय, खजुरा, बाँके | बेसरी रतन | बेसरी रतन | BS | 98 | 2 | 0 | 0 | 0 | 100.0 | 0.0 | 0.0 | 0.0 | 13.5 | Pink | Pink | Pink | Pink | 62.9 | station |
| R105 | कृषि अनुसन्धान निर्देशनालाय, खजुरा, बाँके | Lentil | Khajura 1 | BS | 100 | 0 | 0 | 0 | 0 | 100.0 | 0.0 | 0.0 | 0.0 | 9.6 | Blue | Blue | Pink | Pink | 15.0 | station |
| R106 | कृषि अनुसन्धान निर्देशनालाय, खजुरा, बाँके | Lentil | Maheshwo ri Bharati | BS | 98 | 1 | 1 | 0 | 0 | 100.0 | 0.0 | 0.0 | 0.0 | 8.5 | Blue | Blue | Blue | Pink | 16.8 | station |
| R107 | कृषि अनुसन्धान निर्देशनालाय, खजुरा, बाँके | Lentil | Khajura 2 | BS | 99 | 0 | 0 | 0 | 1 | 100.0 | 0.0 | 0.0 | 0.0 | 8.2 | Blue | Blue | Blue | Blue | 15.8 | station |
| R108 | कृषि अनुसन्धान निर्देशनालाय, खजुरा, बाँके | Lentil | Shrada kaalo | BS | 94 | 2 | 0 | 0 | 4 | 100.0 | 0.0 | 0.0 | 0.0 | 8.6 | Blue | Blue | Blue | Pink | 12.9 | station |
| R109 | कृषि अनुसन्धान निर्देशनालाय, खजुरा, बाँके | Lentil | Simal | BS | 99 | 0 | 1 | 0 | 0 | 100.0 | 0.0 | 0.0 | 0.0 | 8.1 | Blue | Blue | Blue | Blue | 13.3 | station |
| R110 | कृषि अनुसन्धान निर्देशनालाय, खजुरा, बाँके | Lentil | Khajura 3 | BS | 100 | 0 | 0 | 0 | 0 | 100.0 | 0.0 | 0.0 | 0.0 | 8.6 | Blue | Blue | Blue | Pink | 13.1 | station |
| R111 | कृषि अनुसन्धान निर्देशनालाय, खजुरा, बाँके | Cowpea | Male Patan 1 | FS | 90 | 6 | 1 | 0 | 3 | 100.0 | 0.0 | 0.0 | 0.0 | 8.5 | Blue | Blue | Pink | Pink | 150.8 | station |
| R112 | कृषि अनुसन्धान निर्देशनालाय, खजुरा, बाँके | Cowpea | Prakash | FS | 100 | 0 | 0 | 0 | 0 | 100.0 | 0.0 | 0.0 | 0.0 | 8.1 | Blue | Blue | Blue | Pink | 113.6 | station |
| R113 | कृषि अनुसन्धान निर्देशनालाय, खजुरा, बाँके | Cowpea | Surya | FS | 93 | 3 | 1 | 0 | 3 | 100.0 | 0.0 | 0.0 | 0.0 | 8.2 | Blue | Blue | Blue | Pink | 139.9 | station |

| Lab No. | Name and Address of Sender | Kind | Variety | Class | GERMINATION TEST (%) | | | | | PURITY TEST (%) | | | | MOISTURE TEST (%) | Hydrion paper condition | | | | 1000 SEED WEIGHT (gm) | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Germn | Abnor. | Fresh | Hard | Dead | Pure Seed | Other Crop seed | Weed Seed | Innert matter | | 3 months | 6 months | 9 months | 12 months | | |
| R114 | कृषि अनुसन्धान निर्देशनालाय, खजुरा, बाँके | Pea | local | IS | 88 | 0 | 4 | 0 | 8 | 100.0 | 0.0 | 0.0 | 0.0 | 8.8 | Blue | Blue | Pink | Pink | 153.6 | Farmer |
| R115 | Tulsipur, Dang District | Chickpea | local | IS | 95 | 2 | 0 | 0 | 3 | 89.4 | 4.6 | 0.0 | 5.9 | 8.2 | Blue | Blue | Blue | Blue | 114.6 | Farmer |
| R116 | Tulsipur, Dang District | Chickpea | local | IS | 99 | 0 | 0 | 0 | 1 | 96.2 | 3.5 | 0.0 | 0.3 | 8.1 | Blue | Blue | Blue | Blue | 126.6 | Farmer |
| R117 | Tulsipur, Dang District | Chickpea | local | IS | 97 | 0 | 0 | 0 | 3 | 99.3 | 0.0 | 0.0 | 0.7 | 8.1 | Blue | Blue | Blue | Blue | 117.9 | Farmer |
| R118 | Tulsipur, Dang District | Chickpea | Local | IS | 98 | 1 | 0 | 0 | 1 | 99.2 | 0.2 | 0.0 | 0.6 | 8.5 | Blue | Blue | Blue | Pink | 129.3 | Farmer |
| R119 | Tulsipur, Dang District | Chickpea | Local | IS | 95 | 1 | 0 | 0 | 4 | 99.0 | 0.2 | 0.0 | 0.8 | 8.5 | Blue | Blue | Blue | Pink | 109.3 | Farmer |
| R120 | Tulsipur, Dang District | Soybean | White soybean, local | IS | 0 | 0 | 0 | 0 | 100 | 99.7 | 0.0 | 0.0 | 0.3 | 12.4 | Pink | Pink | Pink | Pink | 175.7 | Farmer |
| R121 | Tulsipur, Dang District | Pea | White, local | IS | 99 | 1 | 0 | 0 | 0 | 96.3 | 3.3 | 0.1 | 0.3 | 8.5 | Blue | Blue | Blue | Pink | 156.2 | Farmer |
| R122 | Tulsipur, Dang District | Pea | local | IS | 96 | 1 | 0 | 0 | 3 | 88.4 | 11.2 | 0.0 | 0.3 | 10.2 | Blue | Blue | Pink | Pink | 91.9 | Farmer |
| R123 | Tulsipur, Dang District | Pea | Local | IS | 94 | 1 | 0 | 0 | 5 | 98.8 | 0.6 | 0.0 | 0.6 | 10.5 | Blue | Blue | Pink | Pink | 179.4 | Farmer |
| R124 | Tulsipur, Dang District | Pea | Local | IS | 97 | 0 | 0 | 0 | 3 | 93.8 | 1.5 | 0.0 | 4.7 | 11.2 | Blue | Blue | Pink | Pink | 159.8 | Farmer |
| R125 | Tulsipur, Dang District | Pea | Local | IS | 91 | 3 | 0 | 0 | 6 | 92.5 | 0.3 | 0.1 | 7.2 | 10.2 | Blue | Blue | Pink | Pink | 199.7 | Farmer |
| R126 | Tulsipur, Dang District | Pea | Local | IS | 96 | 1 | 0 | 0 | 3 | 91.1 | 3.5 | 0.0 | 5.4 | 10.5 | Blue | Blue | Pink | Pink | 159.2 | Farmer |
| R127 | Tulsipur, Dang District | उर्द मास | Local | IS | 81 | 0 | 0 | 0 | 19 | 96.6 | 0.0 | 0.0 | 3.4 | 9.5 | Blue | Blue | Blue | Pink | 38.1 | Farmer |
| R128 | Tulsipur, Dang District | उर्द मास | Local | IS | 90 | 0 | 0 | 0 | 10 | 99.4 | 0.0 | 0.0 | 0.6 | 9.6 | Blue | Blue | Blue | Pink | 42.5 | Farmer |
| R129 | Tulsipur, Dang District | उर्द मास | Local | IS | 56 | 2 | 0 | 32 | 10 | 96.5 | 0.0 | 0.0 | 3.5 | 10.3 | Blue | Blue | Pink | Pink | 38.9 | Farmer |
| R130 | Tulsipur, Dang District | उर्द मास | Black, local | IS | 96 | 1 | 0 | 0 | 3 | 99.1 | 0.0 | 0.0 | 0.9 | 9.8 | Blue | Blue | Pink | Pink | 40.2 | Farmer |
| R131 | Tulsipur, Dang District | राम चना | local | IS | 91 | 0 | 2 | 0 | 7 | 98.9 | 0.4 | 0.0 | 0.7 | 10.2 | Blue | Pink | Pink | Pink | 100.0 | Farmer |
| R132 | Tulsipur, Dang District | Flax seed | local | IS | 97 | 0 | 0 | 0 | 3 | 98.0 | 0.4 | 0.1 | 1.5 | 8.9 | Blue | Blue | Blue | Pink | 4.2 | Farmer |
| R133 | Tulsipur, Dang District | Flax seed | local | IS | 100 | 0 | 0 | 0 | 0 | 98.3 | 0.4 | 0.0 | 1.3 | 8.9 | Blue | Blue | Blue | Pink | 4.3 | Farmer |
| R134 | Tulsipur, Dang District | Flax seed | local | IS | 96 | 1 | 0 | 0 | 3 | 84.6 | 9.3 | 0.0 | 6.0 | 9.6 | Blue | Blue | Blue | Pink | 5.2 | Farmer |
| R135 | Tulsipur, Dang District | Flax seed | local | IS | 97 | 1 | 0 | 0 | 2 | 97.8 | 0.7 | 0.0 | 1.4 | 9.4 | Blue | Blue | Blue | Pink | 5.4 | Farmer |
| R136 | Tulsipur, Dang District | Flax seed | local | IS | 94 | 1 | 0 | 0 | 5 | 95.4 | 2.7 | 0.0 | 1.9 | 8.5 | Blue | Blue | Blue | Pink | 4.7 | Farmer |
| R137 | Tulsipur, Dang District | Lentil | local | IS | 82 | 1 | 0 | 0 | 17 | 93.3 | 4.0 | 0.0 | 2.7 | 8.9 | Blue | Blue | Blue | Pink | 16.5 | Farmer |
| R138 | Tulsipur, Dang District | Lentil | local | IS | 80 | 1 | 1 | 0 | 18 | 91.0 | 7.8 | 0.0 | 1.3 | 8.9 | Blue | Blue | Blue | Pink | 17.7 | Farmer |

| Lab No. | Name and Address of Sender | Kind | Variety | Class | GERMINATION TEST (%) | | | | | PURITY TEST (%) | | | | MOISTURE TEST (%) | Hydrion paper condition | | | | 1000 SEED WEIGHT (gm) | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Germn | Abnor. | Fresh | Hard | Dead | Pure Seed | Other Crop seed | Weed Seed | Innert matter | | 3 months | 6 months | 9 months | 12 months | | |
| R139 | Tulsipur, Dang District | Lentil | local | IS | 95 | 2 | 1 | 0 | 2 | 96.6 | 2.2 | 0.0 | 1.2 | 8.5 | Blue | Blue | Blue | Blue | 16.2 | Farmer |
| R140 | Tulsipur, Dang District | Lentil | local | IS | 88 | 3 | 0 | 4 | 5 | 95.6 | 3.9 | 0.0 | 0.5 | 9.1 | Blue | Blue | Blue | Pink | 17.3 | Farmer |
| R141 | Tulsipur, Dang District | Lentil | local | IS | 97 | 1 | 0 | 0 | 2 | 86.4 | 12.1 | 0.0 | 1.5 | 8.5 | Blue | Blue | Blue | Blue | 17.0 | Farmer |
| R142 | Tulsipur, Dang District | Lentil | local | IS | 93 | 1 | 0 | 2 | 4 | 95.0 | 3.9 | 0.0 | 1.1 | 8.9 | Blue | Blue | Blue | Pink | 16.0 | Farmer |
| R143 | Tulsipur, Dang District | Lentil | local | IS | 19 | 1 | 0 | 19 | 61 | 97.1 | 0.1 | 0.0 | 2.8 | 10.9 | Blue | Blue | Blue | Pink | 15.8 | Farmer |
| R144 | Tulsipur, Dang District | Sesame | local | IS | 83 | 3 | 0 | 4 | 10 | 97.6 | 0.7 | 0.0 | 1.7 | 8.9 | Blue | Blue | Blue | Pink | 2.6 | Farmer |
| R145 | Tulsipur, Dang District | Mustard | Unnati | IS | 95 | 2 | 0 | 0 | 3 | 99.3 | 0.0 | 0.0 | 0.7 | 8.5 | Blue | Blue | Blue | Blue | 3.2 | Farmer |
| R146 | Tulsipur, Dang District | Mustard | Unnati | IS | 97 | 1 | 0 | 0 | 2 | 100.0 | 0.0 | 0.0 | 0.0 | 8.2 | Blue | Blue | Blue | Blue | 3.2 | Farmer |
| R147 | Tulsipur, Dang District | Mustard | local | IS | 98 | 1 | 0 | 0 | 1 | 100.0 | 0.0 | 0.0 | 0.0 | 8.1 | Blue | Blue | Blue | Blue | 3.8 | Farmer |
| R148 | Tulsipur, Dang District | Mustard | local | IS | 93 | 1 | 0 | 0 | 6 | 98.9 | 0.0 | 0.0 | 1.1 | 8 | Blue | Blue | Blue | Blue | 3.8 | Farmer |
| R149 | Tulsipur, Dang District | Mustard | local | IS | 93 | 1 | 0 | 0 | 6 | 98.5 | 0.2 | 0.0 | 1.3 | 8.5 | Blue | Blue | Blue | Blue | 2.2 | Farmer |
| R150 | Tulsipur, Dang District | Mustard | local | IS | 99 | 1 | 0 | 0 | 0 | 100.0 | 0.0 | 0.0 | 0.0 | 8.5 | Blue | Blue | Blue | Blue | 3.6 | Farmer |
| R151 | Tulsipur, Dang District | Mustard | Unnati | IS | 96 | 1 | 0 | 0 | 3 | 100.0 | 0.0 | 0.0 | 0.0 | 8.5 | Blue | Blue | Blue | Blue | 3.4 | Farmer |
| R152 | Tulsipur, Dang District | Mustard | Gopi Tori | IS | 94 | 2 | 0 | 1 | 3 | 97.9 | 0.4 | 0.0 | 1.6 | 8.3 | Blue | Blue | Blue | Blue | 2.6 | Farmer |
| R153 | Tulsipur, Dang District | Mustard | Unnati | IS | 95 | 0 | 0 | 0 | 5 | 99.9 | 0.0 | 0.0 | 0.1 | 8.5 | Blue | Blue | Blue | Blue | 3.3 | Farmer |
| R154 | Tulsipur, Dang District | Mustard | Unnati | IS | 96 | 1 | 0 | 1 | 2 | 99.6 | 0.0 | 0.0 | 0.4 | 8.2 | Blue | Blue | Blue | Blue | 3.4 | Farmer |
| R155 | Tulsipur, Dang District | Mustard | local | IS | 71 | 4 | 0 | 0 | 25 | 98.3 | 0.0 | 0.0 | 1.7 | 8.9 | Blue | Blue | Blue | Pink | 2.8 | Farmer |
| R156 | Tulsipur, Dang District | Mustard | Chinese Tori | IS | 34 | 5 | 0 | 8 | 53 | 99.8 | 0.0 | 0.0 | 0.2 | 8.9 | Blue | Blue | Blue | Pink | 2.9 | Farmer |
| R157 | Tulsipur, Dang District | Mustard | Unnati | IS | 98 | 0 | 0 | 0 | 2 | 99.6 | 0.0 | 0.0 | 0.4 | 8.5 | Blue | Blue | Blue | Pink | 3.6 | Farmer |
| R158 | राष्ट्रिय धान बाली अनुसन्धान केन्द्र, हर्दिनाथ | Rice | Hardinath Hybrid 1 | HS | 75 | 8 | 0 | 3 | 14 | 99.2 | 0.0 | 0.0 | 0.8 | 13.4 | Pink | Pink | Pink | Pink | 0.0 | NRRP |
| R159 | राष्ट्रिय धान बाली अनुसन्धान केन्द्र, हर्दिनाथ | Rice | Hardinath Hybrid 3 | HS | 86 | 2 | 4 | 0 | 8 | 98.7 | 0.0 | 0.0 | 1.3 | 13.2 | Pink | Pink | Pink | Pink | 0.0 | NRRP |
| R160 | राष्ट्रिय बाली बिज्ञान अनुसन्धान केन्द्र, खुमलटार | Lentil | Maheshwori Bharati | FS | 89 | 1 | 4 | 0 | 6 | 99.6 | 0.0 | 0.0 | 0.4 | 9.5 | Blue | Pink | Pink | Pink | 16.2 | Station |
| R161 | बागबानी अनुसन्धान केन्द्र, जुम्ला | Mustard | Marpha Chaudapaat | FS | 54 | 0 | 30 | 0 | 16 | 98.0 | 0.0 | 0.0 | 2.0 | 9.5 | Blue | Pink | Pink | Pink | 3.6 | Station |

| Lab No. | Name and Address of Sender | Kind | Variety | Class | GERMINATION TEST (%) | | | | | PURITY TEST (%) | | | | MOISTURE TEST (%) | Hydrion paper condition | | | | 1000 SEED WEIGHT (gm) | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Germn | Abnor. | Fresh | Hard | Dead | Pure Seed | Other Crop seed | Weed Seed | Innert matter | | 3 months | 6 months | 9 months | 12 months | | |
| R162 | बागबानी अनुसन्धान केन्द्र, जुम्ला | Radish | Tokinasi | FS | 90 | 2 | 4 | 1 | 3 | 99.5 | 0.0 | 0.0 | 0.5 | 11.2 | Blue | Pink | Pink | Pink | 12.3 | Station |
| R163 | बागबानी अनुसन्धान केन्द्र, जुम्ला | Pea | Arkel | - | 91 | 4 | 1 | 2 | 2 | 100.0 | 0.0 | 0.0 | 0.0 | 10.8 | Blue | Blue | Pink | Pink | 184.2 | Station |
| R164 | हरियाली कृषि सहकारी संस्था लिमिटेड, सातदोबाटो | Mustard | Manakamana | IS | 70 | 4 | 14 | 0 | 12 | 99.2 | 0.0 | 0.0 | 0.8 | 9.5 | Blue | Blue | Blue | Pink | 3.1 | Agrovet |
| R165 | हरियाली कृषि सहकारी संस्था लिमिटेड, सातदोबाटो | Mustard | Khumal Chaudapat | IS | 78 | 10 | 2 | 0 | 10 | 99.9 | 0.0 | 0.0 | 0.1 | 9.6 | Blue | Blue | Blue | Pink | 2.9 | Agrovet |
| R166 | हरियाली कृषि सहकारी संस्था लिमिटेड, सातदोबाटो | Mustard | Khumal Rato | IS | 32 | 5 | 19 | 0 | 44 | 99.3 | 0.0 | 0.0 | 0.7 | 9.5 | Blue | Blue | Blue | Pink | 3.2 | Agrovet |
| R167 | हरियाली कृषि सहकारी संस्था लिमिटेड, सातदोबाटो | Mustard | Manakamana | IS | 70 | 4 | 16 | 0 | 10 | 98.6 | 0.0 | 0.0 | 1.4 | 9.4 | Blue | Blue | Blue | Pink | 3.1 | Agrovet |
| R168 | हरियाली कृषि सहकारी संस्था लिमिटेड, सातदोबाटो | Mustard | Khumal Chaudapat | IS | 77 | 9 | 3 | 0 | 11 | 100.0 | 0.0 | 0.0 | 0.0 | 10.5 | Blue | Blue | Blue | Pink | 3.1 | Agrovet |
| R169 | हरियाली कृषि सहकारी संस्था लिमिटेड, सातदोबाटो | Mustard | Khumal Rato | IS | 35 | 6 | 17 | 0 | 42 | 99.6 | 0.0 | 0.0 | 0.4 | 11.2 | Blue | Blue | Blue | Pink | 3.2 | Agrovet |
| R170 | राष्ट्रिय बाली प्रजनन् तथा आनुवंशिक अ. केन्द्र, खुमलटार | Soybean | Chaingmow | BS | 97 | 3 | 0 | 0 | 0 | 100.0 | 0.0 | 0.0 | 0.0 | 11.9 | Blue | Blue | Pink | Pink | 0.0 | Station |
| R171 | राष्ट्रिय बाली प्रजनन् तथा आनुवंशिक अ. केन्द्र, खुमलटार | Soybean | CN 60 | BS | 99 | 1 | 0 | 0 | 0 | 100.0 | 0.0 | 0.0 | 0.0 | 12.1 | Blue | Blue | Pink | Pink | 0.0 | Station |

| Lab No. | Name and Address of Sender | Kind | Variety | Class | GERMINATION TEST (%) | | | | | PURITY TEST (%) | | | | MOISTURE TEST (%) | Hydrion paper condition | | | | 1000 SEED WEIGHT (gm) | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Germn | Abnor. | Fresh | Hard | Dead | Pure Seed | Other Crop seed | Weed Seed | Innert matter | | 3 months | 6 months | 9 months | 12 months | | |
| R172 | राष्ट्रिय बाली प्रजनन् तथा आनुवंशिक अ. केन्द्र, खुमलटार | Soybean | G 4508 | BS | 99 | 1 | 0 | 0 | 0 | 100.0 | 0.0 | 0.0 | 0.0 | 11.5 | Blue | Blue | Pink | Pink | 0.0 | Station |
| R173 | राष्ट्रिय बाली प्रजनन् तथा आनुवंशिक अ. केन्द्र, खुमलटार | Soybean | CM 9133 | BS | 98 | 1 | 0 | 0 | 1 | 100.0 | 0.0 | 0.0 | 0.0 | 11.6 | Blue | Blue | Pink | Pink | 0.0 | Station |
| R174 | राष्ट्रिय बाली प्रजनन् तथा आनुवंशिक अ. केन्द्र, खुमलटार | Soybean | LS 77-16-16 | BS | 97 | 2 | 1 | 0 | 0 | 100.0 | 0.0 | 0.0 | 0.0 | 11.5 | Blue | Blue | Pink | Pink | 0.0 | Station |
| R175 | राष्ट्रिय बाली प्रजनन् तथा आनुवंशिक अ. केन्द्र, खुमलटार | Soybean | Coll#3 | BS | 98 | 2 | 0 | 0 | 0 | 100.0 | 0.0 | 0.0 | 0.0 | 11.5 | Blue | Blue | Pink | Pink | 0.0 | Station |
| R176 | हरियाली सा. बीउ बिजन कम्पनि प्रा.लि, काठमाडौं | घ्यू सिमि | Brown | IS | 98 | 2 | 0 | 0 | 0 | 99.9 | 0.0 | 0.0 | 0.1 | 9.5 | Blue | Blue | Pink | Pink | 319.4 | Agrovet |
| R177 | हरियाली सा. बीउ बिजन कम्पनि प्रा.लि, काठमाडौं | Bean | Black | IS | 97 | 2 | 0 | 0 | 1 | 100.0 | 0.0 | 0.0 | 0.0 | 9.5 | Blue | Blue | Pink | Pink | 224.4 | Agrovet |
| R178 | हरियाली सा. बीउ बिजन कम्पनि प्रा.लि, काठमाडौं | Radish | 40 days | IS | 92 | 2 | 1 | 0 | 5 | 99.9 | 0.0 | 0.0 | 0.1 | 8.1 | Blue | Blue | Pink | Pink | 12.5 | Agrovet |
| R179 | हरियाली सा. बीउ बिजन कम्पनि प्रा.लि, काठमाडौं | Cowpea | long linong HQNO | IS | 89 | 3 | 1 | 0 | 7 | 98.9 | 0.0 | 0.0 | 1.1 | 8.1 | Blue | Blue | Pink | Pink | 126.7 | Agrovet |
| R180 | हरियाली सा. बीउ बिजन कम्पनि प्रा.लि, काठमाडौं | Soybean | Tarkari | IS | 62 | 24 | 0 | 0 | 14 | 99.9 | 0.0 | 0.0 | 0.1 | 12.3 | Blue | Pink | Pink | Pink | 352.5 | Agrovet |

| Lab No. | Name and Address of Sender | Kind | Variety | Class | GERMINATION TEST (%) | | | | | PURITY TEST (%) | | | | MOISTURE TEST (%) | Hydrion paper condition | | | | 1000 SEED WEIGHT (gm) | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Germn | Abnor. | Fresh | Hard | Dead | Pure Seed | Other Crop seed | Weed Seed | Innert matter | | 3 months | 6 months | 9 months | 12 months | | |
| R181 | हरियाली सा. बीउ बिजन कम्पनि प्रा.लि, काठमाडौं | Kidney Bean | Rato | IS | 98 | 1 | 0 | 0 | 1 | 99.6 | 0.0 | 0.0 | 0.4 | 10.2 | Blue | Blue | Pink | Pink | 381.1 | Agrovet |
| R182 | हरियाली सा. बीउ बिजन कम्पनि प्रा.लि, काठमाडौं | Bean | Kaju bean | IS | 99 | 1 | 0 | 0 | 0 | 99.4 | 0.0 | 0.0 | 0.6 | 8.4 | Blue | Blue | Blue | Pink | 354.7 | Agrovet |
| R183 | हरियाली सा. बीउ बिजन कम्पनि प्रा.लि, काठमाडौं | Mustard | Khumal Chaudapat | IS | 78 | 2 | 9 | 0 | 11 | 13.3 | 0.0 | 0.0 | 0.0 | 9.6 | Blue | Blue | Pink | Pink | 2.2 | Agrovet |
| R184 | हरियाली सा. बीउ बिजन कम्पनि प्रा.लि, काठमाडौं | Mustard | Marpha Chaudapaat | IS | 67 | 0 | 0 | 0 | 33 | 99.8 | 0.0 | 0.0 | 0.2 | 9.9 | Blue | Blue | Pink | Pink | 1.2 | Agrovet |
| R185 | हरियाली सा. बीउ बिजन कम्पनि प्रा.लि, काठमाडौं | Radish | Gante | IS | 19 | 7 | 41 | 0 | 33 | 99.9 | 0.0 | 0.0 | 0.1 | 7.9 | Blue | Blue | Blue | Pink | 2.4 | Agrovet |
| R186 | हरियाली सा. बीउ बिजन कम्पनि प्रा.लि, काठमाडौं | Mustard | Chitwan local | IS | 18 | 5 | 0 | 0 | 77 | 99.9 | 0.1 | 0.0 | 0.0 | 9.9 | Blue | Blue | Pink | Pink | 3.5 | Agrovet |
| R187 | हरियाली सा. बीउ बिजन कम्पनि प्रा.लि, काठमाडौं | Soybean | Black, local | IS | 95 | 2 | 0 | 0 | 3 | 99.9 | 0.0 | 0.0 | 0.1 | 12.1 | Blue | Blue | Pink | Pink | 206.5 | Agrovet |
| R188 | हरियाली सा. बीउ बिजन कम्पनि प्रा.लि, काठमाडौं | Soybean | White, local | IS | 79 | 5 | 1 | 0 | 15 | 100.0 | 0.0 | 0.0 | 0.0 | 12.1 | Blue | Blue | Pink | Pink | 172.8 | Agrovet |
| R189 | हरियाली सा. बीउ बिजन कम्पनि प्रा.लि, काठमाडौं | Soybean | Brown, local | IS | 81 | 10 | 0 | 0 | 9 | 99.6 | 0.0 | 0.0 | 0.4 | 12.1 | Blue | Blue | Pink | Pink | 200.6 | Agrovet |
| R190 | Farmer- Kanchi Maharjan, Harisiddhi 28 | Soybean | Brown, local | IS | 90 | 5 | 0 | 0 | 5 | 96.5 | 3.4 | 0.0 | 0.0 | 12.2 | Blue | Blue | Pink | Pink | 225.5 | Farmer |
| R191 | Farmer- Kanchi Maharjan, Harisiddhi 28 | Soybean | Tarkari | IS | 93 | 7 | 0 | 0 | o | 100.0 | 0.0 | 0.0 | 0.0 | 11.5 | Blue | Blue | Blue | Pink | 211.3 | Farmer |
| R192 | Farmer- Kanchi Maharjan, Harisiddhi 28 | Soybean | Brown | IS | 99 | 0 | 0 | 0 | 1 | 98.9 | 0.0 | 0.0 | 1.1 | 11.5 | Blue | Blue | Blue | Pink | 177.7 | Farmer |

| Lab No. | Name and Address of Sender | Kind | Variety | Class | GERMINATION TEST (%) | | | | | PURITY TEST (%) | | | | MOISTURE TEST (%) | Hydrion paper condition | | | | 1000 SEED WEIGHT (gm) | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Germn | Abnor. | Fresh | Hard | Dead | Pure Seed | Other Crop seed | Weed Seed | Innert matter | | 3 months | 6 months | 9 months | 12 months | | |
| R193 | Farmer- Kanchi Maharjan, Harisiddhi 28 | Pea | Big, local | IS | 41 | 4 | 0 | 0 | 5 | 93.9 | 5.5 | 0.0 | 0.6 | 9.8 | Blue | Blue | Pink | Pink | 179.4 | Farmer |
| R194 | Farmer- Kanchi Maharjan, Harisiddhi 28 | Pea | Green pea | IS | 79 | 7 | 0 | 0 | 14 | 97.4 | 0.0 | 0.0 | 2.6 | 9.2 | Blue | Blue | Pink | Pink | 235.3 | Farmer |
| R195 | Farmer- Kanchi Maharjan, Harisiddhi 28 | Lentil | local | IS | 73 | 5 | 0 | 0 | 22 | 97.8 | 0.0 | 0.0 | 2.2 | 10.5 | Blue | Blue | Pink | Pink | 14.6 | Farmer |
| R196 | Farmer- Kanchi Maharjan, Harisiddhi 28 | Black gram | local | IS | 64 | 1 | 0 | 0 | 35 | 100.0 | 0.0 | 0.0 | 0.0 | 12.6 | Blue | Pink | Pink | Pink | 48.8 | Farmer |
| R197 | Farmer- Kanchi Maharjan, Harisiddhi 28 | Pea | Small pea, local | IS | 99 | 0 | 0 | 0 | 1 | 99.5 | 0.0 | 0.0 | 0.5 | 9.6 | Blue | Blue | Pink | Pink | 78.8 | Farmer |
| R198 | Farmer- Kanchi Maharjan, Harisiddhi 28 | बकुला सिमि | New | IS | 92 | 6 | 0 | 0 | 2 | 99.8 | 0.0 | 0.0 | 0.2 | 13.1 | Pink | Pink | Pink | Pink | 763.9 | Farmer |
| R199 | Farmer- Kanchi Maharjan, Harisiddhi 28 | बकुला सिमि | Old | IS | 89 | 5 | 0 | 0 | 6 | 98.9 | 0.0 | 0.0 | 1.1 | 13.5 | Pink | Pink | Pink | Pink | 699.4 | Farmer |
| R200 | Farmer- Kanchi Maharjan, Harisiddhi 28 | Lentil | local | IS | 58 | 0 | 0 | 0 | 42 | 99.7 | 0.0 | 0.0 | 0.3 | 12.5 | Pink | Pink | Pink | Pink | 16.4 | Farmer |
| R201 | Farmer- Kanchi Maharjan, Harisiddhi 28 | Chickpea | local | IS | 84 | 7 | 0 | 0 | 9 | 98.8 | 0.0 | 0.0 | 1.2 | 8.2 | Blue | Blue | Blue | Blue | 217.1 | Farmer |
| R202 | Farmer- Kanchi Maharjan, Harisiddhi 28 | Mustard | Big, local | IS | 95 | 2 | 0 | 0 | 3 | 99.9 | 0.0 | 0.0 | 0.1 | 8.5 | Blue | Blue | Blue | Pink | 3.3 | Farmer |
| R203 | Farmer- Kanchi Maharjan, Harisiddhi 28 | Mustard | local | IS | 95 | 0 | 0 | 0 | 5 | 98.8 | 0.0 | 0.0 | 1.2 | 8.5 | Blue | Blue | Blue | Pink | 2.3 | Farmer |
| R204 | Farmer- Bhuwan Thapa, Sanogaun, Lalitpur | Mustard | Pragati | IS | 90 | 2 | 5 | 0 | 3 | 99.1 | 0.0 | 0.0 | 0.9 | 8.5 | Blue | Blue | Blue | Pink | 3.2 | Farmer |
| R205 | Farmer- Bhim Maharjan, Sanogaun, Lalitpur | Mustard | local Old | IS | 0 | 0 | 0 | 0 | 100 | 97.5 | 0.0 | 0.0 | 2.5 | 11.2 | Blue | Blue | Pink | Pink | 2.6 | Farmer |
| R206 | Farmer- Prativa Maharjan, Sanogaun, Lalitpur | Mustard | Bal tori | IS | 97 | 0 | 0 | 0 | 3 | 98.6 | 0.0 | 0.0 | 1.4 | 8.5 | Blue | Blue | Blue | Pink | 2.1 | Farmer |
| R207 | Farmer- Prativa Maharjan, Sanogaun, Lalitpur | Lentil | local | IS | 39 | 1 | 5 | 0 | 55 | 90.7 | 9.3 | 0.0 | 0.0 | 11.6 | Blue | Blue | Pink | Pink | 18.7 | Farmer |

| Lab No. | Name and Address of Sender | Kind | Variety | Class | GERMINATION TEST (%) | | | | | PURITY TEST (%) | | | | MOISTURE TEST (%) | Hydrion paper condition | | | | 1000 SEED WEIGHT (gm) | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Germn | Abnor. | Fresh | Hard | Dead | Pure Seed | Other Crop seed | Weed Seed | Innert matter | | 3 months | 6 months | 9 months | 12 months | | |
| R208 | Farmer- Prativa Maharjan, Sanogaun, Lalitpur | Pea | Small pea, local | IS | 41 | 9 | 0 | 0 | 50 | 99.9 | 0.0 | 0.0 | 0.1 | 9.1 | Blue | Blue | Pink | Pink | 80.5 | Farmer |
| R209 | Farmer- Prativa Maharjan, Sanogaun, Lalitpur | Pea | Green pea, Big | IS | 85 | 3 | 0 | 0 | 12 | 97.7 | 0.0 | 0.0 | 2.3 | 8.6 | Blue | Blue | Pink | Pink | 237.6 | Farmer |
| R210 | Farmer- Prativa Maharjan, Sanogaun, Lalitpur | Bean | White bean | IS | 45 | 10 | 0 | 0 | 45 | 100.0 | 0.0 | 0.0 | 0.0 | 8 | Blue | Blue | Blue | Pink | 197.8 | Farmer |
| R211 | Farmer- Prativa Maharjan, Sanogaun, Lalitpur | Pea | Big pea, local | IS | 88 | 6 | 1 | 0 | 5 | 93.5 | 0.0 | 0.0 | 6.5 | 8.7 | Blue | Blue | Pink | Pink | 176.7 | Farmer |
| R212 | Farmer- Prativa Maharjan, Sanogaun, Lalitpur | Pea | small pea, local, old | IS | 98 | 1 | 0 | 0 | 1 | 97.8 | 1.1 | 0.4 | 0.7 | 8.8 | Blue | Blue | Pink | Pink | 78.7 | Farmer |
| R213 | Farmer- Bhuwan Thapa, Sanogaun, Lalitpur | Mustard | Pragati | IS | 98 | 1 | 0 | 0 | 1 | 98.5 | 0.0 | 0.0 | 1.5 | 8.4 | Blue | Blue | Blue | Pink | 2.6 | Farmer |
| R214 | Farmer- Bhim Maharjan, Sanogaun, Lalitpur | Mustard | local | IS | 6 | 5 | 19 | 0 | 70 | 99.5 | 0.0 | 0.0 | 0.5 | 9.6 | Blue | Blue | Pink | Pink | 3.7 | Farmer |
| R215 | ATC Scientific B.C. Centre, Khumaltar | Cowpea | Helinang | IS | 20 | 0 | 0 | 0 | 80 | 99.9 | 0.0 | 0.0 | 0.1 | 9.2 | Blue | Blue | Pink | Pink | 154.1 | Agrovet |
| R216 | ATC Scientific B.C. Centre, Khumaltar | Bean long | long linong HQNO | IS | 94 | 2 | 0 | 0 | 4 | 99.5 | 0.0 | 0.1 | 0.4 | 8.2 | Blue | Blue | Blue | Pink | 133.0 | Agrovet |
| R217 | ATC Scientific B.C. Centre, Khumaltar | White pearl bean | White pea bean local | IS | 98 | 2 | 0 | 0 | 0 | 100.0 | 0.0 | 0.0 | 0.0 | 9.5 | Blue | Blue | Pink | Pink | 209.4 | Agrovet |
| R218 | ATC Scientific B.C. Centre, Khumaltar | Kidney Bean | local | IS | 99 | 0 | 0 | 0 | 1 | 100.0 | 0.0 | 0.0 | 0.0 | 10 | Blue | Blue | Pink | Pink | 396.7 | Agrovet |
| R219 | ATC Scientific B.C. Centre, Khumaltar | Soybean | Chinese | IS | 0 | 0 | 0 | 0 | 100 | 99.6 | 0.0 | 0.0 | 0.4 | 12.1 | Blue | Pink | Pink | Pink | 339.3 | Agrovet |
| R220 | ATC Scientific B.C. Centre, Khumaltar | Soybean | local | IS | 33 | 1 | 0 | 0 | 66 | 96.3 | 0.7 | 0.0 | 3.0 | 12.1 | Blue | Pink | Pink | Pink | 168.2 | Agrovet |
| R221 | ATC Scientific B.C. Centre, Khumaltar | French bean | - | IS | 77 | 10 | 0 | 0 | 13 | 100.0 | 0.0 | 0.0 | 0.0 | 10.2 | Blue | Blue | Pink | Pink | 187.8 | Agrovet |
| R222 | ATC Scientific B.C. Centre, Khumaltar | Kidney Bean | - | IS | 95 | 4 | 0 | 0 | 1 | 99.9 | 0.0 | 0.0 | 0.1 | 10.2 | Blue | Blue | Pink | Pink | 328.5 | Agrovet |

| Lab No. | Name and Address of Sender | Kind | Variety | Class | GERMINATION TEST (%) | | | | | PURITY TEST (%) | | | | MOISTURE TEST (%) | Hydrion paper condition | | | | 1000 SEED WEIGHT (gm) | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Germn | Abnor. | Fresh | Hard | Dead | Pure Seed | Other Crop seed | Weed Seed | Innert matter | | 3 months | 6 months | 9 months | 12 months | | |
| R223 | ATC Scientific B.C. Centre, Khumaltar | Mustard | - | IS | 91 | 5 | 0 | 0 | 4 | 99.7 | 0.0 | 0.0 | 0.3 | 8.6 | Blue | Blue | Blue | Pink | 3.7 | Agrovet |
| R224 | ATC Scientific B.C. Centre, Khumaltar | Mustard | Japanese mustard 101 | IS | 89 | 2 | 8 | 0 | 1 | 100.0 | 0.0 | 0.0 | 0.0 | 8.6 | Blue | Blue | Blue | Pink | 2.0 | Agrovet |
| R225 | ATC Scientific B.C. Centre, Khumaltar | Mustard | Manakamana | IS | 51 | 3 | 35 | 0 | 11 | 99.9 | 0.0 | 0.0 | 0.1 | 9.5 | Blue | Blue | Pink | Pink | 1.6 | Agrovet |
| R226 | ATC Scientific B.C. Centre, Khumaltar | Mustard | Khumal Chaudapat | IS | 2 | 1 | 27 | 0 | 70 | 100.0 | 0.0 | 0.0 | 0.0 | 9.5 | Blue | Blue | Pink | Pink | 1.6 | Agrovet |
| R227 | ATC Scientific B.C. Centre, Khumaltar | Mustard | Marpha Chaudapaat | IS | 36 | 4 | 33 | 0 | 27 | 99.9 | 0.0 | 0.0 | 0.1 | 10.1 | Blue | Pink | Pink | Pink | 1.2 | Agrovet |
| R228 | ATC Scientific B.C. Centre, Khumaltar | Mustard | Mustard prava | IS | 16 | 19 | 56 | 0 | 9 | 100.0 | 0.0 | 0.0 | 0.0 | 10.5 | Blue | Pink | Pink | Pink | 2.1 | Agrovet |
| R229 | ATC Scientific B.C. Centre, Khumaltar | Mustard | Leaf mustard | IS | 68 | 1 | 13 | 0 | 18 | 99.8 | 0.0 | 0.0 | 0.2 | 10.6 | Blue | Pink | Pink | Pink | 2.3 | Agrovet |
| R230 | ATC Scientific B.C. Centre, Khumaltar | Spinach | Green Crown Pakchoy | IS | 99 | 0 | 0 | 0 | 1 | 100.0 | 0.0 | 0.0 | 0.0 | 9.2 | Blue | Blue | Pink | Pink | 2.4 | Agrovet |
| R231 | ATC Scientific B.C. Centre, Khumaltar | Mustard | Choysum - dwaft 45 days | IS | 90 | 1 | 4 | 0 | 5 | 99.3 | 0.0 | 0.0 | 0.7 | 9.8 | Blue | Pink | Pink | Pink | 2.7 | Agrovet |
| R232 | NSSTRC, Khumaltar | Soybean | Black | IS | 96 | 0 | 3 | 0 | 1 | 99.5 | 0.1 | 0.0 | 0.5 | 12.1 | Blue | Pink | Pink | Pink | 130.9 | Station |
| R233 | Farmer- Chirimaya Maharjan, Thaiba | Sunflower | Big, black | | 10 | 0 | 0 | 0 | 90 | 99.3 | 0.3 | 0.0 | 0.4 | 10 | Blue | Pink | Pink | Pink | 58.3 | Farmer |
| R234 | Farmer- Chirimaya Maharjan, Thaiba | Sunflower | Small, off white | | 16 | 0 | 0 | 0 | 84 | 97.9 | 1.2 | 0.0 | 0.9 | 10.2 | Blue | Pink | Pink | Pink | 37.7 | Farmer |
| R235 | Farmer- Chirimaya Maharjan, Thaiba | Mustard | Marpha | | 94 | 0 | 0 | 0 | 6 | 99.7 | 0.0 | 0.0 | 0.3 | 8.6 | Blue | Blue | Pink | Pink | 1.3 | Farmer |
| R236 | Farmer- Chirimaya Maharjan, Thaiba | Bean | Chaumase, black | | 89 | 4 | 0 | 0 | 7 | 100.0 | 0.0 | 0.0 | 0.0 | 8 | Blue | Blue | Blue | Pink | 246.1 | Farmer |
| R237 | Everest Seed Company, Khumaltar | Mustard | Manakamana | | 39 | 2 | 0 | 59 | 0 | 99.9 | 0.0 | 0.0 | 0.1 | 9.9 | Blue | Blue | Pink | Pink | 1.5 | Agrovet |

| Lab No. | Name and Address of Sender | Kind | Variety | Class | GERMINATION TEST (%) | | | | | PURITY TEST (%) | | | | MOISTURE TEST (%) | Hydrion paper condition | | | | 1000 SEED WEIGHT (gm) | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Germn | Abnor. | Fresh | Hard | Dead | Pure Seed | Other Crop seed | Weed Seed | Innert matter | | 3 months | 6 months | 9 months | 12 months | | |
| R238 | Everest Seed Company, Khumaltar | Mustard | Khumal Chaudapat | | 30 | 20 | 17 | 0 | 33 | 100.0 | 0.0 | 0.0 | 0.0 | 10.5 | Blue | Pink | Pink | Pink | 1.4 | Agrovet |
| R239 | Everest Seed Company, Khumaltar | Radish | Gante mula | | 99 | 0 | 0 | 0 | 1 | 99.0 | 0.0 | 0.0 | 1.0 | 8 | Blue | Blue | Blue | Pink | 2.1 | Agrovet |
| R240 | Everest Seed Company, Khumaltar | Mustard | Khumal chaudapat, old | | 36 | 10 | 28 | 0 | 26 | 99.9 | 0.0 | 0.0 | 0.1 | 10.9 | Blue | Pink | Pink | Pink | 1.4 | Agrovet |
| R241 | Everest Seed Company, Khumaltar | Turnip | Purple top | | 2 | 4 | 9 | 0 | 85 | 98.5 | 0.0 | 0.0 | 1.5 | 8.2 | Blue | Blue | Pink | Pink | 2.0 | Agrovet |
| R242 | Everest Seed Company, Khumaltar | Radish | Mino Early | | 95 | 1 | 0 | 0 | 4 | 99.8 | 0.0 | 0.0 | 0.2 | 8.4 | Blue | Blue | Blue | Pink | 14.6 | Agrovet |
| R243 | Everest Seed Company, Khumaltar | Radish | 40 days | | 98 | 0 | 0 | 0 | 2 | 99.8 | 0.0 | 0.0 | 0.2 | 8.5 | Blue | Blue | Blue | Pink | 14.2 | Agrovet |
| R244 | Everest Seed Company, Khumaltar | Radish | local | | 89 | 5 | 0 | 0 | 6 | 99.9 | 0.0 | 0.0 | 0.1 | 8.5 | Blue | Blue | Blue | Pink | 14.5 | Agrovet |
| R245 | Everest Seed Company, Khumaltar | Mustard | local | | 80 | 11 | 0 | 0 | 9 | 99.9 | 0.0 | 0.0 | 0.1 | 9.5 | Blue | Blue | Pink | Pink | 3.9 | Agrovet |
| R246 | Everest Seed Company, Khumaltar | Soybean | Sathiya, Brown | | 93 | 3 | 0 | 0 | 4 | 100.0 | 0.0 | 0.0 | 0.0 | 12.3 | Pink | Pink | Pink | Pink | 179.2 | Agrovet |
| R247 | Everest Seed Company, Khumaltar | Soybean | Sathiya, Black | | 85 | 7 | 0 | 0 | 8 | 100.0 | 0.0 | 0.0 | 0.0 | 11.5 | Blue | Pink | Pink | Pink | 224.7 | Agrovet |
| R248 | Everest Seed Company, Khumaltar | Soybean | Brown, local | | 87 | 5 | 0 | 0 | 8 | 100.0 | 0.0 | 0.0 | 0.0 | 11.6 | Blue | Pink | Pink | Pink | 171.5 | Agrovet |
| R249 | Everest Seed Company, Khumaltar | घ्यू सिमि | घ्यू सिमि | | 100 | 0 | 0 | 0 | 0 | 100.0 | 0.0 | 0.0 | 0.0 | 11.5 | Blue | Pink | Pink | Pink | 331.3 | Agrovet |
| R250 | Everest Seed Company, Khumaltar | Bean | longbean, meiwujia | | 76 | 14 | 0 | 0 | 10 | 99.6 | 0.0 | 0.0 | 0.4 | 11 | Blue | Blue | Pink | Pink | 143.6 | Agrovet |
| R251 | Everest Seed Company, Khumaltar | Bean | Kaju bean | | 100 | 0 | 0 | 0 | 0 | 98.9 | 0.0 | 0.0 | 1.1 | 7.9 | Blue | Blue | Blue | Pink | 338.5 | Agrovet |
| R252 | Everest Seed Company, Khumaltar | Cowpea | Double harvest, LG | | 96 | 0 | 4 | 0 | 0 | 100.0 | 0.0 | 0.0 | 0.0 | 8.9 | Blue | Blue | Blue | Pink | 102.8 | Agrovet |

| Lab No. | Name and Address of Sender | Kind | Variety | Class | GERMINATION TEST (%) | | | | | PURITY TEST (%) | | | | MOISTURE TEST (%) | Hydrion paper condition | | | | 1000 SEED WEIGHT (gm) | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Germn | Abnor. | Fresh | Hard | Dead | Pure Seed | Other Crop seed | Weed Seed | Innert matter | | 3 months | 6 months | 9 months | 12 months | | |
| R253 | Everest Seed Company, Khumaltar | Soybean | Tarkari | | 67 | 15 | 0 | 0 | 18 | 96.0 | 0.0 | 0.0 | 4.0 | 11.6 | Blue | Blue | Pink | Pink | 358.1 | Agrovet |
| R254 | Everest Seed Company, Khumaltar | Bean | Chaumase, black | | 88 | 6 | 0 | 0 | 6 | 100.0 | 0.0 | 0.0 | 0.0 | 8.5 | Blue | Blue | Blue | Pink | 236.3 | Agrovet |
| R255 | Everest Seed Company, Khumaltar | Kidney Bean | - | | 99 | 0 | 0 | 0 | 1 | 100.0 | 0.0 | 0.0 | 0.0 | 10.8 | Blue | Blue | Pink | Pink | 388.3 | Agrovet |
| R256 | Everest Seed Company, Khumaltar | Pea | Green pea | | 78 | 7 | 0 | 0 | 15 | 100.0 | 0.0 | 0.0 | 0.0 | 10.5 | Blue | Blue | Pink | Pink | 175.7 | Agrovet |
| R257 | Everest Seed Company, Khumaltar | Cowpea | Nepali bodi | | 88 | 7 | 0 | 0 | 5 | 100.0 | 0.0 | 0.0 | 0.0 | 8.8 | Blue | Blue | Pink | Pink | 102.9 | Agrovet |
| R258 | Farmer- Shyam Shrestha, Thaiba | Pea | Green pea | | 98 | 0 | 0 | 0 | 2 | 99.2 | 0.0 | 0.0 | 0.8 | 10.6 | Blue | Blue | Pink | Pink | 210.1 | Farmer |
| R259 | Farmer- Shyam Shrestha, Thaiba | Flax seed | mix | | 90 | 2 | 0 | 0 | 8 | 39.0 | 56.3 | 0.0 | 4.6 | 9.9 | Blue | Blue | Pink | Pink | 4.8 | Farmer |
| R260 | Farmer- Shyam Shrestha, Thaiba | Mustard | Khumal Chaudapat | | 80 | 5 | 2 | 0 | 13 | 99.9 | 0.0 | 0.0 | 0.1 | 9.4 | Blue | Blue | Pink | Pink | 1.6 | Farmer |
| R261 | Mount Agrovet, Kalimati | Pea | Arkel, Green pea | | 92 | 2 | 0 | 0 | 6 | 100.0 | 0.0 | 0.0 | 0.0 | 10.8 | Blue | Blue | Pink | Pink | 174.0 | Agrovet |
| R262 | Mount Agrovet, Kalimati | Soybean | Brown, local | | 95 | 4 | 1 | 0 | 0 | 99.9 | 0.0 | 0.0 | 0.1 | 12.1 | Blue | Blue | Pink | Pink | 166.6 | Agrovet |
| R263 | Mount Agrovet, Kalimati | घ्यू सिमि | घ्यू सिमि | | 90 | 5 | 2 | 0 | 3 | 99.8 | 0.0 | 0.0 | 0.2 | 12.1 | Blue | Blue | Pink | Pink | 287.6 | Agrovet |
| R264 | Mount Agrovet, Kalimati | Kidney Bean | - | | 98 | 0 | 1 | 0 | 1 | 99.8 | 0.0 | 0.0 | 0.2 | 10.1 | Blue | Blue | Pink | Pink | 385.8 | Agrovet |
| R265 | Mount Agrovet, Kalimati | Bean | Kaju bean | | 99 | 0 | 0 | 0 | 1 | 99.9 | 0.0 | 0.0 | 0.1 | 8.1 | Blue | Blue | Blue | Pink | 371.0 | Agrovet |
| R266 | Mount Agrovet, Kalimati | Bean | Black bean | | 76 | 9 | 2 | 0 | 13 | 99.9 | 0.0 | 0.0 | 0.1 | 9.2 | Blue | Blue | Pink | Pink | 282.5 | Agrovet |
| R267 | Mount Agrovet, Kalimati | Soybean | Black, local | | 64 | 16 | 0 | 0 | 20 | 99.6 | 0.0 | 0.0 | 0.4 | 12.6 | Blue | Pink | Pink | Pink | 241.1 | Agrovet |
| R268 | Mount Agrovet, Kalimati | Soybean | White, local, big | | 83 | 5 | 0 | 0 | 12 | 99.5 | 0.0 | 0.0 | 0.5 | 12.5 | Blue | Pink | Pink | Pink | 314.3 | Agrovet |
| R269 | Mount Agrovet, Kalimati | Radish | Gante mula | | 77 | 6 | 2 | 0 | 15 | 99.5 | 0.0 | 0.0 | 0.5 | 8.1 | Blue | Blue | Blue | Pink | 2.1 | Agrovet |
| R270 | Mount Agrovet, Kalimati | Mustard | Tori | | 91 | 3 | 0 | 6 | 0 | 99.3 | 0.0 | 0.0 | 0.7 | 8.9 | Blue | Pink | Pink | Pink | 3.8 | Agrovet |
| R271 | Mount Agrovet, Kalimati | Mustard | Rayo | | 8 | 1 | 53 | 0 | 38 | 99.9 | 0.0 | 0.0 | 0.1 | 9.9 | Blue | Pink | Pink | Pink | 1.5 | Agrovet |

| Lab No. | Name and Address of Sender | Kind | Variety | Class | GERMINATION TEST (%) | | | | | PURITY TEST (%) | | | | MOISTURE TEST (%) | Hydrion paper condition | | | | 1000 SEED WEIGHT (gm) | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Germn | Abnor. | Fresh | Hard | Dead | Pure Seed | Other Crop seed | Weed Seed | Innert matter | | 3 months | 6 months | 9 months | 12 months | | |
| R272 | Mount Agrovet, Kalimati | Pea | Arkel, Green pea | | 51 | 9 | 0 | 0 | 40 | 100.0 | 0.0 | 0.0 | 0.0 | 10.6 | Blue | Pink | Pink | Pink | 184.7 | Agrovet |
| R273 | National Seed Agrovet, Lagenkhel | Kidney Bean | - | | 98 | 1 | 0 | 0 | 1 | 99.8 | 0.0 | 0.0 | 0.2 | 10.1 | Blue | Blue | Pink | Pink | 395.2 | Agrovet |
| R274 | National Seed Agrovet, Lagenkhel | Bean | Kaju bean | | 98 | 2 | 0 | 0 | 0 | 99.8 | 0.0 | 0.0 | 0.2 | 8.3 | Blue | Blue | Blue | Pink | 355.1 | Agrovet |
| R275 | National Seed Agrovet, Lagenkhel | Soybean | Black, local | | 98 | 2 | 0 | 0 | 0 | 100.0 | 0.0 | 0.0 | 0.0 | 12.1 | Blue | Blue | Pink | Pink | 199.2 | Agrovet |
| R276 | National Seed Agrovet, Lagenkhel | Bean | Black bean | | 100 | 0 | 0 | 0 | 0 | 100.0 | 0.0 | 0.0 | 0.0 | 8 | Blue | Blue | Blue | Pink | 229.9 | Agrovet |
| R277 | National Seed Agrovet, Lagenkhel | Soybean | Chinese soybean | | 19 | 38 | 0 | 0 | 43 | 99.3 | 0.0 | 0.0 | 0.7 | 12.6 | Blue | Blue | Pink | Pink | 350.6 | Agrovet |
| R278 | National Seed Agrovet, Lagenkhel | Cowpea | - | | 89 | 5 | 0 | 0 | 6 | 99.8 | 0.0 | 0.0 | 0.2 | 8.9 | Blue | Blue | Blue | Pink | 140.2 | Agrovet |
| R279 | National Seed Agrovet, Lagenkhel | Mustard | Khumal rayo | | 8 | 0 | 58 | 0 | 34 | 100.0 | 0.0 | 0.0 | 0.0 | 10.1 | Blue | Blue | Pink | Pink | 1.7 | Agrovet |
| R280 | National Seed Agrovet, Lagenkhel | Turnip | - | | 78 | 12 | 2 | 0 | 8 | 99.6 | 0.0 | 0.0 | 0.4 | 7.9 | Blue | Blue | Blue | Blue | 2.1 | Agrovet |
| R281 | National Seed Agrovet, Lagenkhel | Mustard | Tori | | 94 | 2 | 0 | 0 | 4 | 99.1 | 0.0 | 0.0 | 0.9 | 8.5 | Blue | Blue | Blue | Pink | 3.6 | Agrovet |
| R282 | National Seed Agrovet, Lagenkhel | Radish | 40 days (A) | TL | 95 | 1 | 1 | 0 | 3 | 98.8 | 0.0 | 0.0 | 1.2 | 8.5 | Blue | Blue | Blue | Pink | 14.6 | Agrovet |
| R283 | National Seed Agrovet, Lagenkhel | Radish | 40 days (B) | TL | 96 | 1 | 2 | 0 | 1 | 99.8 | 0.0 | 0.0 | 0.2 | 8.5 | Blue | Blue | Blue | Pink | 13.5 | Agrovet |
| R284 | NSSTRC, Khumaltar | Mustard | Black tori | | 78 | 2 | 0 | 0 | 20 | 99.7 | 0.0 | 0.0 | 0.3 | 8.5 | Blue | Blue | Blue | Blue | 3.6 | NSSTRC |

***Note:*** *DoLS=Department of Livestock Services, JJGBFPPNU=Jana Jyoti Ghas Bue Falfull Pashu Palan Nursary Udyog, NSPC=Nepal Seed Production Center, DCDC=Dalchoki Community Development Committee, NWRP=National Wheat Research Programme, PKF=Pramila Krishi Farm, HRS=Horticulture Research Station, SKTPS& IPI=Shree Kalinchowk TPS & Improved Seed Production Industry, SKSS Ltd.=Siddhi Krishi Sahakari Sanstha Limited, NKSPSS Ltd=Naldhunga Krishi and Seed Production Sahakari Sanstha Limited, ARS=Agricultural Research Station, SQCC=Seed Quality Control Centre, RS=Ranjitpur Sample, Nepalgunj sample, PS=Proficiency Sample, BS=Breeder Seed, SKSS Ltd= Siddhi Krishi Sahakari Sanstha Limited, Bhaktapur, FS=Foundation Seed, CS=Certified Seed, IS=Improved Seed, HS=Hybrid Seed. Blue = Standard, Pink= Below standard.*

**Annex 13. नियमित तर्फको बार्षिक बजेट र खर्चको विवरण आ.ब.२०७९/८० (२०२२/२३)**

**चालु खर्च बजेट खर्च उप शिर्षक: २४११०१३**

राष्ट्रिय बिउ बिजान प्रबिधि अनुसन्धान केन्द्र, खुमलटार, ललितपुर

कार्यालय कोड नं.: ३१५४८५४१५

दातृ निकायगत बजेट र खर्चको आर्थिक विवरण

२०७९/८० साल

म. ले. प. फा. नं. २१४

बजेट मुल शीर्षक नं : कृषि अनुसन्धान कार्यक्रम[३१२४११०१३]
कार्यालय / आयोजनाको नाम :
आयोजना रहेको स्थान :

| खर्च संकेत | | स्रोतको तह | | | | | | संशोधन /रकमान्तर/श्रोतान्तर बाट | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| नम्बर | नाम | प्राथमिक | द्वितीय | स्रोत म्योहर्ने निकाय | प्रकार | भुक्तानी विधि | शुरु बजेट | थप | घट | अन्तिम बजेट | निकासा | जम्मा खर्च | बाँकी बजेट | गत वर्षको खर्च |
| २११११ | पारिश्रमिक कर्मचारी | नेपाल सरकार | | | नगद | | ६,२७६,०००.०० | ७३०,०००.०० | २५०,०००.०० | ६,७५६,०००.०० | ६,१९५,०७१.२० | ६,१९५,०७१.२० | ५६०,९२८.८० | |
| २११२१ | पोशाक | नेपाल सरकार | | | नगद | | १००,०००.०० | ०.०० | ०.०० | १००,०००.०० | ९०,०००.०० | ९०,०००.०० | १०,०००.०० | |
| २११३२ | महंगी भत्ता | नेपाल सरकार | | | नगद | | २४०,०००.०० | ०.०० | ०.०० | २४०,०००.०० | २२२,०००.०० | २२२,०००.०० | १८,०००.०० | |
| २१२१३ | योगदानमा आधारित बीमा कोष खर्च | नेपाल सरकार | | | नगद | | ४८,०००.०० | ०.०० | ०.०० | ४८,०००.०० | ४४,४००.०० | ४४,४००.०० | ३,६००.०० | |
| २२१११ | पानी तथा बिजुली | नेपाल सरकार | | | नगद | | १००,०००.०० | ०.०० | ०.०० | १००,०००.०० | ३४,८६४.०५ | ३४,८६४.०५ | ६५,१३५.९५ | |
| २२११२ | संचार महसुल | नेपाल सरकार | | | नगद | | ८८,०००.०० | ०.०० | ०.०० | ८८,०००.०० | ८१,८५५.०० | ८१,८५५.०० | ६,१४५.०० | |
| २२२१२ | इन्धन (कार्यालय प्रयोजन) | नेपाल सरकार | | | नगद | | ९३०,०००.०० | ०.०० | ०.०० | ९३०,०००.०० | ८५०,९७८.२५ | ८५०,९७८.२५ | ७९,०२१.७५ | |
| २२२१३ | सवारी साधन मर्मत खर्च | नेपाल सरकार | | | नगद | | ४३०,०००.०० | ०.०० | ०.०० | ४३०,०००.०० | ३८६,५८७.५५ | ३८६,५८७.५५ | ४३,४१२.४५ | |
| २२२१४ | बिमा तथा नवीकरण खर्च | नेपाल सरकार | | | नगद | | ७०,०००.०० | ०.०० | ०.०० | ७०,०००.०० | ७०,०००.०० | ७०,०००.०० | ०.०० | |
| २२२२१ | मेशिनरी तथा औजार मर्मत सम्भार तथा सञ्चालन खर्च | नेपाल सरकार | | | नगद | | २६०,०००.०० | ०.०० | ०.०० | २६०,०००.०० | २२२,८३६.६१ | २२२,८३६.६१ | ३७,१६३.३९ | |

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सुपेती

प्रमुख

खर्च संकेत

संशोधन /रकमान्तर/श्रोतान्तर बाट

| नम्बर | नाम | प्राथमिक | तह | प्रकार | भुक्तानी विधि | शुरु बजेट | थप | घट | अन्तिम बजेट | निकासा | जम्मा खर्च | बाँकी बजेट | गत वर्षको खर्च |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| २२२३१ | निर्मित सार्वजनिक सम्पत्तिको मर्मत सम्भार खर्च | नेपाल सरकार | | नगद | | १००,०००.०० | ०.०० | ०.०० | १००,०००.०० | ९७,५७४.०४ | ९७,५७४.०४ | २,४२५.९६ | |
| २२२९१ | अन्य सम्पत्तिहरुको संचालन तथा सम्भार खर्च | नेपाल सरकार | | नगद | | २०,०००.०० | ०.०० | ०.०० | २०,०००.०० | १६,०००.०० | १६,०००.०० | ४,०००.०० | |
| २२३११ | मसलन्द तथा कार्यालय सामाग्री | नेपाल सरकार | | नगद | | ३२०,०००.०० | ०.०० | ०.०० | ३२०,०००.०० | ३०१,९५६.२५ | ३०१,९५६.२५ | १८,०४३.७५ | |
| २२३१४ | इन्धन - अन्य प्रयोजन | नेपाल सरकार | | नगद | | ४५,०००.०० | ०.०० | ०.०० | ४५,०००.०० | ३१,९२०.०० | ३१,९२०.०० | १३,०८०.०० | |
| २२३१५ | पत्रपत्रिका, छपाई तथा सूचना प्रकाशन खर्च | नेपाल सरकार | | नगद | | २३५,०००.०० | ०.०० | ०.०० | २३५,०००.०० | २०८,५६६.०५ | २०८,५६६.०५ | २६,४३३.९५ | |
| २२४१२ | सूचना प्रणाली तथा सफ्टवेयर संचालन खर्च | नेपाल सरकार | | नगद | | १२०,०००.०० | ०.०० | ०.०० | १२०,०००.०० | ११८,४२५.०० | ११८,४२५.०० | १,५७५.०० | |
| २२५१२ | सीप विकास तथा जनचेतना तालिम तथा गोष्ठी सम्बन्धी खर्च | नेपाल सरकार | | नगद | | १७०,०००.०० | ०.०० | ०.०० | १७०,०००.०० | १६९,५७१.०० | १६९,५७१.०० | ४२९.०० | |
| २२५२१ | उत्पादन सामग्री / सेवा खर्च | नेपाल सरकार | | नगद | | ५,१३५,०००.०० | ०.०० | ०.०० | ५,१३५,०००.०० | ४,५९३,७५९.३५ | ४,५९३,७५९.३५ | ५४१,२४०.६५ | |
| २२६११ | अनुगमन, मूल्यांकन खर्च | नेपाल सरकार | | नगद | | २५०,०००.०० | ०.०० | ०.०० | २५०,०००.०० | २१०,९९७.५० | २१०,९९७.५० | ३९,००२.५० | |
| २२६१२ | भ्रमण खर्च | नेपाल सरकार | | नगद | | ९३०,०००.०० | ०.०० | ०.०० | ९३०,०००.०० | ८६७,८३८.५० | ८६७,८३८.५० | ६२,१६१.५० | |
| २२७११ | विविध खर्च | नेपाल सरकार | | नगद | | ८०,०००.०० | ०.०० | ०.०० | ८०,०००.०० | ७२,९५२.५० | ७२,९५२.५० | ७,०४७.५० | |
| २८१४३ | सवारी साधन तथा मेशिनर औजार भाडा | नेपाल सरकार | | नगद | | ९६,०००.०० | ०.०० | ०.०० | ९६,०००.०० | ९५,२००.०० | ९५,२००.०० | ८००.०० | |
| जम्मा | | | | | | १६,०४३,०००.०० | ७३०,०००.०० | २५०,०००.०० | १६,५२३,०००.०० | १४,९८३,३५२.८५ | १४,९८३,३५२.८५ | १,५३९,६४७.१५ | |

पेश गर्ने :-
हस्ताक्षर :-
नाम :-
दर्जा :-

श्री को.ले.नि.का. ललितपुरबाट ।
आ.व. २०७९/०८० को विनियोजन तर्फको
निकासा र खर्च भिड्को प्रमाणित भयो ।

प्रमुख कोष नियन्त्रक

प्रमुख

## पूजीगत खर्च बजेट खर्च उप शिर्षक: ३१२४११०१४

राष्ट्रिय बिउ बिजान प्रबिधि अनुसन्धान केन्द्र, खुमलटार, ललितपुर

कार्यालय कोड नं.: ३१२४१३४३५

दातृ निकायगत बजेट र खर्चको आर्थिक बिवरण

२०७९/८० साल

म. ले. प. फा. न. २१४

बजेट मुल शीर्षक नं : कृषि अनुसन्धान कार्यक्रम[३१२४११०१४]
कार्यालय / आयोजनाको नाम :
आयोजना रहेको स्थान :

| खर्च संकेत | | स्रोतको | | | | | | संशोधन /रकमान्तर/ श्रोतान्तर बाट | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| नम्बर | नाम | तह प्राथमिक | द्वितीय | स्रोत व्योहर्ने निकाय | प्रकार | भुक्तानी विधि | शुरू बजेट | थप | घट | अन्तिम बजेट | निकासा | जम्मा खर्च | बाँकी बजेट | गत वर्षको खर्च |
| ३११२१ | सवारी साधन | नेपाल सरकार | | | नगद | | ०.०० | ०.०० | ०.०० | ०.०० | ०.०० | ०.०० | ०.०० | |
| ३११२१ | सवारी साधन | नेपाल सरकार-आन्तरिक ऋण | | | नगद | | ३००,०००.०० | ०.०० | ०.०० | ३००,०००.०० | २७८,९००.०० | २७८,९००.०० | २१,१००.०० | |
| ३११२२ | मेशिनरी तथा औजार | नेपाल सरकार | | | नगद | | २००,०००.०० | ०.०० | ०.०० | २००,०००.०० | १९९,५५८.०० | १९९,५५८.०० | ४४२.०० | |
| ३११२२ | मेशिनरी तथा औजार | नेपाल सरकार-आन्तरिक ऋण | | | नगद | | २००,०००.०० | ०.०० | ०.०० | २००,०००.०० | १९९,४३३.५० | १९९,४३३.५० | ५६६.५० | |
| ३११२३ | फर्निचर तथा फिक्चर्स | नेपाल सरकार | | | नगद | | १००,०००.०० | ०.०० | ०.०० | १००,०००.०० | ९९,९२५.३४ | ९९,९२५.३४ | ७४.६६ | |
| ३११७१ | पूँजीगत सुधार खर्च सार्वजनिक निर्माण | नेपाल सरकार | | | नगद | | ६००,०००.०० | ०.०० | ०.०० | ६००,०००.०० | ५९७,२३०.७२ | ५९७,२३०.७२ | २,७६९.२८ | |
| जम्मा | | | | | | | १,४००,०००.०० | ०.०० | ०.०० | १,४००,०००.०० | १,३७५,०४७.५६ | १,३७५,०४७.५६ | ९५,९५२.४४ | |

नेपाल सरकार अर्थ मन्त्रालय महालेखा नियन्त्रक कार्यालय लेखा तथा लेखा नियन्त्रक कार्यालय ललितपुर

श्री को.ले.नि.का. ललितपुरबाट ।
आ.व. २०७९/०८० को विनियोजन तर्फको
निकासा र खर्च मिलानको प्रमाणित भयो

पेश गर्ने :-
हस्ताक्षर :- सुप्रिती
नाम :- सुप्रिती मानन्धर कर्माचार्य
दर्जा :- लेखा अधिकृत

प्रमुख कोष नियन्त्रक

प्रमुख

**Annex 14. राजश्व विवरण आ.ब. २०७९/८० (२०२२/२३)**

| आम्दानीको श्रोत | जम्मा रकम (रु.) | कैफियत |
|---|---|---|
| अनुसन्धान सेवा आदि बाट | ८११५७ | सेवा नमुना र अनुसन्धान नमुना परिक्षण बाट प्राप्त भएको |
| बिभिन्न प्रशासनिक बिबिध बाट | २५५० | बिभिन्न प्रशासनिक आम्दानी बाट प्राप्त रकम |
| **कुल जम्मा** | **८३,७०७** | |

**Annex 15. बेरुजु विवरण आ.ब.२०७९/८० (२०२२/२३)**

| आर्थिक बर्ष | बेरुजु रकम (रु.) | कैफियत |
|---|---|---|
| आ. ब. २०७४/७५ देखि २०७५/७६ सम्म | ८४२२५ | फछ्यौंटको प्रक्रियामा रहेको |
| **जम्मा बेरुजु** | **८४,२२५** | |