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Agricultural TECHNOLOGIES

ANIMAL SCIENCE

भाकृअनुप
ICAR

Indian Council of Agricultural Research
New Delhi

Agricultural Technologies
Commercialized/Ready for Commercialization

ANIMAL SCIENCE

Indian Council of Agricultural Research
New Delhi

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शरद पवार
SHARAD PAWAR

कृषि एवं खाद्य प्रसंस्करण उद्योग मंत्री
भारत सरकार
MINISTER OF AGRICULTURE &
FOOD PROCESSING INDUSTRIES
GOVERNMENT OF INDIA

Message

Indian agriculture has overcome several challenges in the past and achieved phenomenal success ensuring self-sufficiency in food production. The technologies generated within the National Agricultural Research System (NARS) have significantly contributed to the transformation of Indian agriculture and ushering Rainbow Revolution representing Green, White, Golden, Brown and Blue revolutions defining outstanding technology-led performance in foodgrain, milk, oilseeds and pulses, horticulture and fisheries sectors. Agriculture along with other primary sectors is a major source of strength for the Indian economy. However, burgeoning population, increasing demand for food, feed and fodder, decreasing land availability, natural resource degradation, decreasing factor productivity, climate change, slow growth in farm income and new global trade regulations have put new challenges threatening food, nutritional and livelihood security.

Technological interventions by the NARS have led to spectacular accomplishments relating to input use efficiency, climate resilience, mechanization and secondary agriculture leading to economic transformation. These coupled with the application of information and communication technology will play a critical role in our future endeavours to accelerate agricultural growth in the country. I am glad that the Subject Matter Divisions of Indian Council of Agricultural Research (ICAR) have synthesized and compiled practical and useful technologies in this series of publications on Agricultural Technologies in a user-friendly mode. I am sure this information will be useful to farming community, extension agencies, entrepreneurs and agro-industries in their efforts to make Indian agriculture economically viable and ecologically secure.

January 2014
New Delhi

(Sharad Pawar)

Foreword

Agriculture is the corner-stone of Indian economy. About 70% of India's 1.27 billion population live in rural areas with small and marginal land holdings. India with a geographical area of over 328 million hectares is endowed with diversity of climate, soils and vegetation. This rich resource endowment is, however, threatened with ever increasing population, vagaries of nature and climate change. The National Agricultural Research System (NARS) comprising the Indian Council of Agricultural Research (ICAR), 55 State Agricultural Universities, five Deemed Universities, four Central Universities with agriculture faculty, one Central Agricultural University and 637 Krishi Vigyan Kendras have attained excellence in several frontier areas of agricultural sciences and technology contributing significantly towards the spectacular growth of Indian agriculture during past 60 years.

Initiatives by NARS in the country have led to notable accomplishments resulting in the socio-economic transformation of farmers. The agriculture sector is, however, witnessing radical changes and challenges both at national and global level. The emerging challenges and opportunities necessitate wider and faster adoption of the improved technologies by all the stakeholders right from production to consumption in a food chain. In an effort to achieve this, the divisions of crop science, horticulture, animal science, natural resources management, fisheries and agricultural engineering in the ICAR have compiled the technologies already commercialized and the technologies ready for commercialization. This series of publications, brings out the salient features of the technologies with details on potential users and contact details of the developers for ready and easy access. It will be our endeavour to periodically update this Technology Series. I hope that this publication would be useful to the farming community, extension agencies, entrepreneurs and industry. I greatly appreciate the efforts put in by my colleagues in the Council, research institutes and State Agricultural Universities (SAUs) in bringing out this compilation.

(S Ayyappan)
Secretary,
Department of Agricultural Research and Education, and
Director General
Indian Council of Agricultural Research
New Delhi

January 2014
New Delhi

Preface

The research and development outcome needs to be expressed into viable and visible technologies. Popularization and commercialization of patent technologies are essential for upscaling and dissemination to stakeholders and application in overall productivity enhancement with quality assurance. The researchers should turn their inventions/innovations into business opportunities to make a positive impact on the livestock sector in the country.

This endeavour is a bouquet of technologies, commercialized and ready for commercialization, which have been collated to cover animal genetic resources, animal production and health (diagnostics and vaccines), products and processes. This will encourage entrepreneurship and help in developing linkages, between the research organizations and small and large commercial houses for future need-based research and also financial support.

The compilation has a wide range of technologies developed by Animal Science Research Institutes and State Veterinary Universities and the National Agricultural Research System.

With the active patrongage of Dr S. Ayyappan, Secretary, DARE and DG, ICAR- the Animal Science Division of the ICAR foresees that this collection of technologies will serve not only as a valuable source for various technologies for stakeholders but also give impetus for development of need-based technologies for farmers and small/large commercial houses through close collaboration between the indentors, the research organizations and Universities for contributing towards the compilation for the benefit of the Animal Sector of the country.

Dr K M L Pathak
Deputy Director General (Animal Science)
ICAR, New Delhi

CONTENT

CARI-Brown

Salient features

- Japanese quails are highly prolific birds and suitable for different agro-climatic conditions in India

Performance

- Heavy body weight-cum-meat type
- Plumage colour : completely brown
- Age at sex maturity : 38-41 days
- Body weight at 5 week : 180 to 185 g
- Daily feed consumption : 25-28 g
- Hatchability on total egg set : 60-65%

Cost

- Germplasm pure line adult Japanese quails @ ₹ 45 (either sex)
- Germplasm pure line fertile eggs @ ₹ 15/egg (either meat or egg type)

Impact and benefits

- Indian quail cannot be bred in captivity for commercial farming. However, the Japanese quail can be reared in captivity; highly prolific birds for breeding and commercialization as an alternative to chicken
- Japanese quail (*Coturnix Japonica*) is not a wild quail and as such not a scheduled protected wild bird as defined under sub-section 36 of section 2 of the Wildlife (Protection) Act, 1972. Act schedule IV includes only Quails Rhasianidae (Indian quail) and not the Japanese quail, which was brought to India by CARI from abroad
- The variety is highly disease resistant without any routine immunization and vaccination. It is easy to manage quails as they require less feed, minimum space and affordable investment

Name and addresses of the firms/entrepreneurs to whom the technology has been transferred

- GraceFarm Innovations- Rural Employment & Educational Trust (GI-REET), Kayakumari district of Tamil Nadu; Agribusiness Management Centre,

Ghaziabad, Uttar Pradesh. The improved quail germplasm was also supplied to different organizations/poultry farmers/entrepreneurs in the different regions of the country which includes supply to United Poultry Farm, Gonda, Uttar Pradesh; U.P. State Government Poultry Farm, Chak Gajaria, Lucknow; BHU, Varanasi, Uttar Pradesh; M/s Cipra Associate, Jamalpur Road, Patna; Baba Poultry farm, Gaya, Bihar; Assistant Director, Puralia, West Bengal; Deputy Director ARO (PM), West Bengal; RAU, Pusa, Samastipur; Veterinary College, Ranchi (Jharkhand); CPDO, Bhuwneshwar; CSIR, AIIMS and Shriram Honda Research Institute, New Delhi.

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Fax: 0581-2301321, E-mail: cari_director@rediffmail.com

CARI-Ujjwal

Salient features

- Japanese quails are highly prolific and suitable for different agro-climatic conditions in India

Performance

- Heavy body weight-cum-meat type

- Body weight at 5 week : 175 g
- Feed efficiency : 2.80
- Daily feed consumption : 25-28 g
- Hatchability on total egg set : 65%

Cost

- Germplasm pure line adult Japanese quails @ ₹ 45 (either sex)
- Germplasm pure line fertile eggs @ ₹ 15/egg (either meat or egg type)

Impact and benefits

- Indian quail cannot be bred in captivity for commercial farming. However, the Japanese quail can be reared in captivity; highly prolific birds for breeding and commercialization as an alternative to chicken
- The variety is highly disease resistant without any routine immunization and vaccination. It is easy to manage quails as they require less feed, minimum space and affordable investment

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CARI-Uttam

Special feature

- Japanese quails are highly prolific birds and suitable to different agro climatic conditions in India

Performance

- Heavy body weight-cum-meat type
- Body weight at 5 week : 240 g
- Feed efficiency : 2.51
- Daily feed consumption : 25-28 g
- Hatchability on total egg set : 70-75%

Cost

- Germplasm pure line adult Japanese quails @ ₹ 45 (either sex)
- Germplasm pure line fertile eggs @ ₹ 15/egg (either meat or egg type)

Impact and benefits

- Indian quail cannot be bred in captivity for commercial farming. However, the Japanese quail can be reared in captivity; highly prolific birds for breeding and commercialization as an alternative to chicken
- The variety is highly disease resistant without any routine immunization and vaccination. It is easy to manage quails as they require less feed, minimum space and affordable investment

If commercialized, name and addresses of the firms/entrepreneurs to whom the technology has been transferred

- GraceFarm Innovations- Rural Employment & Educational Trust (GI-REET), Kayakumari district of Tamil Nadu; Agribusiness Management Centre,

Ghaziabad, Uttar Pradesh. The improved quail germplasm have also been supplied to different organizations/poultry farmers/entrepreneurs in the different regions of the country which includes supply to United Poultry Farm, Gonda, Uttar Pradesh; U.P. State Government Poultry Farm, Chak Gajaria, Lucknow; BHU, Varanasi, Uttar Pradesh; M/s Cipra Associate, Jamalpur Road, Patna; Baba Poultry Farm, Gaya, Bihar; RAU, Pusa, Samastipur; Assistant Director, Puralia, West Bengal; Ranchi Deputy Director ARO (PM), West Bengal; Ranchi Veterinary College, Ranchi (Jharkhand); CPDO, Bhuwneshwar; CSIR, AIIMS and Shriram Honda Research Institute, New Delhi.

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CARI-Sunheri

Special feature

- Japanese quails are highly prolific birds and suitable for different agro-climatic conditions in India

Performance

- Heavy body weight-cum-meat type
- Age at sex maturity : 43 days
- Body weight at 5 weeks : 182 g
- Feed conversion ratio : 2.8
- Average egg weight : 11 g
- Age at 50 per cent egg production : 8 weeks
- Age at peak egg production : 12-13 weeks
- Hatchability on total egg set : 68 %

Cost

- Germplasm pure line adult Japanese quails @ ₹ 45 (either sex)
- Germplasm pure line fertile eggs @ ₹ 15/egg (either meat or egg type)

Impact and benefits

- Indian quail cannot be bred in captivity for commercial farming. However, the Japanese quail can be reared in captivity; highly prolific birds for breeding and commercialization as an alternative to chicken
- This variety is highly disease resistant without any routine immunization and vaccination. It is easy to manage quails as they require less feed, minimum space and affordable investment

Name and addresses of the firms/entrepreneurs to whom the technology has been transferred

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Ghaziabad, Uttar Pradesh. The improved quail germplasm was also supplied to different organizations/poultry farmers/entrepreneurs in the different regions of the country which includes supply to United Poultry Farm, Gonda, Uttar Pradesh; U.P. State Government Poultry Farm, Chak Gajaria, Lucknow; BHU, Varanasi, Uttar Pradesh; M/s Cipra Associate, Jamalpur Road, Patna; Baba Poultry Farm, Gaya, Bihar; RAU, Pusa, Samastipur; Assistant Director, Puralia, West Bengal; Deputy Director ARO (PM), West Bengal; Ranchi Veterinary College, Ranchi (Jharkhand); CPDO, Bhuwneshwar; CSIR, AIIMS and Shriram Honda Research Institute, New Delhi.

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CARI-Sweta

Special feature

- Japanese quails are highly prolific birds and suitable for different agro-climatic conditions in India

Performance

- Low body weight line or egger type
- Body weight at 5 week : 155 to 165 g
- Feed efficiency : 2.70
- Daily feed consumption : 25 g
- Hatchability on total egg set : 50-60%

Cost

- Germplasm pure line adult Japanese quails @ ₹ 45 (either sex)
- Germplasm pure line fertile eggs @ ₹ 15/egg (either meat or egg type)

Impact and benefits

- Indian quail cannot be bred in captivity for commercial farming. However, the Japanese quail can be reared in captivity; highly prolific birds for breeding and commercialization as an alternative to chicken
- This variety is highly disease resistant without any routine immunization and vaccination. It is easy to manage quails as they require less feed, minimum space and affordable investment

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CARI-Pearl

Special features

- Japanese quails are highly prolific birds and suitable for different agro-climatic conditions in India

Performance

- Low body weight line or egger type
- Body weight at 5 week : 140 g
- Daily feed consumption : 20-25 g
- Age of 50 per cent egg production : 8 weeks
- Age of 80 per cent egg production : 10 weeks
- Hen day production : 285-295 eggs
- Hatchability on total egg set : 70-80%

Cost

- Germplasm pure line adult Japanese quails @ ₹ 45 (either sex)
- Germplasm pure line fertile eggs @ ₹ 15/egg (either meat or egg type)

Impact and benefits

- Indian quail cannot be bred in captivity for commercial farming. However, the Japanese quail can be reared in captivity; highly prolific birds for breeding and commercialization as an alternative to chicken
- This variety is highly disease resistant without any routine immunization and vaccination. It is easy to manage quails as they require less feed, minimum space and affordable investment

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CARI- Swetambari

Special feature

- The birds were developed through selective selection and breeding programme from a wide base stock. These birds have been improved for high disease resistance and better growth

Performance

- Pure white in colour
- Body weight at 12 weeks : 920-980 g
- Age at first egg : 230-250 days
- Egg weight : 38-40 g
- Egg production (March to September) : 100-115 eggs
- Fertility : 70-75%
- Hatchability : 70-80%
- Livability : excellent

Cost

- Adult female ₹ 130/bird
- Adult male ₹ 150/bird

Impact and benefits

- There is no requirement of elaborate and expensive housing. It has excellent foraging capabilities and consumes all non-conventional feed not used in chicken feed. It is more tolerant to mycotoxins
- Guinea fowl meat is rich in vitamins and low in cholesterol

Name and addresses of the firms/entrepreneurs to whom the technology has been transferred

- The germplasm has been supplied to different organizations / poultry farmers / entrepreneurs in the different regions of the country

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CARI- Chitambari

Special features

- The birds were developed through selective selection and breeding programme from a wide base stock. These birds have been improved for high disease resistance and better growth

Performance

- White spot on gray plumage
- Body weight at 12 weeks : 970-1,000 g
- Age at first egg : 232-251 days
- Egg weight : 38-40 g
- Egg production (March to September) : 105-125 eggs
- Fertility : 70-73%
- Hatchability : 70-80%
- Livability : excellent

Cost

- Adult female ₹ 130/bird
- Adult male ₹ 150/bird

Impact and benefits

- There is no requirement of elaborate and expensive housing. It has excellent foraging capabilities and consumes all non-conventional feed not used in chicken feed. It is more tolerant to mycotoxins. Guinea fowl meat is rich in vitamins and low in cholesterol
- It is a hardy bird, suitable for any agro-climatic condition

Name and addresses of the firms/entrepreneurs to whom the technology has been transferred

- The germplasm has been supplied to different organizations / poultry farmers/ entrepreneurs in the different regions of the country

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