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Enhancing water-use efficiency of Indian mustard (*Brassica juncea*) under deficit and adequate irrigation scheduling with hydrogel

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ABSTRACT

Among the oilseeds in India, *Brassica* ranks second in production after soybean. Sowing the crop under rainfed conditions on residual moisture in marginal and sub-marginal lands with limited nutrient use, ranks at the top for low productivity. Retaining moisture in the soil through supply of some water absorbing materials like hydrogel could prove to be a better prospect in this aspect. Keeping this in view, a field experiment was conducted during the *rabi* season of 2013-14 at N. E. Borlaug Crop Research Centre of G.B. Pant University of Agriculture and Technology, Pantnagar to study the effect of irrigation scheduling and hydrogel levels on the growth, yield attributes, yield, WUE and economics of Indian mustard. Plant height, dry matter accumulation, yield attributes, seed yield, WUE and benefit- cost ratio were influenced significantly with irrigation and hydrogel. Growth parameters, yield attributes and seed yield were higher at 0.6 IW/CPE ratio and hydrogel @ 5 kg/ha.

Optimization of sulphur and boron for mustard (*Brassica juncea* L. Czern. & Coss.) under eastern U.P. condition

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ABSTRACT

A field experiment was conducted during winter (*rabi*) season of 2012-13 and 2013-14 at Kumarganj, Faizabad, Uttar Pradesh to determine the optimum dose of sulphur and boron for mustard. The experiment was laid out in randomized Block Design (RBD) with three replications. Sixteen treatments consisted of four levels of sulphur (0, 20, 40, 60 kg ha⁻¹) and equal levels of boron (0, 0.5, 1.0, 1.5 kg ha⁻¹). Mustard variety NDR-8501 was undertaken in the investigation. The results showed that the application of sulphur and boron significantly increased the seed yield. The increasing level of sulphur and boron increased seed yield during both the years. The maximum seed yield was recorded with application of 60 kg S ha⁻¹ and 1.5 kg boron ha⁻¹ whereas the minimum was in the control treatment. However, from regression analysis, a positive and quadratic relationship was observed between seed yield and sulphur and boron levels. The optimum doses of sulphur and boron was calculated to be 50.20 and 49.65 kg S ha⁻¹, and 1.17 and 1.19 kg B ha⁻¹, for Faizabad area of eastern Uttar Pradesh, during 2012-13 and 2013-14, respectively.

Attitude of implementing officials towards Samagra

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ABSTRACT

Decentralized planning is strongly entrenched in the Kerala society since late 1990's. With experience spread over a decade and half in this regard, the Kerala state has to its credit many innovative projects in the agricultural sector which have left a lasting impact on the community. When it comes to sustainability and scaling up of such innovative projects, a large number of factors come into play. There has been some model projects such as the 'Samagra (comprehensive) Project' on Banana cultivation initiated by the Thiruvananthapuram District Panchayat with active participation of a host of institutional and individual stakeholders. The resounding success of the Project has paved the way for the further extension and expansion of the Project to benefit more 'Activity Groups' to be organised under the Kudumbashree Mission. The primary aim of this research study was developing a Likert's summated rating scale with which to measure farmers' attitude towards Samagra (Comprehensive banana project). The research was started by identifying 50 different statements based on review of literature and information obtained from various stakeholders and experts of the Samagra project. Out of these statements, 20 items were selected and ultimately only 6 consistent and reliable statements were retained for inclusion in a five point Likert's type scale. The 6 statements' scale was administered on 60 randomly selected sample farmers to measure their attitude towards Samagra. The result shows that 40 per cent of the beneficiaries had neutral attitude towards 'Samagra' and 60 per cent of the beneficiaries had favourable attitude towards Samagra'. None of them had unfavourable attitude towards Samagra'. This detailed study together with strict follow-up of data collection from the sample respondents has been extremely useful in developing a relatively consistent tool to measure farmers' attitude. Therefore, the 6 items five point Likert's scale can be applicable rest of the Indian states also.

Technological gap analysis of livestock production system in North-East U.P

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ABSTRACT

Livestock contribute 4.11 per cent to total GDP which is about one-fourth of the GDP from agriculture sector. Dairy farming has been recognized as the major pillar of rural development in Uttar Pradesh. A study was undertaken in five villages of Harhua block of Varanasi district. Majority of respondents (55.2 %) possessed medium level of knowledge for dairy practices and their adoption percentage was also same. Technological gap in dairying between the respondents varied from 50.73 to 75.84 per cent, however it was highest for health care component (75.84%) followed by breeding (60.48%) and management, (60.05%). Extensive technological gap in adoption of practices calls for paying attention by the government as well as social organizations.

Assessment of heterosis for yield and quality traits of fine grain rice genotypes of Uttarakhand hills

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ABSTRACT

Thirty six rice hybrids developed through line x tester crossing programme involving nine lines and four testers were evaluated for yield and its component traits. Significantly higher heterosis was observed in most of the hybrids for grain yield and components traits with few exceptions. In general, the estimated of heterosis values were low for quality traits as compared to yield and yield components. The magnitude of heterosis for all yield traits was not expressed in single hybrid combination and varied from cross to cross due to diverse genetic background of the parents. Crosses VL 30928 x Pusa Sugandh 3, VL 31486 x Pusa Sugandh 3, VL 30929 x Pusa Sugandh 3 manifested significant heterosis for grain yield as well as important quality characteristics in the desirable range whereas parent VL 30925, VL 30926, VL 30928, VL 30929, VL 31486 were the best parent for both quality characters and grain yield.

Evaluation of soil test methods for available N, P and K for french bean and maize in a mollisol

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ABSTRACT

Evaluation of the nutrient status in soil is important for nutritional, environmental, and economical aspects. The objective of this study was to evaluate suitable soil test methods so that availability indices for nitrogen (N), phosphorus (P) and potassium (K) could be assessed. Methods used were organic carbon (C) & alkaline KMnO_4 for available N, Olsen's-P, AB-DTPA & Mehlich-I for available P and NH_4OAc , AB-DTPA & Mehlich-I for available K. The relative suitability of these methods for a given nutrient was judged by comparison of the magnitude of R^2 values of the regression equations. Multiple regression equations of grain yield with different combinations of selected soil test methods i.e. organic C or alkaline KMnO_4 for available N, Olsen's-P, AB-DTPA or Mehlich-1 for available P and neutral normal NH_4OAc , AB-DTPA or Mehlich-1 for available K in soil, fertilizer levels and their interactions were carried out for both french bean and maize crops. The highest value of R^2 0.686** (Significant at $P = 0.01$) for French bean and 0.659** for maize were found with alkaline KMnO_4 , Olsen's and NH_4OAc methods and it showed that combination of these three methods was found more promising and superior over rest other methods.

Combining ability analysis for yield and yield contributing traits in tomato (*Solanum lycopersicum* L.)

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ABSTRACT

A study was conducted in tomato using a line \times tester mating design evolved thirty crosses with 10 genotypes as female parents (lines) and 3 genotypes as male parents (testers). The most promising general combiners were PT-2009-02 for fruit yield per hectare, fruit yield per plant, average fruit weight, S-816 for plant height PT-1 exhibited the highest General Combining Ability (GCA) for days to first harvest and days to last harvest. Most promising hybrids exhibiting significant Specific Combining Ability (SCA) effects were PT-19 \times Punjab Chhuhara for fruit yield per hectare, fruit yield per plant and average fruit weight, PT-41 \times Punjab Chhuhara for dwarfness, PT-41 \times Roma tallness and PT-11 \times PT-3 for earliness. The combining ability analysis indicated the importance of both additive and non-additive gene action for different growth, yield and fruit quality characters.

Supplementation effect of ammonium sulphate and sulphur coated urea on rumen metabolites in crossbred cow

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ABSTRACT

In order to study effect of supplementation of ammonium sulphate and sulphur coated urea on rumen metabolites, fifteen lactating crossbred cows were selected from Instructional dairy farm. Thirty gram ammonium sulphate and sulphur coated urea was given to group II and group III respectively in two equal doses at the time of milking while group I was taken as control. Rumen liquor was collected in mid of feeding trial at every two hour interval (0, 2, 4, 6 & 8 hours after feeding). The rumen liquor pH of supplemented groups decreased and varied significantly from the control. The lowest values were found at 2 hours after feeding. Total nitrogen in group III varied significantly from other two groups. Supplemented groups had lower ammonical nitrogen than group I and varied significantly ($P < 0.01$). Highest TCA-precipitable nitrogen was noted in group III which varied significantly. Total volatile fatty acids concentration also was high in supplemented groups and varied significantly ($P < 0.01$). Supplementation creates favourable environment for more microbial protein production.

Comparison of screening tests for detection of antibodies against brucellosis in different species of animals and human

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ABSTRACT

A total of 627 serum samples obtained from cattle (206), buffalo (79), sheep (09), goats (86), dogs (26) and humans (221) were subjected to a battery of brucellosis screening tests that included Rose Bengal plate agglutination test (RBPT), standard tube agglutination test (STAT), mercaptoethanol agglutination test (MET), heat-inactivation test (HIT), plate-enzyme linked immunosorbent assay (plate-ELISA) and dot-enzyme linked immunosorbent assay (dot-ELISA). The comparative field performance of these serological tests was examined. Results on overall performance of tests indicated that RBPT (15.08%) and plate-ELISA (10.36%) detected comparatively maximum number of reactors.

Role of lignolytic fungal enzymes in removal of industrially important carcinogenic dyes

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ABSTRACT

Synthetic dyes are widely used in many industries such as leather, paper printing, textiles, wool, cosmetics, and food. The major problems associated with the use of dye are that they are resistant to biodegradation, difficult to decolorize, non ecofriendly causing environmental and health hazards due to their carcinogenic nature. The use of extracellular enzyme systems from white rot fungi are now growing very fast for bioremediation and dye decolorization purposes. In view of above, present study was undertaken for decolorization of various synthetic and toxic dyes using wood rot fungal cultures. Thirty two fungal cultures were screened qualitatively for production of extracellular lignolytic enzymes. The selected fungal cultures removed the dye from the dye containing broth medium either by accumulating it in mycelia (biosorption) or by metabolizing it to some non-colored components. The cultures varied in their dye decolorizing potential, showing 47.31-97.36% and 14.18-93.63% decolorization of brilliant green and malachite green respectively in 24 d. All the selected cultures showed complete removal of congo red dye from the medium within one month. None of the fungal culture could remove/ metabolize crystal violet and fuchsin basic. The efficient strains were further evaluated for the production of various enzymes. In all the cases, maximum extracellular laccase, lignin peroxidase and Mn dependent peroxidase activities were observed within 15 to 18 d of incubation in culture supernatant. Photomicrographs clearly revealed presence of congo red dye within the fungal mycelia/spores. Among various cultures tested, the isolate WRF15 was found as the most potential isolate for synthetic dye decolourization and was identified as *Ganoderma* sp. using phenotypic characteristics of the fruiting body.

Effect of feeding of pointed gourd (*Trichosanthes dioica*) fruit and leaves on mortality and serum biochemical profile of common carp (*Cyprinus carpio*)

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ABSTRACT

In present study paste of *Trichosanthes dioica* fruit (TDF) and leaf (TDL) was fed to common carp at 3 different inclusion levels of 5%, 10% and 15% respectively of total feed. The experimental design incorporated total 6 groups, 3 each of TDF (G1, G2 and G3) and TDL (G4, G5 and G6) fed @5%, 10% & 15% of total feed given daily for 15 days. Groups fed with TDF paste showed high mortality rate whereas no mortality was seen in case of groups fed with TDL paste. No serum biochemical studies could be done in TDL fed groups because of high mortality. Fish fed with 15% TDF paste showed greater reduction in the levels of total blood glucose, aspartate amino transferase, alanine amino transferase, creatinine, whereas highest increase in total protein, albumin and globulin level was observed. The present study suggests that TDF can be used as a feed additive in fish feed upto 15% of inclusion level without any deleterious effect on fish health.

Comparative performance of rotavators with varying length in combine harvested rice field and assessing the matching power source

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ABSTRACT

Rotavators are becoming popular for tillage operation both in dry and wet land conditions mainly due to better quality work and less time requirement. However, selection of an appropriate size of rotavator for a given power source is difficult due to lack of data. In this study performance of four rotavators with different rotor lengths was evaluated in combine harvested rice field for seedbed preparation. Based on the result obtained, rotavator C and D performed better than other two rotavators, however, size of rotavator D with 195 cm rotor length was found appropriate for 37.3 kW tractor used in the experiment on the basis of specific work. The power consumption for these rotavators was found as 27.34 and 29.17 kW/meter rotor length respectively. The specific fuel consumption and specific tillage energy for these rotavators were found as 9.72, 9.82 l/m³ and 132.75, 96.24 MJ/m³ respectively. Both the rotavators saved 51.94 and 65.16 percent of energy over the smallest size (rotor length 1150 mm) of rotavator. On the basis of specific work and performable work of tractor, a matching tractor size of 29, 34, 44 and 50 hp was predicted for rotavators A, B, C and D respectively.

Enhancement of shelf life of fresh cut papaya under different storage conditions using edible coating

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ABSTRACT

Investigations were carried out to increase the shelf life of fresh cut papaya cubes. It is very important a fruit for the health purpose as papaya is the richest sources of antioxidant and nutrients such as Vitamin A (carotenes), vitamin C and flavonoids, vitamins-B, folate, pantothenic acid, minerals, potassium, magnesium and fiber. As the shelf life of peeled papaya is very less, to extend the shelf life of the papaya there is a need of new technologies. Edible coating appears one of the good alternatives for this. Edible coating is used as a barrier to minimize water loss. The independent factors which selected for coating of papaya cubes were, ratio of CMC and HPMC (1:0, 1:1, 0:1), and packaging materials (Aluminium foil and Cling wrap) were taken into account. The storage study of edible coated papaya cubes was carried out for 12 days. The pH, total soluble solids (°Brix), sensory and storage life were analyzed at an interval of 4 days. The result of the study shows that the pH of the stored papaya varied from 4.31 to 6.54 whereas TSS was found in range of 12.42 to 14.3 .Brix. The maximum effect on storage life on papaya cubes was when coated with CMC and packed with aluminium foil. The shelf life of papaya coated with CMC obtained 12 days while the shelf life of papaya packed with aluminium foil was found 11 days.

Optimization of drying parameters for fenugreek in solar tunnel dryer

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ABSTRACT

Fenugreek (*Trigonella foenumgraceum*), is highly perishable and one of the most important leafy vegetables widely used for culinary purpose. Drying increases the shelf life of product while mechanical drying involves higher cost of drying and open sun drying deteriorates the quality. Thus, the need for an intermediate level technology was realized and drying was carried out in developed solar tunnel dryer. The independent variables were taken as temperature (45-65°C), chimney height (0.7-1.1 m), product size (2-10 cm) and pre-treatment (0-10%). Response surface methodology was used to design the experiments. The fenugreek was dried from initial moisture content 746.03 to 1330.62% (db) to final moisture content 4.036-5.397% (db). Total drying time ranged from 230 to 420 min and considerably reduced by 67% in STD as compared to sun drying. To understand the physics of drying, the exponential model was found best than other models because higher R² and least SEE. Ascorbic acid and carotene were determined in the range of 22-38.08 mg/100g and 58.51-55.89 mg/100g. For good quality of dried product, the temperature, chimney height, product size and pre-treatment were found to be 51.75°C, 0.838 m, 4 cm and 4.325%.

Evaluation of retting methods on the properties of *dhaincha* fibres

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ABSTRACT

Fibres from *Sesbania aculeata* (*dhaincha*) plant were extracted by biological and chemical retting. In biological retting both the stagnant and running water methods were utilized whereas in chemical retting, two methods were used viz., the combination of EDTA and NaOH; pretreatment of HCl followed by NaOH. The physical properties such as tenacity and fineness of extracted fibres were observed and compared for different retting methods. The chemical retted fibres produced fibres of relatively lower tensile strength as compared to biological retted fibres. The 15 days stagnant water retting fibres exhibited highest tenacity of 5.43 g/ denier followed by running water and combination of EDTA and NaOH with tenacity of 5.11 g/ denier and 3.54 g/ denier respectively. Further it was observed that the combination of EDTA and NaOH showed good fineness value (27.2 denier) followed by fibres retted with HCl and NaOH with fineness value of 29.4 denier. The fibres obtained after 15 days of stagnant water retting were coarser as compared to other retting methods. Overall, the fibres obtained after 15 days of stagnant water retting exhibited tenacity whereas the combination of EDTA and NaOH revealed good fineness value.

A study of colour strength of cotton printed with black catch dye and sodium alginate gum

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ABSTRACT

Different printing paste recipes were prepared using a byproduct of Katha industry (Black catch) as dye in three different concentrations of 30%, 40% and 50%. The total amount of water required by the thickener to make a printing paste of optimum consistency was broken down into three dye: water ratios namely 25:75, 50:50 and 75:25. Washed cotton fabric was printed using flat screen method with two uniform strokes in forward and backward direction of the screen. Varying dye concentrations and dye: water ratios in printing paste significantly affected the colour strength values of printed cotton samples. There was increase in K/S on increasing the dye: water ratio from 25:75 to 50:50 and 75:25 in printing paste for all the three dye concentrations. Highest colour strength (4.963) was observed for 30% dye concentration with 75:25 dye: water ratio in printing paste. High dye concentration of 40% in all dye: water ratios performed lower on colour strength when compared to 30% dye concentration. Thus, the total amount of dye (in terms of dye: water ratio) added in printing paste played a major role in obtaining good colour strength with sodium alginate gum.

Effect of backpack use on musculoskeletal discomfort among preadolescents school children

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ABSTRACT

The main aim of this study was to investigate the work-related musculoskeletal disorders (WMSDs) by using Nordic musculoskeletal discomfort and VAS scale in different body parts of 7th class students while carrying the heavy back packs. It was a descriptive study conducted in CBSE affiliated schools of Meerut and total selected samples were 100 students, 50 boys (50%) and 50 girls (50%). They all were selected by using the random sampling method. To investigate WMSDs, it included detailed questions on work-related pain in different body parts. Work-related pain/discomfort was reported in 12 month, one month and prevalence in 7 days. All the selected students had given their responses, which were analyzed by statistical analysis i.e. frequency, percentage, mean score, SD, range and ranking order. The results showed that majority of respondents expressed severe pain in both shoulders (32 percent), lower back (30 percent), neck (26 percent), upper back (18 percent), right shoulder and legs (16 percent), knees (14 percent), elbows (6 percent) left shoulder (2 percent), wrist and hands just because of heavy backpacks. Data revealed that during the last 12 months cent percent of the boys reported pain and discomfort in upper back. Revealed that 83.33 percent girls and 90 percent boys reported pain in upper back whereas 73.33 percent in ankles and feet during last 7 days.

Comparative evaluation of functional properties of finger millet flour and foxtail millet flour with refined wheat flour

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ABSTRACT

The present study was conducted to evaluate the functional properties of finger millet flour and foxtail millet flour and their comparison with refined wheat flour. Flours from finger millet and foxtail millet were taken and evaluated for functional properties viz. water absorption, fat absorption, emulsion activity and emulsion stability, sedimentation value, dough raising capacity and particle size distribution. Gluten content of all the millet flour was also analysed. The results showed that foxtail millet flour exhibited higher functional characteristics than finger millet flour and refined wheat flour.

Nutritional and phytochemical composition of improved varieties of buckwheat grains (*Fagopyrum esculentum* Moench) in India

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ABSTRACT

The study was undertaken to analyze the nutrient and phytochemical composition of seven cultivars of buckwheat grains. Six indigenous cultivars of buckwheat viz. PRB 9001-I, IC-3141, IC-8819, IC-8869, Himpriya, VL Ugal and a local variety of buckwheat grains were processed to obtain whole flour and 40 mesh sieved flour. Proximate constituents in different cultivars of sieved buckwheat flour (SBF) were found to be in the range of 0.75 to 2.33, 10.43 to 11.23, 1.82 to 3.10, 3.53 to 4.80 and 66.01 to 72.89 per cent for crude fat, crude protein, total ash, crude fibre and carbohydrate respectively. SBF was also observed to be an excellent source of fibre with total dietary fibre observed in the range of 14.52 to 17.77 per cent and soluble dietary fibre 5.11 to 6.84 per cent. VL Ugal cultivar was found to be significantly better than other varieties in terms of its protein, calorific value and iron content. Buckwheat grains were also found to be a good source of calcium, which ranges from 56.60 to 94.34 mg/100gm in SBF. Phytochemical analysis revealed that different cultivars of buckwheat contain negligible amounts of tannins, oxalates and glucosinolates. Phytate content was found to be high in different cultivars of SBF i.e. ranging between 184 to 339.7 mg/100gm

Coping strategies of parents for perceived stress resulting from having intellectually disabled child: comparison across educational level of parents

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ABSTRACT

The purpose of the present investigation was to study the differences in type and level of coping mechanism of parents with intellectually disabled children across their education level. Parents of 150 intellectually disabled children from 3 RCI (Rehabilitation Council of India) recognized special schools of Delhi were selected as a sample for the study. Sample was randomly drawn in equal proportions from three levels of intellectual disability i.e. mild, moderate and severe from both low and middle income groups. The coping strategies of parents were assessed using Family Interview for Stress and Coping in Mental Retardation, Part II developed by NIMHANS. The study revealed that the educational status of parents was seen to influence their coping mechanisms. Mothers with higher education level had better general awareness regarding child's condition, low misconceptions; had expectations from their special need child; showed favourable attitudes towards child & child management and reported favourable rearing practice specific to training. Similarly, fathers with higher educational status also reported better coping strategies in these said domains.

Stress, anxiety and depression: Comparison among institutionalised and non institutionalized elderly across gender

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ABSTRACT

The present research study was carried out to explore and compare the level of stress, anxiety and depression among institutionalized and non-institutionalized elderly across gender. The sample comprised of 100 institutionalized and 100 non institutionalized elderly making a total of 200 elderly. A self-designed questionnaire was used to study the socio-demographic characteristics of respondents whereas, Anxiety, Depression and Stress Scale by Bhatnagar *et al.* (2011) was administered to identify the levels of anxiety, depression and stress of respondents. The findings of the study highlighted the significant variations in stress, anxiety and depression among institutionalised and non-institutionalised elderly across gender. Male elderly were significantly found to be more stressed but less anxious and depressed than their female counterparts. Frequency distribution underlined the common belief that institutionalized elderly experience more stress, anxiety and depression than non-institutionalized elderly. Thus, the findings of the present study highlight the effect of gender and institutionalization on the emotional health of elderly.

A study on assessment of nutritional knowledge and impact of nutrition education on knowledge level of adolescents

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ABSTRACT

The present study was designed to assess the nutritional knowledge among the adolescents and impact of nutrition education on their knowledge level. A sample size of 1101 adolescents in the age group of 12-18 years of class 7th to 12th were selected from two schools of district Udham Singh Nagar, Uttarakhand. A nutrition and health awareness program was conducted for a period of six months. The nutritional knowledge of adolescents was assessed with the help of a developed questionnaire. A pre test was conducted for adjudging the existing level of nutrition knowledge about health, nutrition, healthy cooking methods and personal hygiene. After imparting nutrition education post test questionnaire were distributed to adjudge the gain in nutrition knowledge of adolescents. The data collected was statistically analyzed by analysis of variance (one way ANOVA). The results revealed that the per cent increment in knowledge level of adolescents was 41.57 per cent. Thus nutrition education is an effective measure to bring about the favorable and significant change in knowledge level.

Dietary assessment and role of nutrition education in creating nutrition awareness among adolescent girls

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ABSTRACT

The present study was carried out for six months to assess the dietary pattern, existing knowledge about the nutrition and its importance among the adolescent girls and impact of nutrition education on the knowledge increment of 10 to 17 years of age was selected from three different government schools of district Udham Singh Nagar, Uttarakhand. The dietary pattern of the girls was assessed through 24 hour recall method. Mean intake of calorie, protein, fat, iron, thiamine, riboflavin and niacin were lower than the Recommended Dietary Allowances. The dietary pattern indicated poor consumption of milk, fruit, meat and green leafy vegetables. Due to low consumption of important nutrients the adolescents girls are at higher risk of nutrient deficiency diseases. The nutritional knowledge of adolescents was assessed with the help of a questionnaire. For assessing the existing knowledge of nutrition a pre test was conducted in which questions related with nutrition were there. After conducting pre test, nutrition education was imparted to the adolescent girls through lecture cum discussion method, thereafter post test was conducted and the data collected was analyzed and the results revealed that the per cent increment in knowledge level of adolescents was 46.19 per cent. A sample size of 2446 adolescent girls Thus, nutrition education intervention seems to have a positive effect on nutritional awareness level which would eventually encourage expansion of knowledge and positive nutrition and health habits.

Genetic evaluation of bitter gourd for yield parameter under tarai region of Uttarakhand

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Note: This is a short communication and as such, does not have an ABSTRACT. For details, see the print journal or contact the authors at above address.