

Print ISSN : 0972-8813
e-ISSN : 2582-2780

[Vol. 20(2), May-August, 2022]

Pantnagar Journal of Research

(Formerly International Journal of Basic and
Applied Agricultural Research ISSN : 2349-8765)



G.B. Pant University of Agriculture & Technology, Pantnagar



CONTENTS

Mapping rice residue burning in Punjab state using Satellite Remote Sensing MANISHA TAMTA, VINAY KUMAR SEHGAL and HIMANI BISHT	184
Plumule colouration as a criterion to improve the efficiency of R1-nj marker based doubled haploid breeding in maize PRABHAT SINGH, MUKESH KUMAR KARNWAL, SMRUTISHREE SAHOO, ARVIND CHAUHAN and NARENDRA KUMAR	192
Effect of nitrogen scheduling on fodder yield, quality and economics of multi cut fodder oat (<i>Avena sativa L.</i>) SONAL SAKLANI and MAHENDRA SINGH PAL	199
Prediction of above ground biomass in <i>Dendrocalamus hamiltonii</i> using multiple linear regression in Uttarakhand state of India ANJULI AGARWAL	204
Soil micronutrient availability as influenced by monosaccharide distribution in cultivated farm land, Nigeria A. O. BAKARE, I. U. EFENU DU and I. P. EGHAREVBA	209
Laboratory evaluation of Dashparni extract against bollworm complex of cotton RACHNA PANDE, RAMKRUSHNA GI, NEELKANTH HIREMANI and SUNITA CHAUHAN	216
Long term efficacy of seven essential oils against <i>Sitophilus oryzae</i> (Linnaeus), <i>Rhizopertha dominica</i> (Fabricius) and <i>Tribolium castaneum</i> (Herbst) DEEPA KUMARI and S. N. TIWARI	221
Effect of some fungicides on Alternaria leaf blight disease and yield of mustard A.K. TEWARI, K.S. BISHT and POOJA UPADHYAY	229
Effective management strategies for sheath blight disease of barnyard millet (<i>Echinochloa crusgalli L.</i>) incited by <i>Rhizoctonia solani</i> in hills of Uttarakhand LAXMI RAWAT, AKANSHU, SUMIT CHAUHAN, POOJA BAHUGUNA, ASHISH TARIYAL and AJAY MAMGAIN	234
Comparative studies of the effect of microbial inoculants and inorganic chemicals on growth, yield, yield contributing traits and disease suppression in two varieties of mustard green (<i>Brassica juncea L.</i>) under open field conditions in mid hills of Uttarakhand MONIKA RAWAT, LAXMI RAWAT, T. S. BISHT, SUMIT CHAUHAN, POOJA BAHUGUNA and AJAY MAMGAIN	247
Effect of different varieties of <i>Raphanus sativus</i> as bio-fumigants and microbial biocontrol agents for the management of <i>Pythium aphanidermatum</i> causing damping off in tomato MANJARI NEGI, ROOPALI SHARMA, ARCHANA NEGI and BHUPESH CHANDRA KABDWAL	258
The impact of the school vegetable garden on vegetable consumption among students AJIT, T.G. ELDHO. P. S and MERCYKUTTY, M.J.	264

Comparative analysis of schools on student's attitude, knowledge level and perceived effectiveness on school vegetable garden	269
AJIT, T.G., ELDHO. P. S and MERCYKUTTY, M.J.	
Prevalence of sick buildings in Uttarkashi District of Uttarakhand	274
NIDHI PARMAR	
Awareness and prevalence of hypertension among educated Indians with internet access during COVID-19 and associated risk factors	284
NIDHI JOSHI, RITA SINGH RAGHUVANSHI and ANURADHA DUTTA	
Prevalent sun protection practices among college going girls	297
BEENU SINGH and MANISHA GAHLOT	
A study on productive and reproductive management practices of dairy animals in district Varanasi of Uttar Pradesh	302
AMAR CHAUDHARI, RISHABH SINGH and PUSHP RAJ SHIVAHRE	
Nucleocapsid Segment Sequence based phylogenetic analysis of different strains of Crimean Congo Haemorrhagic fever virus encountered in India over last decade	307
AMAN KAMBOJ, SHAURYA DUMKA and CHINMAY GUPTA	
Rabies meta-analysis in dogs and human	312
A. K. UPADHYAY, R. S. CHAUHAN, MAANSI, N. K. SINGH and S. SWAMI	
Nanosilica induced pathological changes in Wistar rats	316
NEHA, MUNISH BATRA and R.S. CHAUHAN	
Emerging and re-emerging zoonoses of India originating from dogs and cats	324
SOURABH SWAMI and AJAY KUMAR UPADHYAY	
Assessment of physiological characteristics and effect of load on agricultural workers during cranking operation	328
SWEETI KUMARI, V.K.TEWARI and SANJEEV KUMAR	
Sensitivity analysis of breach width parameter of Ramganga dam, using 2D HEC-RAS	335
PRANAV SINGH, JYOTHI PRASAD and H. J. SHIVA PRASAD	
Parametric optimization of friction stir welding for electrical conductivity of aluminium joints using ANN approach	341
MANEESH TEWARI, R.S. JADOUN and DEVAKI NANDAN	
Length-weight relationship and condition factor of four fishes of the Family Trichiuridae south west and east coast of India	346
CHITRA M.C. and M.K. SAJEEVAN	
Effectiveness of instructional material on gain in knowledge of rural women	351
PREMLATA, DHRITI SOLANKI and RAJSHREE UPADHYAY	
An updated checklist of planktonic Copepods from the major estuaries of Kerala (Vembanad and Ashtamudi), south-west coast of India	356
HANI P.M. and JAYALAKSHMI K.J	
Proximate composition of Bengal Corvina, <i>Daysciaena albida</i> (Cuvier 1830) from Vembanad lake	367
KITTY FRANCIS C. and M. K. SAJEEVAN	

Prevalent sun protection practices among college going girls

BEENU SINGH and MANISHA GAHLOT

Department of Clothing and Textiles, College of Home Science, G. B. Pant University of Agriculture and Technology, Pantnagar-263145 (U.S. Nagar, Uttarakhand)

ABSTRACT: An increase in outdoor activities and habits of humans have resulted in greater exposure to solar radiation. Changing life style practices and sun protection behavior offer a challenge. The occurrence of skin problems has been rising worldwide due to excessive exposure to sunlight. Because of the rise in skin cancer, the risks associated with exposure to sun are a big deal of concern for the individuals to protect themselves. There is a need for effective interventions targeting females particularly in warmer climates where appropriate sun protection remains a year-round concern. The sun-protection attitude of young people is particularly important because their clothing habits are fashion driven and they focus less on protective aspects of clothing. Therefore, the current study was designed to explore the prevalent sun protection practices followed by college going girls in which study revealed that only few no. of respondents was aware of the availability of textile related sun protection products in markets. Therefore, more textile-based sun protection products can be designed and developed.

Key words: Prevalent sun protection practices, Sun protection behavior, Skin problems,

Sun is a major power to shape life on earth. Sunlight is an electromagnetic energy, which is disseminated by electromagnetic waves. Solar UV undergoes significant absorption by the atmosphere, but due to the depletion of ozone layer in atmosphere, the phototoxic effects of sunlight are of great concern for human all over the world. The depletion of stratospheric ozone layer, result in exposure of people and environment to higher intensities of UV rays (Srinivasan and Gatewood, 2000).

An increase in outdoor activities and habits of humans may also result in greater exposure to solar radiation. Sunburn and tanning are the best-known acute effects of excessive solar UV radiation exposure; in the long term, UV radiation may induce degenerative changes in cells, fibrous tissue and blood vessels leading to premature skin ageing (Yallambie, 2003). Human exposure to solar ultraviolet radiation has chief implications on health of the people. Many studies revealed that greater exposure to UV radiation is associated with different types of sunburn, skin cancer, accelerated skin ageing and reduced effectiveness of the immune system, cataract and other diseases related to eye (Korkina *et al.*, 2018).

As the ozone layer in the atmosphere is continuously becoming thinner, global warming is increasing and more damaging radiations are reaching the earth's surface, therefore more effective protection against solar radiation will be required to protect the people. The intensity of solar ultraviolet radiations depends on the height of the

sun in the sky. This will vary depending on the season of the year, time of day and latitude (Diffey, 1991).

Overexposure in a day can lead to sunburn and tanning. It takes only one sunburn to double the risk of skin cancer on all skin types. UV radiation is a known carcinogen (Roberts, 2001). Therefore, precaution must be taken when exposed to these types of energy to protect and defend against long-lasting effects. Covering the skin is the best way to reduce the risk of tanning to a great extent and also protects skin from direct sun. That can be done either with the application of sunscreen lotions or by covering the exposed parts of body with some fabric.

Personal appearance is considered very important especially by women. Both good health and clear skin contribute to appearance. Teenage and young females are more conscious of their appearance than other age groups as they are influenced by fashion and media portrayals of attractiveness. Changing life style practices and sun protection behavior offer a challenge. There is a need for effective interventions targeting females particularly in warmer climates where appropriate sun protection remains a year round concern. The sun-protection attitude of young people is particularly important because their clothing habits are fashion driven and they focus less on protective aspects of clothing.

The occurrence of skin problems has been rising worldwide due to excessive exposure to sunlight. Because

of the rise in skin cancer, the risks associated with exposure to sun are a big deal of concern for the individuals to protect themselves. Consumer’s changing behavior and attitude for sun protection are instrumental to increase in demand for sun protective products. Hence, there is a need to know the prevalent sun protection practices among college going girls.

Therefore, the current study was designed to explore the sun protection practices followed by college going girls. Under the study investigation of prevalent practices of college going girls related to sun protection was carried out.

MATERIALS AND METHODS

Selection of Respondents

The female students pursuing the Undergraduate, M.Sc. and Ph.D. degree programmes in the university were selected as the respondents for the present study. Total 60 respondents were selected randomly. A simple random sampling was used for the selection of respondents.

Formulation of interview schedule

Interview schedule was formulated for collecting information on use of sun protective measures by female university students including the style of garment preferred while going out, effect observed due to over exposure in sunlight, protection of which body part was most often taken, protective measures taken while going out, factors related to sunscreen etc.

Collection of data

Personal interview method was used for collecting information using interview schedule for the study. Details and reasons were also noted wherever required.

Weighted mean score

According to Agarwal (2006), the weighted mean score was computed during the analysis of the data to calculate the order of preference of the respondents for a given parameter. Mean score of each category was worked out separately and weighted mean score was calculated by following formula:

$$X = \frac{w_1 X_1 + w_2 X_2 + \dots + w_k X_k}{w_1 + w_2 + \dots + w_k}$$

where,

w_1, w_2, \dots, w_k are the frequencies

X_1, X_2, \dots, X_k are the scores (1,2,3,4,5.....n)

WMS was calculated for the assessment of designs and sun protective clothing based on the ratings given by the respondents for different parameters.

Frequency

Number of times a variate value is repeated is called frequency of variate value (Agarwal, 2006).

Percentage

The percentage values were used for simple comparison of different parameters in the present work. It was calculated by dividing the frequency of a particular cell by total number of respondents and multiplying by hundred (Agarwal, 2006).

$$P = \frac{n}{N} \times 100$$

Rank

Rank refers to the relative position, value, worth, complexity, power, importance, authority, level, etc. of a person or object within a ranking. In the present study use of rank was made during assessment of developed designs of sun protective clothing based on their WMS.

RESULTS AND DISCUSSION

Prevalent Sun Protection Practices Among Respondents

This study divulges the information regarding the use of sun protective measures among female university students including the effects observed due to over exposure in sunlight, protective measures used by them while going out and factors related to use of sunscreen and other items/ accessories for sun protection.

Number of hours spent in sunlight per day

Table 1 reveals that the most of the respondents (58.33%) spent 1-2 hours out in sunlight while 26.67 % of respondents spent more than 2 hours in sunlight and only 15 % of respondents spent less than 1 hour in a day. It was reported by the respondents that they did not get expose to sunlight continuously but it was the exposure time for whole day during different timings while commuting between hostel and college. Majority of the respondents tried to avoid sun during peak afternoon hours. They tried to confine themselves either at their respective colleges or hostels. They only went outside if it was required for attending classes or some other urgent work.

Table 1: Distribution of respondents on the basis of number of hours spent in a day in sunlight n=60

Sl. No.	No. of hours	Frequency	Percentage
1	Less than 1 hour	9	15.00
2	1-2 hours	35	58.33
3	More than 2 hours	16	26.67

Preference for garments

Table 2 illustrates the responses for the type of garment

respondents wore while going out. Maximum no. of respondents (91.67 %) preferred to wear jeans or trouser and top, followed by the respondents who preferred kurta suit set (8.33 %). Other options were long skirt/short skirt and top and capri, but none of the respondents gave their preference for these though they preferred to wear these garments within the hostel. The reasons given by respondents for wearing jeans and top were comfort, ease of wear, easy care and trendy look. Moreover, these garments also offered high cover to body in sun.

Table 2: Distribution of respondents according to type of garment they wore while going out n=60

Sl. No.	Type of garments	Frequency	Percentage
1	Kurta suit set	5	8.33
2	Jeans/Trouser and top	55	91.67

Colour of skin of respondents

It is evident from data given in Table 3 that 28.33 % respondents had fair and medium colour of skin each followed by 25 % of respondents who had wheatish colour complexion, 13.33 % were slightly dark, 3.33 % were dark. Only 1.67 % had very fair skin colour.

Table 3: Distribution of respondents according to colour of skin n=60

Sl. No.	Colour of skin	Frequency	Percentage
1	Very fair	1	1.67
2	Fair	17	28.33
3	Medium	17	28.33
4	Wheatish	15	25.00
5	Slightly dark	8	13.33
6	Dark	2	3.33

Effects observed due to over exposure in sunlight

As evident from Table 4 maximum no. of respondents (85 %) observed tanning, followed by 13.33 % who observed sunburn and 1.67 % respondents observed burning eyes as she had very fair skin which did not tan much. Thus, it can be visualized from data given in table that tanning was the most common phenomenon which was observed by the respondents.

Table 4: Distribution of respondents on the basis of effects they observed due to over exposure in sunlight n=60

Sl. No.	Effects	Frequency	Percentage
1	Tanning	51	85.00
2	Sunburn	8	13.33
3	Burning eyes	1	1.67

Level of tanning sunlight exposure

Table 5 reveals that the large no. of respondents (85.00

%) had noticeable tanning whereas 13.33 % had slight tanning and 1.67 % had negligible tanning. It provided a clear idea that tanning was the noticeable phenomenon among respondents which they observed after comparing the skin colour of exposed parts to that of colour of covered skin parts.

Table 5: Distribution of respondents on the basis of level of tanning faced by them n=60

Sl. No.	Level of tanning	Frequency	Percentage
1	Slight	8	13.33
2	Noticeable	51	85.00
3	Negligible	1	1.67

Protection against sunlight

The figures in Table 6 reveal that large majority of respondents (85 %) used to take sun protection in summers only while only 15 % of respondents reported that they used to take sun protective measures throughout the year.

Table 6: Distribution of respondents on the basis of season during which they take sun protection n=60

Sl. No.	Season	Frequency	Percentage
1	In summers only	51	85
2	Throughout the year	9	15

Protection of body parts taken most often

The data in Table 7 reveals that most of respondents (61.67 %) took protective measures for face, torso and arms while 35 % of respondents protected only their face. Very less no. of respondents i.e. 3.33 % took protection only of arms and hands. The figures in the table provide a clear idea that respondents were very conscious about their upper body parts which are more visible and noticeable, therefore they used to take protection of uncovered body parts which were not covered by the clothing. It was noted by the researcher that none of the respondents opted for the option for protection of legs and feet only as legs were covered completely by the lower garments and feet were less visible.

Table 7: Distribution of respondents on the basis of protection of body parts taken most often by them n=60

Sl. No.	Body parts	Frequency	Percentage
1	Face only	21	35.00
2	Arms and hands only	2	3.33
3	Face, torso and arms	37	61.67

Protective measures taken while going out

The protective measures taken by respondents while going out were assessed by collecting their responses on five-point scale for nine different sets of statements. The responses were tabulated to calculate the frequencies which

Table 8: Distribution of respondents on the basis of protective measures taken while going out (n= 60)

Sl. No.	Protective measures	Never (1)	Rarely (2)	Sometimes (3)	Often (4)	Always (5)	WMS	Rank
1	Use of sunscreen	3	1	2	39	15	4.03	III
2	Wearing a over shirt	52	8	-	-	-	1.33	VIII
3	Wearing a hat that shades your face, ears	7	53	-	-	-	1.88	VI
4	Using an umbrella	2	-	3	40	15	4.10	II
5	Tying scarf/stole around face and neck	-	-	-	43	17	4.28	I
6	Tying dupatta around face and neck	-	4	6	38	12	3.96	IV
7	Wearing full sleeve gloves	4	1	8	40	7	3.75	V
8	Wearing socks	29	16	15	-	-	1.76	VII

were then converted into the weighted mean scores (WMS). The rank was later assigned to each statement on the basis of their weighted mean scores. The details are shown in Table 8.

Table 8 depicts the data on type of protective measures used by the respondents while going out. It can be inferred from the data that tying of scarf/stole around face and neck was ranked I with the highest WMS 4.28. Hence it was the most preferred practice followed by the respondents for sun protection. The second and third most preferred protective measures taken by respondents were use of umbrella and sunscreen as depicted by WMS 4.10 and 4.03, respectively. Tying dupatta around face and neck and wearing full sleeve gloves were ranked IV and V with WMS 3.96 and 3.75, respectively. The least preferred protective measures were wearing a hat, wearing socks and wearing an over shirt as depicted by WMS 1.88, 1.76 and 1.33 respectively. Reasons for using scarf/stole as compared to dupatta were that scarf was easy to use, fold and carry being smaller in size than dupatta. Sunscreen and umbrella were easily available to the respondents and were portable.

Amount of sunscreen applied in a day while going outside

It can be deduced from the data given in Table 9 that majority of respondents (70 %) applied sunscreen optimally followed by 20 % respondents who applied it liberally and only 10 % respondents applied it in very less amount. Reason reported by the respondents to apply sunscreen liberally was their frequent movement in sun. For maximum protection they applied it liberally most of the time. Respondents who used to cover their face with scarf or stole applied it optimally or minimally.

Frequency of application of sunscreen

Table 10 reveals that most of respondents (71.67 %) applied sunscreen only once a day while 35 % applied it every two hours and only 3.33 % applied it each hour. It

Table 9: Distribution of respondents on the basis of amount of sunscreen applied while going out n=60

Sl. No.	Amount of sunscreen applied	Frequency	Percentage
1	Liberally	12	20
2	Optimally	42	70
3	Less	6	10

was noted by the researcher that the majority of respondents were not aware about the fact that effectiveness of sunscreen decreases with time and also due to sweat hence they applied it only once a day.

Table 10: Distribution of respondents on the basis of frequency of application of sunscreen n=60

Sl. No.	Frequency of application	Frequency	Percentage
1	Apply it once in a day	43	71.67
2	Apply it every two hours	15	25.00
3	Apply it each hour	2	3.33

Area of application of sunscreen

When the respondents were asked about the area of application of sunscreen, most of them (48.33%) stated that they applied it on face, neck, arms and hands followed by 26.67 % respondents who applied on face and neck portion. Only 25 % of the respondents applied on face only. The data makes it clear that the most of the respondents applied sunscreen on exposed body parts.

Table 11: Distribution of respondents on the basis of the area of application of sunscreen n=60

Sl. No.	Area of application	Frequency	Percentage
1	Face only	15	25.00
2	Face and neck	16	26.67
3	Face, neck, arms and hands	29	48.33

Factors affecting selection of sunscreen

The figures in Table 12 reveal that maximum no. of respondents selected sunscreen on the basis of SPF (51.67 %) followed by brand (10 %) and cost (6.66 %). Some of

the respondents (31.67 %) considered all the above factors while selecting the sunscreen.

Table 12: Distribution of respondents on the basis of factors affecting selection of sunscreen n=60

Sl. No.	Factors	Frequency	Percentage
1	Brand	6	10.00
2	Cost	4	6.66
3	SPF	31	51.67
4	All of the above	19	31.67

Level of SPF of sunscreen used

As evident from Table 13 that most of respondents (45.00 %) used SPF 20, followed by 41.67 % and 13.33 % of respondents who were using SPF of 15 and 30 respectively. Reasons for not using sunscreens of higher SPF was its higher cost according to the respondents who used to think that they get sufficient protection by the SPF of 15 to 20 according to their need and duration of exposure.

Table 13: Distribution of respondents on the basis of level of SPF used n=60

Sl. No.	Level of SPF	Frequency	Percentage
1	15	25	41.67
2	20	27	45.00
3	30	8	13.33

Preference for the form of sunscreen

When the respondents were asked about their preference for the form of sunscreen, majority of them preferred lotion/cream i.e., 75 % followed by 25 % of respondents who preferred gel type sunscreens. Researcher observed that respondents were not aware of different other types of sunscreens such as wipe and spray.

Table 14: Distribution of respondents on the basis of form of sunscreen preferred n=60

Sl. No.	Form of sunscreen	Frequency	Percentage
1	Gel	15	25
2	Lotion/ Cream	45	75

Discomfort faced on application of sunscreen

It is clear from the Table 15 that maximum no. of respondents (96.67 %) did not face any problem on application of sunscreen. Very few respondents i.e., 3.33 % faced discomfort on application of sunscreen. Discomfort faced by them were burning of eyes and itching on face.

Table 15: Distribution of respondents on the basis of discomfort faced on application of sunscreen n=60

Sl. No.	Response	Frequency	Percentage
1	Yes	2	3.33
2	No	58	96.67

CONCLUSION

It can be concluded from the results of this study that tanning was the common phenomenon which was observed by most of the respondents on exposure to sunlight and majority of the respondents had observed noticeable tanning. Most of the respondents were using sun protection measures while going out. Sun protective measures taken by them were tying stole/dupatta around face and application of sunscreen lotions. The study also revealed that very less no. of respondents was aware of the availability of textile related sun protection products in markets other than scarf and dupatta. Therefore, more textile-based sun protection products can be developed for the college and office going females who used to travel by cycle or two wheelers. Hence it can be envisioned on the basis of present study that there is scope as well as need, in the field of designing and development of sun protective clothing using different type of fabric and styles. Clothing provides more reliable protection and is easier to use. Woven fabrics can provide simple and convenient protection against harmful effects of UV radiation if the necessary attention is paid to their engineering in the phase of a new product development.

REFERENCES

- Agarwal, B. L. (2006). Basic Statistics. New Delhi: New Age International Publishers.
- Diffey, B. L. (1991). Solar ultraviolet radiation effects on biological systems. *Phys Med Biol*, 36: 299–328 [doi:10.1088/0031-9155/36/3/001].
- Korkina, L., Kostyuk, V., Potapovich, A., Mayer, W., Talib, N., and De Luca, C. (2018). Secondary plant metabolites for sun protective cosmetics: from pre-selection to product formulation. *Cosmetics*, 5(2): 32.
- Roberts J. (2001). Ocular phototoxicity. *J Photochem Photobiol B*, 64:136-43.
- Srinivasan, M., and Gatewood, B. M. (2000). Relationship of dye characteristics to UV protection provided by cotton fabric. *Textile Chemist and Colorist & American Dyestuff Reporter*, 32(4): 36-43
- Yallambie, V. (2003). Resource Guide for UV Protective Products 2003 – Information Section, Australian Radiation Protection and Nuclear Safety Agency, accessible at http://www.apparel.ca/_static/webupload/website Documents/100000/UV%20r.

Received: July 30, 2022

Accepted: August 22, 2022