

IN VITRO ORGANOGENESIS AND PLANT REGENERATION IN *BRASSICA* SPECIES

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ABSTRACT

High frequency regeneration of plants from *in vitro* cultured tissues is prerequisite to use genetic transformation to enrich oleiferous *Brassica spp.* Emphasis was given in this study on callus induction aptitude and subsequent plant regeneration from cotyledon and stem segment of three of *Brassica spp.* viz BARI sarisa-8 (*Brassica napus*), Daulat (*Brassica juncea*) and Sonali (*Brassica campestris*). Two milligram per litre of Kn, BAP (1.0, 2.0, 3.0 mg/l) and constant concentration of NAA (0.5 mg/l) were used in MS medium. The result showed that stem segment produced maximum percentage of callus and subsequent shoot regeneration in all the four treatments BARI sarisa -8 Showed best performance in callus induction and it take minimum (6-7 days) for callus initiation. Shoot initiation potentiality also highest in the same variety under studied. The variety sonali showed poor performance for all the parameter under studied. Rooting occurred simultaneously from regenerated shoot on half strength MS medium supplemented with 0.5 mg/l IBA. Regenerated plantlets were successfully transferred to pots containing a mixer of soil and vermiculite.

Keywords: callus, regeneration, *Brassica spp.*, growth hormone

INVESTIGATION ON PERFORMANCE AND CARCASS CHARACTERISTICS OF CROSS-BRED (RIR X FAYOUMI, F₁) COCKERELS AT DIFFERENT AGES

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ABSTRACT

The research was conducted to investigate the profitable market age of Cross-bred (RIR X Fayoumi) cockerel reared for meat purpose on semi-scavenging system. One hundred and twenty birds were used in the experiment which was distributed randomly into 4 groups such as A1, A2, A3 and A4 depending on rearing age. Each group contains 10 birds. Data on group A1, A2, A3 and A4 were recorded at the age of 12, 14, 16 and 18 weeks respectively with similar type of ration. The data of the present study showed that average live weight of the birds at 12, 14, 16 and 18 weeks were 738.33g, 919.00g, 1099.33g and 1276.67g respectively and all the treatment groups were significantly different ($P < 0.05$) among them. Feed intake was varying from 3457.33g to 6535.00g and all the treatment groups were significantly different ($P < 0.05$) at 5% level. The FCR value was significantly lower ($P < 0.05$) in A1 (4.68) and followed by A2 (4.91), A3 (4.95) and A4 (5.12). Lower FCR value indicates positive performance. The lower mortality mean value 6.67% was found in A2 and no significant differences was found among the treatments. The mortality mean value was 8.33%, but no significant difference ($P > 0.05$) was found in mortality. The cost benefit ratio (CBR) of A2 (1.14) and A3 (1.14) groups were significantly higher ($P < 0.05$) than A1(1.09) and A4 (1.11) groups, no difference ($P > 0.05$) was found between A2 & A3 and A1 & A4 groups. The dressing % and carcass parts of A1, A2, A3 and A4 were statistically non significant ($P > 0.05$). According to Cost Benefit Analysis, 14 weeks were the best profitable marketing age for sonali cross-bred male chicken, although dressing percent and carcass weight percent of breast, thigh, drumsticks, back, wings and neck was not affected ($P > 0.05$) by different age groups.

Key words: carcass, cross-bred, cockerels, ages.

EFFECT OF INTEGRATED MANAGEMENT APPROACH FOR COMBATING ANGOUMOIS GRAIN MOTH (*Sitotroga cerealella*) POPULATION AT DIFFERENT GENERATION

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ABSTRACT

Effect of integrated management approach was studied for combating angoumois grain moth, *Sitotroga cerealella* (Olivier) at different generation in terms of adult emergence, adult longevity and population ratio during the period from March 2011 to September, 2011 in the Department of Entomology, Sher-e-Bangla Agricultural University, Dhaka, Bangladesh. The treatments of the studies were: Cleanliness of the storage including the container and premises (sanitation) + Use of dried neem kernel powder @ 10 gm/kg (T₁); Cleanliness of the storage including the container and premises (sanitation) + Use of dried tobacco leaves powder @ 5.0 gm/kg (T₂); Sanitation + use of insecticide in the empty bins as preventative measure + Use of dried neem kernel powder @ 10 gm/kg (T₃); Sanitation + use of insecticide in the empty bins as preventative measure + Use of dried tobacco leaves powder @ 5.0 gm/kg (T₄); Sanitation + Release of *Trichogramma evanescense* after 30 days interval (number of *Trichogramma* = 100/plastic container or replication (T₅); Sanitation + Application of fumigant practice with phosphine gas with doses depending on the temperature and humidity and the pest population (T₆) and Untreated control (T₇). The study was laid out in a Completely Randomized Design (CRD) with four replications. In 1st generation no adults emerged in T₆ treatment which was followed by T₅ (9.67) whereas the highest (38.00) adult was recorded in T₇ (untreated control) treatment. Similar trend of adult emergence was observed in 2nd generation and 3rd generation of the pest. In 1st generation no adult longevity was recorded in T₆ treatment whereas the highest (10.00 days) adult longevity was recorded in T₇ treatment. Statistically significant variation was recorded for number of female, male and their ratio for 1st, 2nd and 3rd generation of angoumois grain moth in stored rice grain due to integrated management approaches.

Keywords: angoumois grain moth (*Sitotroga cerealella*), integrated management approach, adult emergence, adult longevity, population ratio

INTEGRATED MANAGEMENT FOR HIGHER CURD YIELD AND QUALITY OF BROCCOLI (*Brassica oleracea* var. *italica* L.)

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ABSTRACT

An integrated management was taken to investigate the effect of macronutrients, micronutrients, cowdung, mustard oilcake and mulches on different yield contributing characters, yield and quality parameters of broccoli during October 2011-March 2012 at the Horticulture Farm, Sher-e-Bangla Agricultural University, Dhaka. The experiment included six treatments using T₁= 15 t/ha Cowdung + N₁₁₅P₇₂K₁₂₀ (recommended dose of cauliflower), T₂= 15 t/ha Cowdung + N₁₂₀P₁₀₀K₁₄₀S₂₀ kg/ha, T₃= 15 t/ha Cowdung + N₁₂₀P₁₀₀K₁₄₀S₂₀ + Zn₄B_{1.5}Mo₁ kg/ha, T₄= 20 t/ha Cowdung + 400 kg/ha mustard oilcake, T₅= N₁₂₀P₁₀₀K₁₄₀S₂₀ + Zn₄B_{1.5}Mo₁ kg/ha + 20 t/ha Cowdung + 400 kg/ha mustard oilcake and water hyacinth mulch, T₆= N₁₂₀P₁₀₀K₁₄₀S₂₀ + Zn₄B_{1.5}Mo₁ kg/ha + 20 t/ha Cowdung + 400 kg/ha mustard oilcake. Significant variation was recorded in case of plant height, number of leaves, leaf length, leaf breadth, days to curd initiation, stem length, stem diameter, primary curd diameter, curd weight, number and weight of secondary curd, curd yield, moisture (%), ascorbic acid, β carotene content, protein and carbohydrate percentages except total fat percentages, iron and calcium content. The maximum curd yield (24.15 t/ha) was found from T₆ treatment and the minimum was recorded from T₄ (15.26 t/ha) treatment. T₆ treatment showed the best performance on the maximum yield and quality curd production over all the other treatments.

Keywords: broccoli, integrated management, yield and quality.

COLLECTION TECHNOLOGY OF WOOL FOR MARKETING

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ABSTRACT

This research was conducted to find out the performance of sheep-wool in Bangladesh. A complex multi-equation system model is established to represent the collection of wool from sheep using both Annual Selling and Simulation Matrix (SIMM) Model Technologies. The objective of this research was to determine wool production, effective wool collection and marketing from sheep farming. The number of sheep like 1, 10, 100, 1000 etc. is reared up by the small, medium large and commercial farmers. Results show sheep producer can sale all kids at the end of the year except selling female sheep and can collect 1, 10, 100, 1000kg wool from rearing 1, 10, 100, 1000 female sheep respectively. The shearing of wool twice and selling kids in a year can be a technology of wool collection. So if sheep-producers' target is only wool collection then needs establishing wool local market first. Therefore, at present raw and finished wool market needs to be established before starting wool production i.e. sheep farming.

Keywords: wool collection, sheep production, annual selling method, SIMM method

EFFECT OF POSTHARVEST TREATMENTS ON SHELF LIFE EXTENSION OF GUAVA

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ABSTRACT

The experiment was conducted to develop an appropriate storage method and shelf life of two guava varieties, namely Swarupkathi and Kazi Piara under different postharvest treatments. Six postharvest treatments viz., control, hot water, neem extract, brown wrapping paper, perforated white polythene bag and non-perforated white polythene bag were assigned to the guava fruits. The two factors experiment was laid out in a completely randomized design with three replications. Among the physico-chemical parameters such as reducing and non-reducing sugar contents increased significantly, whereas titratable acidity and vitamin C contents decreased during storage in all treated and untreated fruits. Between two varieties, the shelf life of Kazi Piara (9.89 days) was higher than that of Swarupkathi (7.94 days). The postharvest treatments showed highly significant variation in the shelf life of guava. The shelf life extended up to 13.00 days by using non-perforated white polythene bag. The fruits stored in non-perforated white polythene bag having longer shelf life resulted slow change in its chemical components. The shelf life of variety Kazi Piara could be extended up to 13.00 days by using non-perforated white polythene bag.

Keywords: guava, treatments, shelf life.

PROFITABILITY ANALYSIS OF HYV BORO RICE UNDER DIFFERENT TENURE SYSTEMS IN JHENAIDAH DISTRICT OF BANGLADESH

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ABSTRACT

An attempt has been made in this study to examine the profitability of Boro rice producing farms according to these three tenure groups such as owner, cash tenant and crop share tenant farmers. About 90 sample farmers, 30 owner farmers, 30 cash tenant farmers and 30 crop share tenant farmers were selected for the present study. The field survey was conducted over the period from July-September, 2014. The average gross returns per hectare were Tk. 108933.00, Tk. 119079.50 and Tk. 117368.48 in owner, cash tenant and crop share tenant farmers respectively. Gross return was higher of cash tenant farmer than other farmer but the total cost of production was higher in owner farmer and cash tenant farmer so their net return is lower than crop share tenant farmer. It was observed that per hectare net return was Tk. 14296.78, 27285.54 and 38615.72 for the owner, cash tenant and crop share tenant farmers respectively. Which indicates that crop share tenant farmer earned more profit than the other farmers.

Keywords : boro rice production, profitability, tenure systems

CORRELATION AND PATH CO-EFFICIENT ANALYSIS OF YIELD CONTRIBUTING TRAITS IN ADVANCED LINES OF *Brassica rapa* L.

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ABSTRACT

Twenty four genotypes including four check varieties of the species *Brassica rapa* L. were collected to estimating the magnitude of correlation and path co-efficient of different characters on seed yield per plant. The significant positive correlations with seed yield per plant were found in thousand seed weight, no. of siliqua per plant, no. of primary branches per plant. Path co-efficient analysis revealed that plant height, no. of primary branches per plant, no. of siliqua per plant, siliqua length, thousand seed weight showed positive direct effect with yield per plant. Days to 50% flowering, days to 80% maturity, no. of secondary branches per plant, no. of seed per siliqua showed negative direct effect on yield per plant. Beside these days to 50% flowering, days to 80% maturity, no. of secondary branches per plant, no. of seed per siliqua showed negative direct effect on yield per plant.

Key words: correlation, path co-efficient, *brassica rapa* L

EFFECT OF SUPPLEMENTING *Moringa oleifera* LEAVES AS FEED ADDITIVES ON BLACK BENGAL GOAT

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ABSTRACT

Moringa (Moringa oleifera Lam. moringaceae) is a highly valued plant that is mostly cultivated in the tropics and subtropics. It is used for food, medication and industrial purposes. The objective of the study was to assess the nutritional value of *Moringa* leaves and to determine the effect of supplementing *Moringa oleifera* leaves (MOL) on growth performance, carcass and non-carcass characteristics of Black bengal goats. The dried leaves had crude protein levels of 30.3%. The dried leaves had the following mineral contents: calcium (3.65%), phosphorus (0.3%), magnesium (0.5%), potassium (1.5%), sodium (0.164%), sulphur (0.63%), zinc (13.03 mg/kg), copper (8.25%), manganese (86.8 mg/kg), iron (490 mg/kg) and selenium (363 mg/kg). The fiber content was neutral detergent fibre (NDF) (11.4%), acid detergent fibre (ADF) (8.49%), acid detergent lignin (ADL) (1.8%) and acid detergent cellulose (ADC) (4.01%). The condensed tannins had a value of 3.2%, while total polyphenols were 2.02%. In the other hand, a total of 36 castrated goats aged 8 months, with a mean initial weight of 7.63±0.8 kg, were randomly divided into three diet groups with twelve goats in each. The duration of the trial was 90 days. All goats received a basal diet of grass *ad libitum* and mixed basal diet (200 g/day each). The MOL groups were fed additional 100g (MOL1) and 200 g (MOL2) of dried *M. oleifera* leaves, respectively. The third group (Control) did not receive any additional ration. The attained average daily weight gain for goats fed MOL1, MOL2 and Con were 103.3, 101.3 and 43.3 g, respectively (P<0.05). Higher (P<0.05) feed intakes observed were in MOL2 (491.5 g) and MOL1 (490.75 g) compared with Con (404.5 g). The hot carcass weight was higher (P<0.05) for MOL2 (7.18 kg) and MOL1 (7.14 kg) than for the Con group (5.46 kg). The dressing percentage in MOL2 (50.8%) and MOL1 (50.0%) were higher (P<0.05) than that of the Con (44.9%). The growth performance and carcass characteristics of MOL2 and MOL1 goats were not different. Moreover the experimental result reveal that MOL has a cholesterol lowering effect and no lesion has been identified in the gastrointestinal mucosa of the parasitized animals fed on MOL mixed diet. Feeding MOL improved the growth performance and carcass characteristics of goats in an almost similar way, which indicates that *M. oleifera* could be used as a supplement or additives in goats.

Keywords: black bengal goat, carcass characteristics, growth performance, *moringa oleifera*, supplements

ARSENIC ACCUMULATION OF ANIMAL FEED (GRASS AND WATER HYACINTH) IN FARIDPUR SADAR UPAZILLA

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ABSTRACT

Elevated level of groundwater arsenic (As) in Bangladesh has resulted as a massive calamity of exposing a large population to health risk and affecting livelihood and sustainable development of the country. The extensive use of arsenic contaminated groundwater in irrigation poses a potentially long term detrimental effect to human health as well as it is an environmental hazard. Arsenic is spreading in various ways in the environment and creating various hazards. This study was performed to detect the level of arsenic concentration in animal feed chain. Grass and Water hyacinth samples of two commonly used animal feeds were collected from arsenic contaminated areas of Faridpur district. After collection, the samples were prepared by a series of steps such as, washing, drying and digestion; finally arsenic was determined by atomic absorption spectrophotometric method. For this purpose the FI-HG-AAS (Flow Injection Hydride Generator Atomic Absorption Spectrophotometer) method was used. The arsenic absorbed by the animal feed (grass and water hyacinth) samples was determined. The mean arsenic concentration in Grass and Water hyacinth were 0.397 ± 0.075 ppm ($n=20$) and 0.365 ± 0.035 ppm ($n=20$), respectively. In this study it was found that the level of arsenic both in Grass and Water hyacinth is greater than that of the maximum permissible level in drinking water (0.05 ppm, WHO). This study was performed to detect the level of arsenic in animal feed of As contaminated area of Faridpur district.

Key words: arsenic, animal, grass, water hyacinth

GENOTYPE-ENVIRONMENT INTERACTION AND STABILITY ANALYSIS OF CHILLI (*Capsicum frutescens* L.)

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ABSTRACT

An investigation was performed for assessment of genotype-environment interaction and stability of the 10 promising genotypes of Chilli on plant height, root length, individual fruit weight, fresh weight of shoot, oven dry weight of shoot and fruit yield per plant with ten promising chilli (*Capsicum frutescens* L.) genotypes. The experiment was laid out in randomized complete block design with three replications and four environments. The combined analysis of variance showed that the mean sum of square due to Genotype (G), Environment (E) and $G \times E$ interaction were significant for all the characters studied here suggesting presence of significant variation among the genotypes and environments. The additive main effects and multiplicative interaction (AMMI) biplot for yield clearly indicated that Env-3 (Urea + TSP + MOP + Boric Acid) and Env-4 (only Cow dung) were poor and Env-1 (Urea + TSP + MOP + Gypsum+ ZnO) and Env-2 (Urea + TSP + MOP + Cow dung) were found to be rich and favourable due to high inputs for chilli production. Where, Env-2 (Urea + TSP + MOP + Cow dung) was found highly favourable for chilli production. The stable genotypes found were BD-2059 and Bogura Jatt, exhibited moderate mean yield and could be adopted for general cultivation. Kalo Dhawna morich, Bogurar Lomba Morich and Bullet exhibited comparatively higher mean yield but were unstable across the environments and can be recommended to cultivate in rich environments.

Key words: genotype, environment, interaction, stability, *Capsicum frutescens*, AMMI

YIELD OF BROCCOLI AS INFLUENCED BY COWDUNG AND MUSTARD OILCAKE

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ABSTRACT

The experiment was conducted during October, 2009 to March 2010 at the Horticulture Research Farm of Sher-e-Bangla Agricultural University, Sher-e Bangla Nagar, Dhaka to determine the response of organic manure on yield, quality and economic benefit of broccoli. The experiment included 16 treatments with 4 levels of cowdung manure (0, 10, 20 and 30 t/ha) and 4 levels of mustard oil cake (0, 300, 400 and 500 kg/ha) were used to study the effect of these on broccoli production. All treatments showed significant influence on days to curd initiation, primary curd diameter, stem diameter, primary curd weight, number of secondary curds per plant, weight of secondary curds, dry matter content of curd, curd yield but it did not show any significant effect on chlorophyll a and b content in leaves, moisture(%), protein (%) ascorbic acid content of curd. The maximum curd yield per hectare (15.27 t/ha) were found from the C₂M₂ (20 t/ha cowdung + 400 kg/ha mustard oil cake) treatment and the minimum curd yield (8.07 t/ha) was obtained from the control.

Keywords: broccoli, organic manure, yield