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# MORPHO-PHYSIOLOGICAL AND BIOCHEMICAL CHARACTERIZATION OF WHEAT UNDER THE WATER DEFICIT CONDITIONS

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**Abstract:** In present study the 10 wheat genotypes were evaluated for their morphological, physiological and biochemical characters under drought stress. Drought is one of the most important phenomena which limit crop production and yield. Analysis of variance for morpho-physiological and biochemical traits and yield revealed highly significant differences among the entries under irrigated and non irrigated condition. In this study parameter like plant height, leaf length, number of tiller, spike length, spikelets per spike, seeds per spike, chlorophyll content, RWC, MSI and proline content was recorded. Analysis of the data showed that under water stress condition HD 2733 showed highest no. of tiller (4.37), Spikeletes per spike (17.20) and seeds per spike (21.20). While highest chlorophyll content genotype DBW 71 (34.37). RWC and MSI under the stress condition genotype HD 2733 performance better. Proline accumulation is believed to play adaptive roles in plant stress tolerance. Accumulation of proline has been advocated as a parameter of selection for stress tolerance. Therefore, the objective of the present investigation was to find out suitable morpho-physiological and biochemical traits that could be invariably used for the yield improvement of wheat grown under drought stress condition, responses to drought is essential for a holistic perception of plant resistance mechanisms to water-limited conditions. Crops demonstrate biochemical responses to tackle drought stress. All these parameters were found to greatly affect under imposed drought condition. Almost all the parameters were showed decline under imposed drought condition except proline content which is known as a stress tolerant indicator.

**Keywords:** Wheat, Morpho-physiological character, Proline, Drought Stress



# EFFECT OF POST EMERGENCE HERBICIDE ON WEEDS AND ECONOMICS OF FINGER MILLET

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**Abstract:** Weeds are the major biotic stresses for finger millet cultivation. Initial slow growth of the finger millet favours weed growth. *Echinochloa colona* among grasses, *Cyperus iria* among sedges and *Alternanthera triandra, Eclipta alba* and *Phyllanthus urinaria* among broad leaf weeds were dominant. Weed index (loss of yield due to weeds) was found to be minimum with application of ethoxysulfuron (34.37 %). The maximum weed index was found with application of fenoxaprop-p- ethyl (93.62 %) at higher level (45.0 g $ha^{-1}$). In the experimental field, the most dominant species was *Echinochloa colona* which ranged between 24-46 per cent at all the growth stages. It was followed by *Phyllanthus urinaria* (13-18 %), *Eclipta alba (5-26 %), Cyperus iria* (3-23%) and *Alternanthera triandra* (5-12 %).There was complete control of broad leaf weeds *viz. Alternanthera triandra, Eclipta alba* and *Phyllanthus urinaria* and sedges *i.e. Cyperus iria* by the application of metsulfuron methyl + chlorimuron ethyl and ethoxysulfuron, where as grassy weed *i.e. Echinochloa colona* was completely killed by the application of fenoxaprop-p-ethyl and showed 100% weed control efficiency, respectively. Hand weeding twice recorded the highest grain yield and net return. Application of ethoxysulfuron registered the highest B:C ratio which was at par with metsulfuron methyl + chlorimuron ethyl and hand weeding twice.

**Keywords:** Weed management, Finger millet, Herbicide, Weed

# CROP PRODUCTION PROFILE OF GARLIC IN THE RAIN SHADOW REGION OF IDUKKI DISTRICT, KERALA

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**Abstract:** Commercial garlic cultivation in Kerala is confined to Kanthalloor and Vattavada panchayaths of Devikulam block, Idukki. A unique system of production, curing and storage of garlic exists in this high range, having an annual temperature of 23.7$^0$C and rainfall 1276mm. The study revealed that the extent and experience in garlic cultivation was more in Vattavada though two cropping seasons were practiced in Kanthalloor. "Mettupalayam", "Singapore" and land race "Malapoondu" are the major ecotypes grown in this area. Storability is more in "Singapore" and "Malapoondu" but farmers prefer "Metupalayam" because of its short duration. Yield contributing parameters like equatorial diameter(4.3cm), polar diameter(4.2cm) and bulb weight(21.8g) were significantly high in Singapore. The skin thickness(1.58mm) and average number of cloves per bulb(18.3) were more in "Malapoondu". The major constraints in garlic production as perceived by farmers were small size of garlic cloves, high incidence of pest and disease and attack by wild animals.

**Keywords:** Bulb characters, Constraints in production, Ecotypes, Garlic, Kerala



# SURVEY FOR THE INCIDENCE OF RICE BLAST DISEASE IN DIFFERENT AGRO CLIMATIC ZONE OF CHHATTISGARH

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**Abstract:** Rice blast disease caused by *Pyriculariaoryzae*Cavara has become the one of major fungal disease covering in major rice growing area and the first time a survey was conductedduring *Kharif* -2016-17in different rice growing districts of Chhattisgarh State, to determine thedisease incidence, occurrence, disease severity and spread of rice blast disease in three agro climatic zone *viz*., Bastar Plateau Zone (Zone-I), Chhattisgarh Plains Zone (Zone-II) and Northern Hills Zone (Zone-III). Theassessment of rice blast was carried out in thirteen major rice growing districts viz., Jagdalpur (Bastar), Dantewada, Narayanpur, Bilaspur, Janjgir-Champa, Kanker, Bemetara, Raipur, Dhamtari, Gariyaband, Balrampur, Surajpurand Surguja from August last week to October 2016 and September first week to October 2017. Among the thirteen districts, percent disease index was varied from 20 to 87.78%. The highest percent disease index (PDI) was recorded (87.78%) in Jagdalpur(Bastar)district with Swarna cultivar which is followed by Surguja (85.56%) and Balrampur (84.44%)and lowest PDI was recorded (20%) in Surajpur (Maheshwari) and Bastar (Safari). The more severity of rice blast disease might be due to the highly favorable factors like application of excessive doses of nitrogenous fertilizers, intermittent drizzles, cloudy weather, highy relative humidity (>90%), low night temperature (<26 C), more number of rainy days, longer duration of dew, slow wind movement and availability of collateral hosts. Thus, their serve as basic to evaluate location specific integrated disease management strategy against rice blast disease.

**Keywords:** Rice blast, Severity, Incidence, Disease



# EFFECT OF ENVIRONMENTAL CONDITIONS ON THE DEVELOPMENT OF ALTERNARIA BLIGHT OF TOMATO (*LYCOPERSICON ESCULANTUM* MILL.)

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**Abstract:** The environmental factor play very important role in the development of the plant disease. Alternaria blight of tomato during two year is observed 2014-15 and 2015-16 crop season. The disease appears in the 3rd week of November in both the year. Maximum disease incidence 40.5% was observed in the 4th week of January 2014-15 and 2nd week of January 2015-16 crop season. When the average temperature and relative humidity 14.1 and 84.2% on the average disease incidence was observed 3rd week of January 2014-15 and 2nd week of January 2015-16 crop.

**Keywords:** Environmental factor, Alternative, Tomato

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## EFFECT OF PHOSPHORUS, ZINC AND IRON ON GROWTH ATTRIBUTES AND YIELD ATTRIBUTES OF WHEAT IN LOAMY SAND SOILS OF WESTERN RAJASTHAN

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**Abstract:** A field experiment was carried out during two consecutive *rabi* seasons of 2009-10 and 2010-11 at the Agronomy farm, College of Agriculture, Swami Keshwanand Rajasthan Agricultural University, Bikaner to find out the effect of phosphorus, zinc and iron on growth attributes and yield attributes of wheat (*Triticum aestivum* L.) in Loamy sand soils of Western Rajasthan with ten treatments comprising 4 levels of phosphorus (0, 20, 40 and 60 kg $ha^{-1}$) and zinc (0, 3 and 6 kg $ha^{-1}$) in main plots and 3 levels of iron (0, 3 and 6 kg $ha^{-1}$) in split-plot design with three replications. Application of phosphorus up to 40 kg $P_2O_5$ $ha^{-1}$ significantly increased the dry matter production, CGR and RGR of wheat over control at 30, 60, 90 DAS and at harvest in pooled analysis. Yield attributes viz. effective tillers $plant^{-1}$ and number of grains $ear^{-1}$ were also significantly enhanced with the increasing level of phosphorus up to 40 kg $P_20_5$ $ha^{-1}$ in pooled analysis. Application of phosphorus up to 40 kg $P_2O_5$ $ha^{-1}$ significant]y increased the grain, straw and biological yields beyond which it increased non-significantly and registered a mean increase of 26.2, 30.6 and 28.8 per cent, respectively over control.

**Keywords:** Phosphorus, Zinc, Iron, Growth attributes, Yield attributes, Wheat

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## SYSTEM PRODUCTIVITY AND PROFITABILITY OF BABY CORN (*ZEA MAYS* L.) – HORSE GRAM (*MACROTYLOMA UNIFLORUM*L.) CROPPING SEQUENCE AS INFLUENCED BY SOWING SCHEDULE AND INTEGRATED NUTRIENT MANAGEMENT

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**Abstract:** A field experiment was conducted in two consecutive rainy (*kharif*) seasons of 2012 and 2013 at Ambikapur to work out the effect of sowing schedule and integrated nutrient management systems on the productivity and profitability of baby corn (*Zea mays* L.) and horse gram (*Macrotylomauniflorum* L.) cropping system. The horse gram was sown as utera crop just before harvesting of baby corn. Baby cob, baby corn, green fodder, horse gram yield and economics were higher in sowing of first schedule (1st week of July) showed parity with second (2nd week of July) and third (3rd week of July)

sowing schedule but significantly superior to fourth sowing schedule *i.e.* 4th week of July. Further, application of 125% RDF + 5 t FYM significantly increased the baby cob, baby corn, green fodder, horse gram yield over 100% RDF and125% RDF but at par with 100% RDF + 5 t FYM. Combined effect of sowing of first schedule of baby corn and horse gram and application of 125% RDF + 5 t FYM resulted in significantly higher baby corn-equivalent yield in terms of system productivity (2.8 t/ha) which was comparable to sowing of second schedule with 125% RDF + 5 t FYM (2.7 t/ha), sowing of third schedule with 125% RDF + 5 t FYM (2.3 t/ha), sowing of first schedule with 100% RDF + 5 t FYM (2.7 t/ha), sowing of second schedule with 100% RDF + 5 t FYM (2.5 t/ha) and sowing of first schedule with 125% RDF (2.5 t/ha). Hence, Sowing of baby corn on first schedule (1st July) with 125% RDF + 5 t FYM produced maximum system productivity in terms of baby corn-equivalent yield, net profit and benefit-cost ratio. Since, harvesting large amount of baby corn at a time will deteriorate the quality, marketing problem as well as heavy monetary loss. Based on the present study, sowing of baby corn in different schedules, *i.e.* first (1st week of July), second (2nd week of July) and third (3rd week of July) followed by horse gram as utera crop in combination with 125% RDF + 5 t FYM produced comparable higher net profit, hence, recommended for commercial cultivation at farmers' fields of Northern hills of Chhattisgarh, provided all other scientific management practices are followed.

**Keywords:** Baby corn, Horse gram, Green fodder, Net return, System productivity

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## EFFECT OF CHLORIDE AND SULPHATE DOMINATED SALINITY ON MINERALS CONSTITUENTS OF SENNA (*CASSIA ANGUSTIFOLIA* VAHL.)

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**Abstract**: The present experiment was conducted to study the effect of chloride and sulphate dominated salinity on mineral constituents in leaves of Senna at pod maturity stage, a pot factorial experiment based on randomized complete design with three replicates was conducted in screen house. Four varying EC levels viz. control (without salt), 4, 8 and 12 $dSm^{-1}$ of each salinity types along with nutrients supplemented in sand filled polythene bags. The study revealed that accumulation of sodium in leaves was recorded with the increase of salinity and it was more under sulphate dominated salinity treatment. Potassium on the hand declined with the increment of salinity and the decline was relatively higher under sulphate dominated salinity. Chloride and sulphate in leaves accumulation was found in chloride dominated salinity and sulphate dominated salinity respectively with the increase of salinity levels. The minerals estimated in leaves at the pod maturity stage an increase of their salts in the growing medium. Potassium on the other hand declined due to exchange with sodium.

**Keywords:** Chloride, Sulphate, Minerals, Senna

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## EVALUATION OF ANTIMICROBIAL ACTIVITY OF THE AQUEOUS EXTRACT OF LEMON GRASS AGAINST SELECTED PATHOGENIC BACTERIA

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**Abstract:** In the present study, an antimicrobial activity of the aqueous extract of lemongrass species was assessed using both well diffusion and micro-dilution method in multi-well micro-titer plates. Lemongrass extract investigated for its antibacterial activity against four selected pathogenic bacteria: *Staphylococcus aureus*, *Escherichia coli*, *Salmonella choleraesuis* and *Proteus vulgaris*. Lemongrass extract at different concentrations (1:1, 1:5, 1:10, and 1:20) was active against all tested bacteria and the highest inhibitory effect was observed against *S. aureus* using the well diffusion method. Antibacterial activity of Aqueous extracts of selected commonly used lemongrass were screened against multi drug resistant bacteria, which concludes that their extracts can be used against multi drug resistance bacteria capable of causing both nosocomial and community acquired infections.

**Keywords:** Antimicrobial activity, Extract, Bacteria, Lemon grass

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# EVALUATION OF PLANT PRODUCTS AGAINST TOBACCO CATERPILLAR, *SPODOPTERA LITURE* (FABRICIUS) ON SOYBEAN

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**Abstract:** The tobacco caterpillar, *Spodoptera litura* (Fabricius) is the most serious pest of soybean. Plant products or botanical pesticides are the important alternatives to minimize or replace the use of synthetic pesticides.The present study was conducted during *kharif*, 2016 at S K College of Agriculture and Research Station, Kawardha (Kabirdham) Chhhattisgarh. The experiment was carried out in RBD design with eight treatments and three replications. Tobacco caterpiller, *S. litura* is the most damaging insect pest of soybean. In the evaluation of plant products against *S. litura* NSKE @5% was found second most effective botanicals after recommended insecticide on soybean after both the sprays 1$^{st}$as well 2$^{nd}$ with benefit cost ratio of 1.14.

**Keywords:** Botanicals, Soybean, *Glycine max* (L.), *Spodoptera litura*