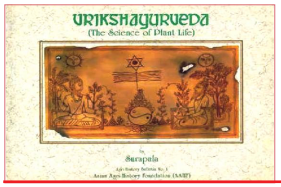

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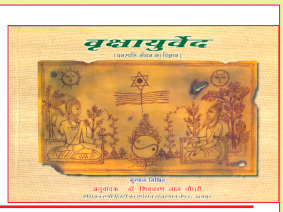

VRIKSHAYURVED FARMING NEWS

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Chief Editor's Note :

This edition of Vrikshayurved Farming News has a special Tribute Note for late Dr YL Nene, the Founder Chairman of the Asian Agri-History Foundation (AAHF), from Dr SPS Beniwal, his former student and the current Chairman of AAHF. I am sure the readers will find it immensely educative, useful and inspiring.

- J Kumar

Dr Yeshwant Laxman Nene: A Legendary Agricultural Scientist and Pioneer of the Indian Agricultural Heritage

(Courtesy: Dr SPS Beniwal, Chairman, AAHF, GBPUA&T, Pantnagar; Mob: 8937005550)

A legendary agricultural scientist of India. Dr Yeshwant Laxman Nene (24 Nov 1936 – 15 Jan 2018) was a legendary and luminary agricultural scientist of modern India. His 36 years of professional career in agriculture research started in 1960 as Assistant Professor of Plant Science in the College of Agriculture in Pantnagar ended according to his wish five years before his retirement in 1996 as the Deputy Director General of International Crops Research Institute for the Semi-Arid Tropics (ICRISAT), Hyderabad. He is internationally known for his contributions to plant pathology and agriculture. Notable among his many contributions was finding the cause and control of the mysterious dreaded Khaira disease of paddy in 1965, which was threatening extinction of paddy from the Tarai region of Uttar Pradesh. For this pioneering work he received the International Rice Research Prize in 1967 from FAO of the United Nations. Likewise, his work on the viral diseases of warm season *(kharif)* pulses was recognized internationally. While at ICRISAT (from 1974-1996), he resolved the problem of so-called "wilt complex" of chickpea. He is well recognized to develop simple disease-resistance screening techniques for laboratory, greenhouse and field conditions as well as multiple-disease field screening systems for major chickpea and pigeonpea diseases, which are widely used internationally. He was internationally recognized as the world leader in grain legume research. Based on his contributions, he was elected as the Fellow of the American Phytopathological Society (APS) in 1990, the second person in India to receive this honour. He was conferred by GBPUA&T, Pantnagar the honorary degree of Doctor of Science in 1991 in recognition of the "singular contribution to the cause of agricultural research, education and development".

Pioneer of Indian agricultural heritage. His idea behind seeking early retirement from ICRISAT at 60 years in 1996, five years before the mandatory retirement of 65, was to devote his fulltime and energy to fulfil his cherished dream form his PhD student days in USA to study agricultural history and its heritage in India. With this in mind, he established the Asian Agri-History Foundation (AAHF) that he conceptualized and founded in 1994 to unearth and disseminate information on the history of the Asian agriculture with special emphasis on India.

Dr Nene had soon realized the challenge of discovering old agricultural manuscripts from ancient and medieval times of Asia was not as easy it seemed. However, with his persistent efforts Dr Nene could find an old Sanskrit manuscript of *Vrikshayurveda* by Surapala (c. 1000 CE) in the form of a microfiche in the Bodleian Library, Oxford, UK in 1994. He got the manuscript translated into English by Prof Nalini Sadhale, Professor of Sanskrit in Osmania University, Hyderabad, who took two years to translate the Sanskrit manuscript into English. It was Prof Sadhale only who also translated other Sanskrit manuscripts into English.

As the Founder Chairman of AAHF, Dr Nene's outstanding achievements have been in the publication of (i) 11 Classical Technical Bulletins on Asian Agriculture, (ii) starting a quarterly journal of Asian Agri-History, (iii) publishing five AAHF books, National and International Conference Proceedings (7 in number), and AAHF Research Report (one). These AAHF publications because of their usefulness and importance have now received attention and appreciation throughout the world. Thanks to Dr Nene's efforts that the world literature in agriculture is now enriched with hitherto little known contributions made by ancient and medieval Indian scholars and farmers through millennia. It is due to his dedicated planning, hard work and efforts that that AAHF is already "a landmark in the annals of Indian agriculture". Among all the 11 Classical Bulletins, Bulletin No. 1 *Vrikshayurveda* (The Science of Plant Life) (c. 1000 CE) by Surapala has been found extremely useful in India and elsewhere in promoting sustainable agriculture including organic cultivation in India and elsewhere. Likewise, Bulletin No. 2 *Krishi-Parashara* (Agriculture by Parashara) (c. 400 BCE) provides very useful information on agricultural practices that were followed in ancient India.

Dr Nene studied *Vrikshayurveda* by Surapala in detail and wrote a "Commentary on Ailments" in the English version of the book. He had in depth understanding of the *Vrikshayurveda* practices described in the book and followed them for their validation. He was responsible for converting the original non-vegetarian *Kunapajala* to Vegetarian *Kunapajala* and then to Herbal Kunapajala, which is now being used by farmers in several states of India. The practices described in Surapala's *Vrikshayurveda* were also applied by Mr Valmiki Srinivasa Ayangara for producing organic tea in Abali Tea Estate, Roing, Arunachal Pradesh, results of which were published as Agri-History Report No. 1 (2006) Organic Tea – A *Vrikshayurveda* experience.

Dr Nene he is well recognized world over for his leadership in revitalizing agricultural history in Asia particularly in India. His contributions to understanding of the ancient and medieval knowledge of agriculture of Asia especially India are and unparalleled. He was a staunch supporter and promoter of Vedic agriculture through *Vrikshayurveda* of Surapala and strongly believed in its great potential and relevance to present-day Indian agriculture to rectify the damages of the green revolution such as maintenance of soil health, crop growth and productivity, maintenance of biodiversity, and protecting environment and human health. Rectification of these damages will certainly help Indian agriculture and will continue to do so in future as well especially the organic farming. It would be very fair to state that all the indigenous knowledge that different experts, social workers and institutions are now promoting in India originate from *Vrikshayurveda* of Surapala. Because of his deep understanding of *Vrikshayurveda* and its application in modern agriculture Dr Nene deserves to be called as the "Surapala of Modern India". For all his precious contributions, Dr Nene will certainly be remembered for a very long time to come as a great, rare and legendary agricultural scientist of modern India. The Indian agriculture and we all owe him a profound gratitude.

Success Story of Ms. Ayesha Grewal, an Organic farmer

(Courtesy: Dr. Disha Pant, Assistant Professor, College of Veterinary and Animal Sciences, GBPUAT, Pantnagar-263145, Uttarakhand; Mob: 9690307185)

Ms. Ayesha Grewal is a Delhi based young entrepreneur, who is practicing organic farming at Mankandpur, Nainital District of Uttarakhand for the last three years. She has been in this stream since 2004. She started her journey in organic farming in Uttarakhand from Ramgarh block in district Nainital. She has promoted organic cultivation of fruits in the hilly areas, procuring fruits directly from farmers for marketing and value-added products (jams, jellies, squashes, etc.) outside Uttarakhand. Currently, she is practicing farming at Mankandpur where she herself is engaged in cultivation and experimenting new ideas in organic horticulture. She also encourages the local farmers of the area to cultivate different varieties of common vegetables like tomato, pumpkin, parsley, celery, etc. The crops are nourished in an organic environment by using cow dung, green leaves manure and vermi-compost as bio-fertilizers. These items are purchased from the farmers at fair prices and are marketed directly to the national capital. Her initiative is not only a step towards enhancing income opportunities to small and marginal farmers but also adoption of traditional Indian agricultural practices that have been overlooked due to modern agricultural practices. The entrepreneur also aims to cultivate some medicinal plants like *Harad* and *Amla* as a future perspective.

Use of Herbal *Kunapjala*: A key for success of an innovative farmer of district Almora

(Courtesy: Dr. Sunita T Pandey, Professor, Agronomy, GBPUAT, Pantnagar; Mob: 9412120735)

Mr Ranjeet Singh Bisht (Mobile: 7530904077) is an enthusiastic and innovative farmer of village Dhamas, block Hawalbagh, district Almora, Uttarakhand. After participating in training programme on awareness, preparation and use of Herbal *Kunapajala* under a project "Exploring Livelihood Potential of Wild Growing Stinging Nettle (Urtica dioica) in Uttarakhand" sponsored by the Ministry of Environment, Forest and Climate Change, Government of India under National Mission of Himalayan Studies (NMHS), he got motivated and started cultivation in 50 *nali* area in Hawalbagh block, which is sandy and not very fertile. He cultivated a number of crops including fruit, vegetable and flower crops, viz. apple, walnut, tomato, marigold, ginger, turmeric, pea, bell paper, gladiolus, beans, onion, etc. and used Herbal *Kunapajala* in every crop. He is very much satisfied with the incremental increase in the quality and quantity (yield) of all the crops after application of Herbal *Kunapajala*. The other farmers of the nearby area are very surprised to see the good performance of various crops his field. Mr. Bisht started the cultivation from post-covid time as a farm. He applied *Kunapajala* regularly at 10-15 days interval in every crop and got amazingly good performance in every crop. He has harvested good quality bumper yields from pea, onion, marigold, tomato. All the fruits trees planted only this year are performing very well. Mr. Ranjeet Singh Bisht is very happy and advising other farmers of his block to prepare and use Herbal *Kunapajala* in their field for low-cost but effective sustainable organic farming.

Heavy branching and fruiting in Tomato

Bell pepper

Marigold

Use of Herbal Kunapajala: A Success Story of *Mahila Mangal Dal*, village Lodh, block Takula, Almora

(Courtesy: Dr Uma Nauliya, SMS, KVK Matela, district Amlora; Mob: 7037120180)

Hansi devi Negi (Mob. 9411119420) *Adhyaksha* (Chairperson) of *Mahila Mangal Dal* at village Lodh, block Takula, district Almora, is an innovative and active lady farmer. She attended an awareness, training and demonstration programme on preparation of herbal *Kunapajala* and its use in different field crops, vegetables and fruits crops under the project "Exploring Livelihood Potential of wild stinging nettle *(Uritica dioica)* in Uttarakhand funded by Ministry of Environment, Forest and climate change Government of India under National Mission of Himalayan Studies (NMHS). The project was launched at Lodh village in September 2020. A group of *Mahila Mangal Dal* was motivated by conducting awareness program followed by hands-on training. Mahila Mangal Dal adhyksha, Hansi Devi Negi took the lead. All the lady farmers of the group tried *Kunapajala* on their onion and garlic crops. Prior to transplanting their onion seedlings they dipped their roots in

Kunapajala and then applied *Kunapajala* at 15 days interval. Good onion yield (1.5 quintal from 1/2 nali, i.e., 100m² area) and garlic yield (30 kg out of 4x4 sq meter area plot) were obtained. The size and quality of both onions and garlic were also good. Thus, they are very happy to see the results from the use of Herbal *Kunapajala* in onion and garlic crops. They are also using Herbal *Kunapajala* on cucurbits, tomato, brinjal and other vegetables crops. So far, the growth of these crop plants is very satisfactory, and good results are expected from these crops also.

Potato

Onion

Usefulness of Herbal *Kunapajala* in managing stem (rhizome) rot of ginger

(Courtesy: Dr Laxmi Rawat, Asst Professor, and Ms. Sonam Bhatt, MSc student, Plant Protection, Ranichauri Campus, VCSG Uttarakhand University of Horticulture and Forestry, Bharsar, Uttarakhand; Mob: 9719431521)

Stem/rhizome rot caused by *Pythium* spp. or *Fusarium* spp. alone or in combination by both, is a serious disease of ginger with annual recurrence in Narendranagar-Tehri area of Garhwal region in Uttarakhand. The disease can cause crop losses of up to 50-90 % in a crop season and thus has been significantly reducing ginger production in the area for the last several years. In the 2020 crop season (March-October), a field experiment was conducted in a randomized block design with three replications to evaluate the efficacy of chemical fungicides, bio-agents and herbal *Kunapajal.* The experiment comprised of 13 treatments and an untreated control with 5x5 m plot size with nine fungicides (Carbendazim 50% WP @0.2%, Mancozeb 75% WG @ 0.3%, Carbendazim 12% + Mancozeb 63% WP @0.3%, Metalaxyl 4% + Mancozeb 64% @ 0.25%, Metalaxyl 3.3% + Chlorothalonil 33.1 SC @ 0.25%, Copper oxychloride 50% WG @ 0.25%, Propiconazole 25% EC @ 0.1%, Hexaconazole 5% SC @ 0.1%, Tebuconazole 25.9% EC @ 0.1%), two bio-agents (Trichoderma harzianaum and Pseudomonas fluorescens) applied alone @ 10 g/l and in combination @ 5 g each/l), and one liquid organic manure (Herbal *Kunapajala* @ 1:10 dilution). The mode of application of each treatment (excluding Herbal *Kunapajala*) was one protective drenching which was given at 60 DAS before the emergence of the disease and two foliar sprays (first at disease appearance and the second was at 15 days after the first spray). In case of Herbal *Kunapajala* @ 1:10 dilution, three protective drenching were applied at 30, 45 and 60 DAS, respectively, and two foliar sprays were given (first at disease appearance and the second was at 15 days after the first spray).

In present field trial, Metalaxyl 4% + Mancozeb 64% @ 0.25% and *T. harzianum* + *T. fluorescens* at 5g each/l were found most effective in controlling disease severity with percent disease reduction over control of 88.67% and 80.21%, respectively, whereas the treatment of Herbal Kunapajal and *T. harzianum* + *T. fluorescens* were found most effective in promoting plant growth parameters (e.g., plant height, number of tillers and number of leaves). Herbal *Kunapajala* was also found effective in reducing disease severity to 66.21% over the control plots. With respect to yield also, Metalaxyl 4% + Mancozeb 64% @ 0.25% was found significantly superior with highest rhizome yield of 34.58 kg/plot and 36.66% yield increase over the control, followed by *T. harzianum* + *T. fluorescens* with rhizome yield of 30.21 kg/plot and 27.50% yield increase over control which was at par with Herbal *Kunapajala* which recorded rhizome yield of 27.60 kg/plot and showed 20.65% increase over control where untreated control showed minimum rhizome yield of 21.90 kg/plot.

Herbal *Kunapajala* is known to increase plant growth and reproduction in several vegetable crops. It should be mentioned here that the herbal *Kunapajala* that was used was prepared by using only two antifungal plants. It would be interesting to see the results in the repeat trial by using herbal *Kunapajala* with several plants/weeds. But results of this trial do open a novel avenue for its use by farmers for improving the yields of ginger and controlling disease severity of stem/rhizome/soft rot under organic farming conditions in this region where it is known to occur every year.

Field view of trial

Disease-affected ginger plant

Infected rhizome

Ayurvedic Pioneers in Animal Health and Diseases

(Courtesy: Dr. Ajay Kumar Upadhyay1 and Dr. Maansi, College of Veterinary and Animal sciences, GBPUAT, Pantnagar-263145; Mob: 9411195407)

Ashwini Kumaras: The earliest account of ancient Indian civilization is Rigveda (8000 BCE), which mentions that Ashwini Kumaras known as Dev Vaidya were the chief surgeons of Vedic periods, who had performed rare legendary surgical operations which included the first plastic surgery to re-join the head and trunk of saint Chyavana , beheaded by Dakshya. Their other noticeable works include an eye operation of Reejashva and the implantation of teeth of Phushna in the toothless mouth. They also transplanted an iron leg on Bispala - the wife of King Khela who lost her leg in war. Ashwini Kumaras had performed both homo- and hetro-transplantation during the very the ancient time of Rigveda; such miraculous magical surgical skill of the Rigvedic period may seem mere clandestine to modern medical sciences.

Dhanvantari: Dhanvantari, one of the foremost physicians, made a comprehensive guide to practitioners. He mentioned clear instructions on the pre-treatment of patients, types of adjuvants, bioactivators and postprandial drinks *(anupana)* to be administered with the medicines, dietary restrictions and precautions to be taken with mercurials. He has also described many fevers like *bhautika, mandhara, krsnamandhara, ekahika, dvvahik, trvahika, caturahika, pancahika, paksika* and *rnasika.* For diagnosis of diseases, he recommends the asthasthanapariksa or examination of pulse *(nadi)*, urine *(mutra)*, feces *(mala),* tongue *(jihva),* eyes *(netra),* general appearance *(rupa),* voice *(sebda)* and skin *(sparse)* of the patient.

Rishi Bharadwaja: A renowned scholar, and economist - Rishi Bharadwaja, has been known as the first man to have studied medical science from Dhanvantri.

Atreya: Atreya was a renowned scholar of Ayurveda and six schools of early Ayurveda were founded based on his teachings. He is credited as the writer of Bhela Samhita, dating to a period of 6th century BCE. He is believed to have worked as the personal physician of King Nagnajita of Gandhara Kingdom, who finds mention in the Mahabharata. The original contents of 'Charaka Samhita' are credited to Atreya, which were in turn codified and edited by Agnivesha and Charaka.

Charak: The genuine and systematic anthology of medical science of India was compiled by Charak in *'Charaka Samhita',* which describes human embryology, anatomy, physiology, various diseases and their treatment. It describes the work of ancient medical practitioners such as Acharya Atreya and Acharya Agnivesh of 800 BCE and contains the Principle of Ayurveda. It remained the standard textbook of Ayurveda for almost for 2000 years. They were followed by Sushruta, a specialist in cosmetic, plastic, and dental surgery.

Sushruta: Sushruta, an ancient Indian surgeon is known for his pioneering operations and techniques and for his influential treatise *'Sushruta-Samhita'*, the main source of knowledge about surgery in ancient India. Sushruta lived 2000 years ago in the ancient city of Kashi, now known as Varanasi or Banaras in the northern part of India. Sushruta has described surgery under eight heads: *Chedya* (excision), *Lekhya* (scarification), *Vedhya* (puncturing), *Esya* (exploration), *Ahrya* (extraction), *Vsraya* (evacuation), and *Sivya* (suturing). All the basic principles of surgery such as planning precision, haemostasis, and perfection find important places in Sushruta's writings on the subject. He has described various reconstructive procedures for different types of defects. He describes 60 types of *upkarma* for treatment of wound, 120 surgical instruments and 300 surgical procedures, and classification of human surgeries in eight categories. Sushruta probably for the first time had also induced anaesthesia using intoxicants such as wine and henbane *(Cannabis indica)*. He treated numerous cases of *Nasa Sandhan* (rhinoplasty), *Oshtha Sandhan* (lobuloplasty), and *Karna Sandhan* (otoplasty). Even today, rhinoplasty described by Sushruta in 600 BCE is referred to as the Indian flap and he is known as the originator of plastic surgery.

Shalihotra: Shalihotra, a 3rd Century BCE expert on animal rearing and healthcare, is known for composing the Shalihotra Samhita, which was based on Ayurveda and extensively documented the treatment of diseases using medicinal plants. This knowledge was believed to have been revealed to Shalihotra by Lord Brahma himself. The principal subject matter of the Shalihotra Samhita is the care and management of horses. The treatise consists of 12,000 verses and has been translated into Persian, Arabic, Tibetan and English. It describes equine and elephant anatomy and physiology, with a laundry-list of diseases and preventive measures. It also details the body structure, elaborates on breeds and contains notes on the auspicious signs to watch for while buying a horse.

Jivaka: Jivaka was the personal physician of the Buddha and the Indian King, Bimbisara. He lived in Rajagrha, present-day Rajgir, in the 5th century BCE. He went to Taksasila, to learn traditional medicine. In the texts, Jivaka is depicted performing complicated medical procedures, including those that could be interpreted as brain surgery. Up until the present day, Jivaka is honoured by Indians, Chinese and Thai as a patron of traditional medicine, and he has a central role in all ceremonies involving Thai traditional medicine.

Vagbhata: Vagbhata (600 CE) is one of the most influential writer, scientist, doctor and advisor of ayurveda. Several works are associated with his name as an author, principally the Ashta?ga sa?graha and the Ashtanga hridayasa? hita. Ashtanga in Sanskrit means 'eight components' and refers to the eight sections of Ayurveda as internal medicine, surgery, gynaecology and paediatrics, rejuvenation therapy, aphrodisiac therapy, toxicology, and psychiatry or spiritual healing, and ENT (ear, nose and throat). There are sections on longevity, personal hygiene, the causes of illness, the influence of season and time on the human organism, types and classifications of medicine, the significance of the sense of taste, pregnancy and possible complications during birth, prakriti, individual constitutions and various aids for establishing a prognosis. There is also detailed information on five-action therapies including therapeutically induced vomiting, the use of laxatives, enemas, complications that might occur during such therapies and the necessary medications. The A?h?a?ga h?idayasa? hita is perhaps Ayurveda's greatest classic, and copies of the work in manuscript libraries across India and the world outnumber any other medical work.

Nagarjuna: Another great practitioner of medicines in ancient India (150 to 250 CE), who has written Jivasutra, Rasavaisesikasutra, Yogasataka, Kaksaputa, Yogaratnamala and several other books describing medicines along with other life skills.

Sage Patanjali: Sage Patanjali (200 BCE), is the author of a medical text called Patanjalatantra. He is cited and his text is quoted in many medieval health sciences-related texts. In presently available Charak Samhita, seventeen chapters of Chikitsa sthana and complete Kalpa sthana and Siddhi sthana were added later by Dridhabala, who lived during 4th – 5th centuries CE. The text starts with sutra sthana which deals with fundamentals and basic principles of Ayurveda practice.

Bhavmisra: Another Ayurvedachaya, Bhavmisra wrote his treatise 'Bhavaprakasha' in 16th century CE, which was one of the best compilations of medical knowledge prevalent in medieval period on the use medicinal plants and treatment of various diseases. His work explained the basic concepts and five purificatory procedures (pancha karma) along with Nighantu (lexicon). The Nighantu part clarifies many controversies on medicinal plants and exemplified many exotic plants species.

Attention

Please send your contributions to the Newsletter to

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