

RESUME of Dr P.C. NAUTIYAL



1. Full Name: Prakash Chandra Nautiyal (P.C. Nautiyal)
2. Designation: Professor (Adjunct Faculty)
Department of Seed Science & Technology, HNB Garhwal University, Srinagar Garhwal
3. Ex- **Principal Scientist**, Seed Science and Technology, ICAR-IARI, New Delhi-110012.
4. Date of Birth: 2 June 1955
5. Date of Superannuation: 30 June 2017 (From ICAR-IARI, New Delhi)
6. Discipline (in Agricultural Research Service): Plant Physiology/Agronomy/Seed Science and Technology (Based on work experience)).
7. Present Address: Department of Seed Science & Technology, HNBGU Srinagar Garhwal
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11. **Specialization** in crops, such as, Groundnut (Oilseed crop), Bambara groundnut, Soybean (Pulse crops), Wheat, Maize, Rice (Cereals) and *Ragi* (Millet) in the following areas:

Broad Areas of Interest

- i. Crop Physiology
- ii. Seed Science and Technology
- iii. Eco-physiology
- iv. Agronomy: Water Use Efficiency, Nutrient Use Efficiency, Irrigation Water Management
- v. Organic Farming in Hill Agro-eco system
- vi. Sustainable Agriculture and Mountain Development
- vii. Farmers Participatory Approach in Agriculture
- viii. Watershed Development & Irrigation Management
- ix. Plant Breeding and Molecular Biology
- x. High Temperature Tolerance and Crop Productivity
- xi. Integrating Research and Teaching
- xii. Enhancing the quality of overall Education

Specialised Areas of Interest

1. Breeding for water use efficiency in groundnut
2. Characterization of root parts in groundnut for drought tolerance
3. Characterization of wheat RIL populations for drought tolerance
4. Characterization of wheat RIL populations for seed and seedling vigour
5. Characterization of heat-shock proteins, i.e., ER and MT-sHSPsin transgenic tomato
6. Testing of groundnut varieties for water use efficiency (developed based on high HI and low SLA) in rain-fed and irrigated systems in the farmers field in farmers participatory approach
7. Seed production in groundnut in farmers' participatory approach
8. Seed Physiology and Seed Invigoration
9. Irrigation Science and Watershed Management
10. High temperature tolerance in Maize hybrids
11. Soil salinity and groundnut cultivation in coastal areas
12. Introduction of Bambara groundnut crop in semi-arid regions in India
13. Eco-physiology and productivity of Groundnut in ICAR-AICRP system
14. Development of sucrose-probe for measuring drought tolerance in Rice
15. Photosynthesis and productivity of crop plants
16. Handling various National and International Research Projects on crops productivity
17. Working experience in Seed and Seedling Bank for Agroforestry
18. Survey and collection of seeds of crop plants in Garhwal Himalayas
19. Conservation of Biodiversity in Himalayan Region

Employment in ICAR

Employer	Designation/Place	Period	Scale (New Scales)
ICAR	Scientist	Jan 1985-Jan 1990	Rs. 15600-39100 (Grade pay: 6000)
ICAR	Scientist (SS)	Jan 1990- Dec 1995	Rs. 15600-39100 (Grade pay: 7000)
ICAR	Senior Scientist	Jan 1996- Sept 2005	Rs. 37,400-67,000 (Grade pay 9000)
ICAR	Principal Scientist (Selected by ASRB)	Sept 2005- June 2017	Rs. 37,400-67,000 (Grade pay 10,000)

Awards National/International

1. **Visiting Fellow ICRISAT**, Asia Centre, Patancheru, Hyderabad, 2000.
2. **AAA Senior**, conferred by the Indian Society for Plant Physiology, 2001.
3. **JIRCAS Visiting Fellowship** at Tropical Research Station, Ishigaki, Okinawa, Japan, 2002-03.
4. **Best Paper Reviewer Award** by **Field Crop Research**, Elsevier Publisher Editorial Board for the year 2016.

Institutional Administration

1. **Principal Investigator:** AICRP-NSP (Crops) Seed Physiology, Seed Germination, Testing and Storage 2013-17 (ICAR).
2. **Chairman,** Store Purchase & Advisory Committee, ICAR-DGR, Junagadh
3. **Chairman HRD Committee,** ICAR-DGR, Junagadh
4. **Vigilance Officer,** ICAR-DGR, Junagadh
5. **Chairman Hindi Committee,** ICAR-DGR, Junagadh
6. **Chairman** Store Purchase & Advisory Committee (at Division level) ICAR-IARI, New Delhi
7. **Chairman Sport Committee,** ICAR-DGR, Junagadh
8. **Director,** (*incharge*) ICAR-DGR, as and when required
9. **Head,** ICAR-IARI-WTC (*incharge*) as and when required
10. **Member,** Scientific Programme Committee National Seminar on Groundnut, Organized by DGR, Junagadh, 2004.
11. **Member National Organising Committee,** National Seminar of Plant Physiology, Junagadh, Gujarat 2013.
12. **Member, National Organising Committee,** ISST, National Seed Seminar, Bangaluru. 2013.
13. **Member Publication Committee,** National Seed Seminar held at **ICAR-IARI,** January 2017.
14. **Course co-ordinator** for training on Seed Production and Quality evaluation, February 18-28, 2015. Division of Seed Science and Technology, ICAR-IARI, New Delhi-110012, pp-275.

Teaching Experience

1. Total **11** years at various Universities and Institutions (Teaching + Research is **40** years):
 - i. HNB Garhwal University
 - ii. Junagadh Agricultural University, Junagadh, Gujarat
 - iii. Anand Agricultural University, Anand, Gujarat
 - iv. Himgiri Zee University, Dehradun
 - v. ICAR-IARI, New Delhi
 - vi. ICAR-DGR, Junagadh, Gujarat
 - vii. JBIT and Sai Inst. (Sri Dev Suman University).
2. Sai Institute: Dean Agro-Sciences, and teaching UG and PG Classes.
3. i. UG: Human values and Ethics, Plant Physiology, Bioinformatics, Seed Science and Technology
ii. PG: All subject in Agronomy and thesis work
4. **Visiting professor** (Agricultural Sciences) the **HIMALAYA** University, Dehradun.
5. **Member** on committee for implementation of **New Education Policy** in HNB Garhwal University.
6. **Delivered special lectures in the field of Agriculture and Forestry**

1. HNB Garhwal University	2
2. Graphic Era Deemed University	3
3. Graphic Era Hill University	1
4. Maya Group of Colleges	1

5. Popular article published during past two years

Published two popular articles in the News Paper on sustainable Agriculture in the Hill-Agro-eco system.



Research Publications

1.Types of publications	Total number
Research papers (refereed journals)	62
Popular articles	30
Book Chapters	10
Others (teaching manuals/Ext. Bulletins/e-resource etc.)	1
Seminar/Symposium	40
Compendium	1
Technical Bulletins	4

(For details please see list of publication, annexed)

2. Number of students guided: MSc/PhD: MSc: 5 Ph. D: 1

Reviewer of the Scientific Journals

1. Indian Journal of Plant Physiology (*current*)
2. Indian Journal of Agricultural Sciences (*current*)
3. Field Crop Research (*past*)
4. Journal of Agronomy and Crop Sciences -do-
5. Current Sciences -do-
6. Grana Itali) -do-

7. Brazil Journal of Botany
8. Indian Journal of Experimental Biology
9. Plant Signalling and Behaviour
10. Physiologia Planctarum
11. Environmental and Experimental Botany
12. Indian Journal of Plant Genetic Resources
13. Indian Journal of Genetics and Plant Breeding, Seed Research
14. Indian Journal of Experimental Biology

Special Assignments

1. **FAO**, Water Report (No. 22): Invited Article on “Irrigation management to enhance groundnut productivity during summer season” in 2002.
2. **FAO**, *fao.org*. Agri/post- harvest/ **compendium**/ groundnut. No. of Chapters 6, number of pages 163. 2003, *FAO web-site*. Compendium on “Groundnut- Postharvest in Developing Countries”

Academic Visits Abroad

1. **Kinki University**, Japan, Attend National Seminar, 2003.
2. **4th International Congress of Crop Science**, Participated in, Brisbane, Australia in 2004.
3. **University of Nottingham**, UK, Platform presentation of research paper on Bambara groundnut, 2008.
4. **University of Stellenbosch**, South Africa, Invited for talk on drought tolerance in Bambara groundnut and its scope for cultivation in India in a workshop on water requirement of **minor millets** and other underutilized crops at 2009.
5. **University of Stellenbosch**, South Africa, Platform presentation on water use efficiency in groundnut in Combined Congress of Agricultural Sciences 2009.

Research Project Management and Funds Mobilized

Assignment	Period	Project Title	Funds Allotted (Rupees in lakhs)
Co- PI	1993-1996	Selection for Water Use Efficiency in Grain Legume i(ACIAR-ICAR- ICRISAT) collaborative programme	23.0
Principal Investigator (PI)	1995-1997	High temperature tolerance in groundnut (NF BSFARA)	18.0
PI	2006-2009	Molecular, Environmental and Nutritional Evaluation of Bambara Groundnut for Food Production in Semi-arid Africa and India “ <i>BAMLINK</i> ”. EU Funded in collaboration with Univ. of Nottingham, UK	50.0
PI	2007-2010	Farmer’s Participatory Groundnut Improvement in Rainfed Cropping System (ISOPM).	98.0

PI	2009-2012	Evaluation of Groundnut Germplasm for Morphological, Physiological and Molecular Characters/traits Associated with Drought Tolerance for Enhancing Productivity in Rain-dependent System. (ICAR-NF BSFARA)	123.0
PI	2014-2016	Development of Sucrose-Sensors for Phenotyping of Soil Moisture-deficit Stress Tolerance in Rice (NF BSFARA).	234.0

RESEARCH REPORTS

1. Nautiyal, P.C., 1989: Standardization of drying methods for groundnut to prevent loss of seed viability. Activity Milestone: Post-harvest Technology, Under Micromission-I, on Crop Production Technology of Technology Mission on Oilseeds Production (ICAR).
2. Ravindra, V., S. Vasantha, Y.C. Joshi, P.C. Nautiyal and A.L. Singh, 1990: To develop ideotype concept and to identify genotypes with high physiological efficiency for high productivity in Spanish bunch and virginia runner forms of groundnut. *ibid*.
3. Nautiyal, P.C., and Y.C. Joshi, 1993-94: Selection for water use efficiency and partitioning in groundnut, A collaborative research project of ACIAR-ICRISAT-ICAR.
4. Nautiyal, P.C. 2005. Physiological studies on high temperature tolerance in groundnut- Final Progress Report (2002-2004), NATP-CGP, New Delhi.
5. Misra, J.B., P.C. Nautiyal and T. Radhakrishnan. 2009. ISOPOM Project: Farmers participatory groundnut improvement in rain-fed cropping systems (ISOPOM Ministry of Agriculture Govt. of India, New Delhi).
6. A survey of Anantpur and adjoining districts of Andhra Pradesh for the assessment of poor yield in 2008 *kharif* season. Submitted to the ANGRU, Hyderabad.
7. Organized a brain storming session on soybean seed longevity: molecular approach, Seed Science and Technology Division, IARI, Nov 9, 2012.
8. Phenotyping of rice genotypes for drought tolerance by developing sucrose sensor, ICAR-National Fund Project, Division of Seed Science and Technology, ICAR-IARI, New Delhi. Final report submitted, 2013-2016.

Ten Best Publications

1. **Nautiyal, P.C.** and A. N. Purohit, 1980. Berberine contents and alkaloid profile of *Berberis* species from different altitudes. *Biochemical Systematics and Ecology*, 8:379-380 (NAAS rating: **8.30**).
2. **Nautiyal, P.C.** and Ravindra, V. 1996. Drying and storage method to prolong seed viability and seedling vigour of rabi-summer-produced groundnut. *Journal of Agronomy and Crop Science*, 177: 123-128 (NAAS rating: **8.57**).
3. **Nautiyal, P.C.** V. Ravindra, P.V. Zala and Y.C. Joshi, 1999. Enhancement of yield in groundnut following the imposition of transient soil-moisture-deficit stress during the vegetative phase. *Experimental Agriculture*, Vol. 35, pp. 371-385 (NAAS rating **7.0**).
2. Bandyopadhyay, A., **P. C. Nautiyal**, T. Radhakrishnan, and H. K. Gor, 1999. Role of testa, cotyledons and embryonic axis in seed dormancy of groundnut (*Arachis hypogaea* L.). *Journal of Agronomy and Crop Science*, 182: 37-41 (NAAS rating: **8.57**).
3. **Nautiyal, P.C.**, A. Bandyopadhyay and P.V. Zala, 2001. In situ sprouting and regulation of fresh seed dormancy in Spanish type groundnut

- (*Archishypogaea L.ssp.fastigiata var.vulgaris*). *Field Crop Research*, 70: 233-241 (NAAS rating: **8.93**).
4. **Nautiyal, P.C.**, Nageswara Rao Rachaputi and Y.C. Joshi, 2002. Moisture-deficit induced changes in leaf-water content, leaf carbon exchange rate and biomass production in groundnut cultivars differing in specific leaf area, *Field Crop Research* 74: 67-79 (NAAS rating: **8.93**).
 5. **Nautiyal, P.C.** Rajgopal, K. P.V. Zala, Dipti S. Pujari, Manojit Basu, Bhuwaneshwariba Dhadhal and Bharat M. Nandre, 2008. Evaluation of wild *Arachis* species for abiotic stress tolerance: I Thermal stress and leaf water relations. *Euphytica*, 159:43-57 (NAAS rating: **7.62**).
 6. **Nautiyal, P.C.** 2009. Seed and seedling vigour traits in groundnut (*Arachishypogaea L.*). *Seed Science and Technology*, 37: 721-735 (NAAS rating: **6.52**).
 7. **Nautiyal, P.C.**, Ravindra V, Rathnakumar, A.L., Ajay, B.C. and Zala, P.V. 2012. Genetic variation in photosynthetic rate, pod yield and yield components in Spanish groundnut cultivars during three cropping seasons. *Field Crop Research*, 125:83-89 (NAAS rating: **8.93**).
 10. **Nautiyal, P. C.**, Rathnakumar, A. L., Ganesh Kulkarni and Shashshayee, S. 2017. Evaluation of wild *Arachis* species for cultivation under semiarid tropics as a fodder crop: *Photosynthetica*, 55 (1): 41-49 (NAAS rating: **7.56**).

DETAILED LIST OF PUBLICATIONS

A. REFERRED JOURNALS (National & International)

1. Nautiyal, P.C. and A. N. Purohit, 1980. Berberine contents and alkaloid profile of *Berberis* species from different altitudes. *Biochemical Systematics and Ecology*, 8:379-380.
2. Gaur, R.D., S. Nautiyal and P.C. Nautiyal, 1982. Study on weeds of *Eleusine* fields in relation to soil nature. *Indian Forester*, 108:708-711.
3. Khanduri, S.K., P.C. Nautiyal and A.N. Purohit, 1982. Allelopathic effects of *Berberis* fruit pulp leachate on germination of some crop plants. *Proceedings of Indian National Science Academy*, 1348:694-698.
4. Nautiyal, P.C. and N.P. Todaria, 1983. Maturation and ripening of three species of *Berberis* from different altitudes. *Scientia Horticulturae*, 19:91-95.
5. Sharma, M.P., P.C. Nautiyal and R.D. Gaur, 1983. *Hydenia murescens* keisel-A new fungus recorded from India. *Indian Phyto-Pathology*, 36:307-388.
6. Nautiyal, P.C. and N.P. Todaria, 1984. Leaf pigmentation in *Berberis* species from different altitudes. *Photosynthetica*, 18:414-417.
7. Nautiyal, S, P. C. Nautiyal and R.D. Gaur, 1984. Studies on weeds of Barley fields in Garhwal, Srinagar. *Himalayan Research and Development*, 1:21-22.
8. Nautiyal, P.C., and P.P. Dhyani, 1986. Variation in water vapour transfer and energy exchange in naturally growing sun and shade loving *Berberis* species at different altitudes. *Indian Journal of Forestry*, 9:337-342.
9. Nautiyal, P. C. and A. N. Purohit, 1986. Effect of auxin on seasonal rooting response of stem cuttings of *Berberis* from different altitudes. *Indian Journal of Plant Physiology*, 29:286-290.
10. Dwivedi, R.S., Y.C. Joshi, P.C. Nautiyal, A.L. Singh, V. Ravindra, A.N. Thakkar, V.G. Koradia and G.S. Dhapwal, 1986. Detection of drought resistance in peanut (*Arachis hypogaea L.*). *Oleagineux*, 41:281-285.

11. Nautiyal, P.C., S. Vasantha, S. K. Suneja and A. N. Thakkar, 1988. Physiological and biochemical attributes associated with the loss of seed viability and vigour in groundnut (*Arachis hypogaea* L.). *Oleagineux*, 43:459-462.
12. Joshi, Y.C., P.C. Nautiyal, V. Ravindra and R.S. Dwivedi, 1988. Water relations in two cultivars of groundnut (*Arachis hypogaea* L.) under soil water deficit. *Tropical Agriculture*, 65:182-184.
13. Nautiyal, P.C. V. Ravindra and Y.C. Joshi, 1989. Varietal and seasonal variation in seed viability among Spanish groundnut (*Arachis hypogaea* L.). *Indian Journal of Agriculture Sciences*, 60:143-145.
14. Nautiyal, P.C., and A.N. Purohit, 1989. Distribution pattern and seed germination behavior of *Berberis* species in Garhwal Himalaya. *Journal of Indian Botanical Society*, 68:181-183.
15. Ravindra, V, P.C. Nautiyal & Y.C. Joshi, 1990. Physiological analysis of drought resistance and yield in groundnut (*Arachis hypogaea* L.) *Tropical Agriculture*, 67:290-296.
16. Nautiyal, P.C. and Y.C. Joshi, 1991. Storage of Rabi/summer groundnut (*Arachis hypogaea* L.) with calcium chloride for prolonged seed viability and vigour. *Tropical Science*, 31:21-26.
17. Nautiyal, P.C., and P.V. Zala, 1991. Effect of drying methods on seed viability and seedling vigour in spanish groundnut (*Arachis hypogaea* L.). *Seed Science and Technology*, 19:451-459.
18. Nautiyal, P. C., Y.C. Joshi and P.V. Zala, 1991. A storage method to prolong seed viability in groundnut. *International Arachis Newsletter*, 9:21-22.
19. Nautiyal, P. C., V. Ravindra, S. Vasantha and Y.C. Joshi, 1991. Physiological and biochemical basis for viability difference in spanish groundnut in response to soil moisture stress. *Oleagineux*, 46:153-158.
20. Nautiyal, P.C., A. Bandyopadhyay and V. Ravindra, 1993. Problems with defining seed dormancy characteristics of groundnut genotypes. *Journal of Oilseeds Research*, 10: 271-276.
21. Nautiyal, P. C., Joshi Y.C. and P.V. Zala, 1994. Screening of Spanish groundnut cultivars for germination under simulated drought stress. *International Arachis Newsletter*, 14: 22.
22. Misra, J.B., P. C. Nautiyal and Sheela Chauhan, 1994. Catabolism of oil and protein and biosynthesis of starch in the cotyledons of germinating seeds of groundnut. *Plant Physiology and Biochemistry*, 21: 18-21.
23. Nautiyal, P. C., Y.C. Joshi and V. Ravindra, 1994. Responses of groundnut (*Arachis hypogaea* L.) genotypes to salinity. *Bio-science Research Bulletin*, 10: 59-62.
24. Misra, J. B., Nautiyal, P. C., Ravindra, V., and Yadav, S.K., 1995. Diurnal variation in photosynthesis and activities of enzymes of sucrose metabolism in groundnut leaves. *Plant Physiology and Biochemistry*, vol. 22: 187-191.
25. Ravindra, V., Nautiyal, P. C. and Y. C. Joshi, 1995. Ontogenetic changes in growth and net photosynthetic rate of two peanut (*Arachis hypogaea* L.) cultivars. *Biologia Plantarum*, 37: 225-232.
26. Nautiyal, P.C., V. Ravindra and Y.C. Joshi, 1995. Gas exchange and leaf water relations in two penut cultivars of different drought tolerance. *Biologia Plantarum* 37: 371-374.
27. Nautiyal, P.C., Y.C. Joshi and P.V. Zala, 1996. A storage method to prolong seed viability in groundnut (*Arachis hypogaea* L.). *Agriculture and Equipment International*, 48: 3-4.
28. Nautiyal, P.C. and Ravindra, V. 1996. Drying and storage method to prolong seed viability and seedling vigour of rabi-summer-produced groundnut. *Journal of Agronomy and Crop Science*, 177: 123-128.
29. Joshi, Y.C., P. C. Nautiyal and V. Ravindra, 1996. Screening for cold tolerance and osmoconditioning to enhance germination of groundnut in suboptimal temperatures. *Tropical Science*, 36: 224-228.

30. Nautiyal, P.C., V. Ravindra, and J.B. Misra, 1997. Response of dormant and non-dormant seeds of groundnut (*Arachis hypogaea* L.) genotypes to accelerated ageing. *Indian Journal of Agricultural Sciences*, 67: 67-70.
31. Singh, A. L., P.C. Nautiyal & P. V. Zala, 1998. Growth and yield of groundnut varieties as influenced by seed size. *Tropical Science*, 38: 48-56.
32. Nautiyal, P.C., V. Ravindra and Y.C. Joshi, 1989. Germination and early seedling growth of some groundnut (*Arachis hypogaea* L.) cultivars under salt stress. *Indian Journal of Plant Physiology*, 32:251-253.
33. Nautiyal, P. C., V. Ravindra, and Y. C. Joshi, 1999. Net photosynthetic rate in peanut (*Arachis hypogaea* L.): Influence of leaf position, time of day, and reproductive-sink. *Photosynthetica*, 36: 129-138.
34. Nautiyal, P.C. V.Ravindra, P.V. Zala and Y.C. Joshi, 1999. Enhancement of yield in groundnut following the imposition of transient soil-moisture-deficit stress during the vegetative phase. *Experimental Agriculture*, Vol. 35, pp. 371-385.
35. Bandyopadhyay, A., P. C. Nautiyal, T. Radhakrishnan, and H. K. Gor, 1999. Role of testa, cotyledons and embryonic axis in seed dormancy of groundnut (*Arachis hypogaea* L.). *Journal of Agronomy and Crop Science*, 182: 37-41.
36. Nautiyal, P. C., A. Bandyopadhyay, V.G. Koradia and Madhubhai Mankad, 2000. Performance of groundnut germplasm and cultivars under saline water irrigation in the soil of Mundra in Gujarat, India. *International Arachis Newsletter*, 20: 80-82.
37. Nautiyal, P.C., A. Bandyopadhyay and P.V. Zala, 2001. In situ sprouting and regulation of fresh seed dormancy in Spanish type groundnut (*Arachis hypogaea* L.ssp.fastigiata var.vulgaris). *Field Crop Research*, 70: 233-241.
38. Nautiyal, P.C. V. Ravindra and P.V. Zala, 2001. A new method for drying groundnut pods for better seed storability, *International Arachis Newsletter*, 21: 26-30.
39. Nautiyal, P. C., V. Ravindra and Y.C. Joshi, 2002. Dry matter partitioning and water use efficiency under water-deficit during various growth stages in groundnut, *Indian Journal of Plant Physiology*, 7:135-137.
40. Nautiyal, P.C., Nageswara Rao Rachaputi and Y.C. Joshi, 2002. Moisture-deficit induced changes in leaf-water content, leaf carbon exchange rate and biomass production in groundnut cultivars differing in specific leaf area, *Field Crop Research* 74: 67-79.
41. Nautiyal, P.C., T. B. Bhanushali and Vijay Prakash, 2002. Performance of groundnut germplasm at high temperature during the reproductive phase in Rajasthan, India. *International Arachis Newsletter*, 22: 18-20.
42. Nautiyal, P.C., Y.C. Joshi and Devi Dayal, 2002. Response of groundnut to deficit irrigation during vegetative growth. *FAO, Water Report*, 22: 39-46.
43. Nautiyal, P. C., A. Bandyopadhyay and R.C. Misra. 2004. Drying and storage method to prolong seed viability of summer groundnut (*Arachis hypogaea* L.) in Orissa, *Indian Journal of Agricultural Sciences*. 74: 316-320.
44. Nautiyal, P. C. and P. V. Zala, 2004. Influence of drying methods and temperatures on germinability and vigour of groundnut (*Arachis hypogaea* L.) seed harvested in summer season, *Indian Journal of Agricultural Sciences*, 74 : 588-93.
45. Misra, J. B. and Nautiyal, P.C., 2005. Influence of imposition of soil moisture-deficit-stress on some quality components of groundnut, *Journal of Oilseeds Research*, 22:119-124.
46. Nautiyal, P. C. and Misra, J.B., 2005. Effect of drying methods on seed germination and seed-protein profile in groundnut, *Journal of Oilseeds Research*, 22:125-128.
47. Nautiyal, P. C., Mariko Shono and Yoshinobu Egawa, 2005. Enhanced thermotolerance of the Vegetative parts of MT-sHSP transgenic tomato lines, *Scientia Horticulturae* 105: 393-409.

48. Rukam Singh, Deepak Issar, P.V. Zala and P.C. Nautiyal, 2007. Variation in sensitivity to salinity in groundnut cultivars during seed germination and early seedling growth. *Journal of SAT Agricultural Research* 5: 1-7.
49. Nautiyal, P.C. Rajgopal, K. P.V. Zala, Dipti S. Pujari, Manojit Basu, Bhuwaneshwariba Dhadhal and Bharat M. Nandre, 2008. Evaluation of Wild *Arachis* species for abiotic stress tolerance: I Thermal stress and leaf water relations. *Euphytica*, 159:43-57.
50. Nautiyal, P. C. and Ganesh Kulkarni 2009. Seed SDS-PAGE protein profile in dormant and non-dormant types of groundnut (*Arachis hypogaea*) cultivars. *Indian Journal of Agricultural Sciences*, 79:476-478.
51. Nautiyal, P.C. 2009. Seed and seedling vigour traits in groundnut (*Arachis hypogaea* L.). *Seed Science and Technology*, 37: 721-735.
52. Nautiyal, P.C. and Mariko Shono, 2010. Analysis of the role of mitochondrial and endoplasmic reticulum localized small heat-shock proteins in tomato (*Lycopersicon esculentum* Mill.) plant. *Biologia Plantarum*, 54 (4):715-719.
53. Nautiyal, P. C., Zala, P.V., Rukam Singh, Paresh Sodavadiya, and Bhavesh Tavethia, 2011. A Evaluation of water use efficient new developed varieties of groundnut in on-farm trials in two different rain-fall areas in Gujarat, *Journal of SAT Agricultural Research*, December 2011, Vol 9:1-6.
54. Nautiyal, P.C., J.B. Misra and P.V. Zala, 2010. Influence of seed maturity stages on germinability and seedling vigour in groundnut. *Journal of SAT Agricultural Research* 8: 1-8.
55. Nautiyal, P.C., Ravindra V, Rathnakumar, A.L., Ajay, B.C. and Zala, P.V. 2012. Genetic variation in photosynthetic rate, pod yield and yield components in Spanish groundnut cultivars during three cropping seasons. *Field Crop Research*, 125:83-89.
56. Parihar, S. S., M. Dadlani, S. K. Lal, V.A. Tonapi, P.C. Nautiyal and S. Basu 2014. Effect of seed moisture content and storage temperature on seed longevity of hemp (*Cannabis sativa* L.). 84(11): 1303-9, *Indian Journal of Agricultural Sciences*.
57. Neeta Dwivedi, Kalpana Singh, P. C. Nautiyal, S. Goel and K.G. Rosin, 2016. Differential response of antioxidant enzymes to water-deficit stress in maize (*Zea mays* L.) hybrids during two leaf stage *Indian Journal of Agricultural Sciences*, 86 (6):732-7.
58. Nautiyal, P. C., Rathnakumar, A. L., Ganesh Kulkarni and Shashshayee, S. 2017. Evaluation of wild *Arachis* species for cultivation under semiarid tropics as a fodder crop (On line published May 2016: *Photosynthetica*, 55 (1): 41-49, 2017.
59. Neeta Dwivedi, P.C. Nautiyal, Kalpana Singh, Ishwar Singh, 2016. Evaluation of maize hybrids for leaf thermostability, photosynthetic rate, stems reserves and productivity, under rain-dependent conditions. *Indian Journal of Agricultural Sciences* 86 (11): 55-61.
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