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Remote Sensing & GIS Integration in Veterinary, Agricultural and Health Sciences

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Edited By
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Remote Sensing & GIS Integration in Veterinary, Agricultural and Health Sciences

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Preface

Over the past four decades, remote sensing has been continuously providing spatially and temporally consistent observation data with geographic information system (GIS) visualization, applied for monitoring vegetation status, agriculture, biological, health, and veterinary research. Remote sensing has also allowed us to extrapolate from what we know about a few smaller locations to a much larger region. Remote sensing provides various ways of modelling for nature-life interaction system that has been used to answer questions as to how this changing environment has impacted our health, animal health and agriculture production. The changing environment, in return, is having significant consequences on human society, agricultural production systems and veterinary production including rising temperatures and sea levels, and increased frequency of natural disasters and human disease. Remote sensing and GIS hold promise by quantifying spatial and temporal variability of the crop status, guiding management and breeding decisions. In animal production, remote sensing also gained popularity due to its capability of telling both physical and chemical features of land cover. Incorporating longitudinal series of remotely sensed data into models is playing an important role in parameterizing the spatio-temporal process of disease transmission in crops, animals and humans.

Therefore, there is a need to enhance the collaboration among researchers, specific scientific scholars, and academicians to discuss the possible impact and integration of remote sensing and GIS in veterinary, agricultural and health sciences. Taking into account, the Faculty of Veterinary and Animal Sciences, MNS University of Agriculture, Multan, Pakistan has organized an International Conference (Hybrid mode) on "Remote Sensing & GIS Integration in Veterinary, Agricultural & Health Sciences (RGVAHS-2022)" on 23 & 24 February 2022 in collaboration with Eberswalde University for Sustainable Development/ TRANSECT, Germany. This book consolidates the abstracts submitted for presentation in different categories but is not limited to the identification of crop types and monitoring of vegetation status, remote sensing technologies and GIS methodologies of grazing lands, and livestock production, for biodiversity, ecosystem, ecology, and climate change, veterinary, agricultural and human disease modelling incorporating remotely sensed data with GIS visualization and information on disease forecasting and prediction, the impact of climate change on diseases, agriculture, animal, poultry and wildlife production and advanced algorithms and techniques of remote sensing and GIS to solve agricultural problems, animal and human health issues.

Editors

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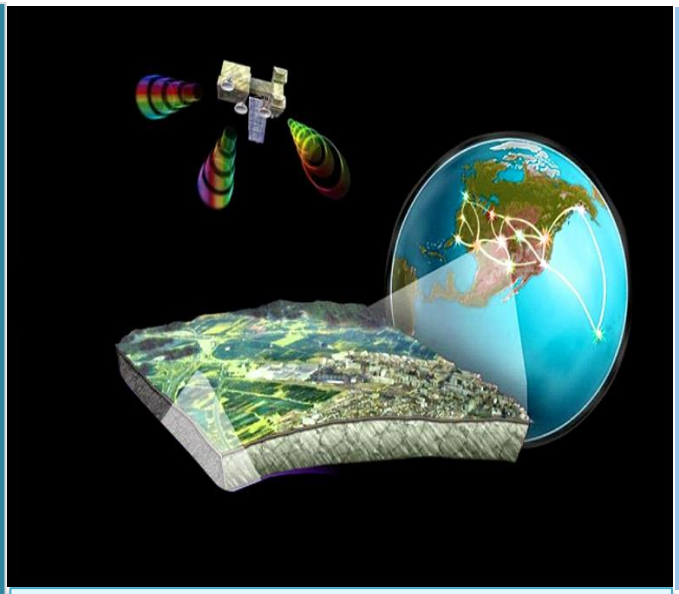

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Dr. Christoph Raab

TRANSECT & Eberswalde University for Sustainable Development, Germany
Topic: Remote sensing of grassland forage quantity and quality to support livestock and habitat management

Professor (J) Dr. Michael Spies

TRANSECT & Eberswalde University for Sustainable Development, Germany
Topic: Integrative perspectives on remote sensing for evaluating glacier dynamics and water scarcity in northern Pakistan

RGVAHS-2022-KP01

Remote sensing of grassland forage quantity and quality to support livestock and habitat management

Dr. Christoph Raab[1]
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ABSTRACT:

Timely information about grassland forage quantity and quality are of pivotal importance for the active grazing management of herbivores. Forage quality depends on several chemical and physical biomass characteristics, but spatial explicit information covering large areas is not commonly available. Remote sensing offers real opportunities to provide such information on repeated intervals, to support for example the decision in supplementary feeding or pasture rotation. This presentation uses a case study from a semi-natural grassland area grazed by wild, large herbivores in Germany, to illustrate how remote sensing can support livestock and habitat management.

Keywords: Forages, Herbivores, Remote sensing, Habitat management

RGVAHS-2022-KP02

Integrative perspectives on remote sensing for evaluating glacier dynamics and water scarcity in northern Pakistan

Dr. Michael Spies[1]
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ABSTRACT:

The presentation offers an introduction to remote sensing-based research on glacier dynamics in the upper Indus Basin, Pakistan. It discusses (a) how these approaches can help to better understand current and future challenges related to water availability for irrigation, and (b) how their limitations can be overcome by combining them with other research methods. As Pakistan has a high dependence on glacier melt water for irrigation, any changes in glacier mass balance are crucial for the future of agriculture in the country. This not only applies to the vast irrigated Indus plains, but also to the mountain areas where farmers critically depend on these ice masses. Remote sensing experts use different approaches to evaluate glacier changes: first,

drawing on medium-resolution satellite imagery from Landsat or Sentinel, semi-automatic approaches can map glacier extent and their dynamics over time. Second, with the help of digital elevation models derived from radar missions or stereo imagery, changes in glacier mass balance can be quantified. This allows for making future projections of melt water availability in times of climate change. These approaches are instrumental for larger-scale assessments of glacier mass change and their long-term impacts on water availability. However, they have limitations for analyses on the local scale: here, integrated approaches combining remote sensing with manual mapping and field surveys can be meaningfully applied to allow for more fine-grained assessments of local processes and to identify and evaluate appropriate adaptation strategies.

Keywords: Remote sensing, Glacier, Northern Pakistan

RGVAHS-2022-OP01

Remote sensing and geographic information systems can be used to help manage livestock. A review

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ABSTRACT:

Processing, editing, and managing geographic data in a computerized environment are some of the things this GIS does. It is also called a system of hardware and software that is used to store, retrieve, map, and analyze geographic data. Using common geography, it is possible to connect entities that are spread out across the world and their attributes. People use remote sensing to learn about things that aren't right next to them, like an object, area, or phenomenon. They do this by analyzing data from a device that isn't in contact with the object, area, or phenomenon under investigation. Remote sensing (RS) is based on the measurement of electromagnetic (EM) energy that objects emit. Some of this (EM energy) can come in a lot of different forms. EM energy comes mostly from the Sun, which is the most important source on Earth. When RS and GIS are combined, we can get a real-time â€˜birds eye viewâ€™ of large areas that attribute a spatial dataset to just about anything and monitor changes over time and space which combine/overlay various datasets from different disciplines ad make informed decisions and optimize the way we manage livestock. GPS collars could provide information on

grazing locations, activity patterns, and environmental data. Animals can be tracked on a 24-hour basis using GPS receivers which are used to track cattle during the summer, fall, and winter. RS/GIS represents a new technology in livestock management for the reporting of livestock monitoring, inventory, epidemiology, distribution, information, as well as the study and modeling of specific disease problems.

Keywords: GIS, RS, Tracking, Livestock management, Disease control

RGVAHS-2022-OP02

Remote sensing application for drought hazard assessment in the coastal region of Pakistan

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ABSTRACT:

The agricultural sector of Pakistan is severely affected by the consequence of climate change during the last couple of decades. In this study, the severity of different types of drought-like meteorological, hydrological and agricultural drought was assessed in the Lasbela and Gwadar coastal districts of Pakistan during the 1991─2020 period. Standardized Precipitation Index (SPI) and Standardized Precipitation Evapotranspiration Index (SPEI) indices were used for the assessment of meteorological drought, Streamflow Drought Index (SDI) index for the assessment of hydrological drought and Vegetation Condition Index (VCI), Temperature Condition Index (TCI), and Vegetation Health Index (VHI) indices for the assessment of agricultural drought. Ground-based, remote sensing and Global Climate Models (GCMs) datasets were analyzed in R-programming language, DrinC, and in cloud computing platform Google Earth Engine (GEE). According to results of meteorological indices at different timescale, years from 1999 to 2003 were severe dry to extremely dry and 1994 to 1996, 2010, and 2019 were observed a very wet to extremely wet. The SDI exhibited moderate drought in the hydrological years 1992−1993, 1998−1999, 2013−2014, 2019−2020, while mild drought was observed during 2002−2003. The VCI index indicated 2001 as a severe dry year while 2002, 2003, 2004, 2006, 2008, and 2018 as moderate dry years. According to the VHI analysis, the vegetation appeared to be severely affected during the drought years of 2001 and 2002, while a moderate drought was

observed during the 2003-2018 period. The increase in the meteorological drought resulted in exaggerating the hydrological drought hazard, which had ultimately impacted the agriculture of the Lasbela and Gwadar districts. However, implications of anthropogenic activities like overexploitation of groundwater, increasing water use, and poor socioeconomic conditions of the communities need in-depth research for sustainable agriculture and livelihoods on a long-term basis in this region in the future.

Keywords: Remote sensing, Hazard assessment, Coastal region, Pakistan

RGVAHS-2022-OP03

Implication of remotely sensed vs climate data in assessing crop water ingestion using machine learning

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ABSTRACT:

Pakistan possesses an agriculture-based economy and in general, its agricultural production is relatively increased during the last decade. Pakistan agricultural industry is a major contributor to its GDP. It fulfills almost all of the 90% food and fiber requirements. Still, there is a big gap when compared with many countries of the world due lacks to its poor resource management. Irrigated agriculture in Pakistan consumes 93 percent of the available water resources whereas more than 60 percent of irrigation water is lost during the conveyance and application in the field. The major reason for application losses is the lack of knowledge about irrigation scheduling. Other factors are the ever-growing population, urbanization, industrialization, and inadequate storage. Estimation of Crop Water Requirement (CWR) is a basic tool in water resources management that is based on crop evapotranspiration (ET) estimation. Several methods for the estimation of crop ET are being used by various researchers, which have their deficiencies. Under this study, two well-known and most reliable methods i.e., SEBAL and CROPWAT, which use satellite data and climatic data respectively, were tested.

Both methods were applied to the estimation of wheat crop ET on the entire district of Peshawar and results were compared to provide the sound basis for ET estimation. It has been observed that both results were comparable with minor deviations. CROPWAT requires a lot of climatic parameters that are difficult to collect due to the involvement of huge labor and instrumentations. To avoid the collection of these data, satellite-based estimation of crop ET through energy balance equation is easy and it gives an actual on-ground estimation of crop ET. This study testifies that satellite base ET estimation is cost-effective, easy to apply and gives more reliable results.

Keywords: CROPWAT, SEBAL, Evapotranspiration, Remote sensing, Crop Water Requirements (CWR), Crop ET

RGVAHS-2022-OP04

Analyzing vegetation and climate change dynamics through remote sensing in Khyber Pakhtunkhwa

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ABSTRACT:

During the past three decades, climate and land-use changes have resulted in significant changes in vegetation cover. Sustainable management requires optimum analysis of differences in the forest, grassland, agricultural, and built-up land covers to protect land resources and minimize climate change impacts. Recent advances in remote sensing technologies offer a viable approach to assessing land use and climate trends over long periods. In this study, we examine changes in vegetation cover through the assessment of normalized difference vegetation index (NDVI) over Khyber Pakhtunkhwa in Pakistan. We apply NASA Global Inventory Modeling and Mapping Studies (GIMMS) data to monitor changes in land cover from 1981 through 2010. In addition, we used meteorological datasets from NCEP Climate Forecast System Reanalysis (CFSR) and Multi-Source Weighted-Ensemble Precipitation (MSWEP) to examine vegetation dynamics concerning changes in precipitation and temperature over the region. Several matrices, including Pixel Dimidiate Model, Intensity Analysis, Trend Analysis, and Residual Analysis, are

employed to detect seasonal and interannual trends in the NDVI. Variations in the NDVI corresponding to the fluctuations in precipitation and temperatures, and the residual changes due to anthropogenic activities, are subsequently evaluated. The study also investigates trends in different land-use types, such as forest, agriculture, and barren soil, over different climatic zones in the province.

Keywords: NDVI, Remote sensing, Land cover, Climate change, Khyber Pakhtunkhwa, Precipitation

RGVAHS-2022-OP05

Effects of stressors on cortisol level and hematological parameters of Rainbow trout *Oncorhynchus mykiss*

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ABSTRACT:

In aquaculture, a fish is exposed to a single or combination of stressors. The presence of chronic stressors and failure of fish species to acclimatize results in a condition known as allostatic overload and consequently chronic illness. Stress can reduce growth performance and feed utilization efficiency, impair the immune system and weaken the reproductive capacity of farmed fish. Reducing stress is, therefore, desirable to improve the health and productivity of fish species in aquaculture. Cortisol is believed to be the main hormone mediating the physiological stress response. Typically, the plasma cortisol level rises rapidly, just a few minutes after exposure to an acute stressor. The present study attempted to measure the cortisol level as well as hematological parameters as an indicator of the stress response, in rainbow trout exposed to different stressors including handling, overcrowding, contaminants, hypoxia, and hyperthermia. Cortisol level and blood cells in peripheral blood were assessed through ELISA and complete blood count (CBC) tests, respectively. Results showed an elevated cortisol level in stressed fishes (test groups) as compared to unstressed fishes (control). The red blood cell count (RBC) and hemoglobin level increased after exposure of fish to stressors. Similarly, white blood cells

(WBC) and lymphocytes range were increased as the fish were exposed to various stressors.

Keywords: Stress, Cortisol, Rainbow trout, Hematology

RGVAHS-2022-OP06

Detection and seasonal prevalence of *Eimeria* oocysts in different Tehsils of District Mianwali, Punjab, Pakistan

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ABSTRACT:

Rural poultry has created direct and indirect opportunities for employment of poor communities in backward areas like Mianwali, thus contributing a major role in poverty alleviation. Coccidiosis is a protozoan, infectious, and most prevalent disease which is caused by the genus *Eimeria*. Depending upon its various species, *Eimeria* localizes different parts of the intestine and leads to blood-stained diarrhea, weight loss, and death in birds. Objective: Since there was no published data related to coccidiosis in the Mianwali district, a cross-sectional survey was conducted from January 2020 to December 2020 for identification, isolation, and estimation of the seasonal prevalence of different *Eimeria* oocysts along with potential risk factors (age, breed, body condition and management). A total of 600 fecal samples were collected from different rural poultry farms located in three tehsils (Isa Khel, Mianwali, Piplan). Floatation, sedimentation, and Mac-Master techniques were implied for the detection of *Emeria* oocytes. Overall prevalence of coccidiosis was 32.3%. Four species (*E. tenella, E. acervulina, E. maxima*, and *E. necatrix*) were identified. Maximum infection of *E. tenella* (8.14 %) was found in the whole district. Birds in tehsil Mianwali were with the highest infection (45.9

%) leaving behind tehsil Piplan (38 %) and tehsil Isa Khel (16 %). It revealed from data that young chickens (2-8 weeks age) got more infection (19.6 %) than adult ones (more than 8 weeks age) 12.9 %. High infection in broiler chicks (20.1 %) and weak birds (21.33 %) was observed than desi breed (12 %) and healthy birds (11 %) respectively. Poultry birds reared under the intensive system affected more (25.2 %) than those under the extensive one (7.2 %). A study on the prevalence of coccidiosis in different months of the year showed the highest infection in the summer season, especially in July and August, and the lowest in March. It was concluded that the risk factors associated with coccidiosis should be taken into account in designing the prevention and control regimen.

Keywords: Rural Poultry, Mianwali, *Eimeria*, Risk factors

RGVAHS-2022-OP07

Effect of body mass index and cardiorespiratory fitness against Catecholamine-induced oxidative stress in sports sciences in Punjab

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ABSTRACT:

This study aims to explore the correlates such as (Blood pressure, heart rate, oxygen saturation, temperature, and respiration rate) of the department of supports sciences that are directly associated with body mass index (BMI) and cardiorespiratory fitness (CRF). Randomize control trial. Place and duration of study: This cross-sectional study was conducted from October to December 2020 at Ali-Ul-Murtaza, Department of Rehabilitation Sciences, Muhammad Institute of Medical and Allied Sciences Multan, Pakistan. 334 undergraduate female physiotherapists of 17-25 years were included in this study. Participants were assessed using PAR-Q, and standardized criteria of cardiorespiratory fitness. For data analysis, SPSS 23 was used in this study. There were 334 subjects with a mean age of 20.89Â±1.66 years. Of the total,

200 (59.88) students were overweight and 34 (10.17) were underweight. Overall 83 (24.9) reported good quality of life and 194 (58.1) were satisfied with their general health. There was a highly significant positive correlation in overweight and negative correlation in underweight final year students of sports sciences of Punjab region. P-value was (0.05 each). The conclusion of the study is the frequency of over-weight final year students of sports sciences was high and the frequency of underweight sports sciences was low in the Multan region.

Keywords: Cardiorespiratory fitness, Body mass index, Treadmill exercise

RGVAHS-2022-OP08

Obese gut microbiota and modified diet interaction with metabolic Endotoxemia in mice

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ABSTRACT:

Metabolic endotoxemia is a state of an increased level of lipopolysaccharides (LPS) or endotoxins in the blood. During this condition, proinflammatory molecules such as interleukin-1, interleukin-6, tumor necrosis factors (TNF-α) are increasingly expressed. This study was aimed to investigate the effect of cultured gut microbiota (GM) from obese humans coupled with HFD in inducing metabolic endotoxemia in humanized mice. In total, 30 strains were isolated from 10 stool samples of obese patients. Following morphological and biochemical *characterization, 16S rRNA gene sequencing of six abundant isolates* identified these *Klebsiella aerogenes*, *Levilactobacillus Brevis*, *Escherichia coli*, *Staphylococcus aureus*, *Bacillus cereus,* and *Bacillus subtilis* (MZ052089- MZ052094). *In vivo* trial using the above isolates, known as human gut microbiota (HGM), was performed for six months. Sixteen mice were distributed into four groups *i.e.*, G1 (control) mice fed with chow diet, group 2 (G2) with HFD, group 3 (G3) with HFD + HGM, and group 4 (G4) with chow diet + HGM. Body mass index (BMI) and plasma endotoxins were measured pre and post-experiment. *In vivo* study revealed that HFD + HGM caused a significant increase (3.9 g/cm at 20 weeks) in the body weight and BMI (0.4 g/cm post-experiment) of G3 mice compared to the other groups. One-way ANOVA showed a significantly higher level of endotoxins (2.41, 4.08, and 3.7 mmol/l) in mice groups G2, G3, and G4, respectively, indicating the onset of metabolic endotoxemia. Cecal contents of experimental mice

groups showed a shift in microbial diversity as observed by all isolates belonging to either *Firmicutes* or *Bacteriodetes* phyla, respectively**.** In conclusion, the current study reported that minor alteration in GM composition through HFD feeding and cultured GM transfer has a significant impact on the development of metabolic endotoxemia, possibly via modified intestinal permeability.

Keywords: Gut microbiota, High fat diet, Obesity, Metabolic endotoxemia, Mice

RGVAHS-2022-OP09

Early diagnosis of viral disease in poultry chicken using deep learning

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ABSTRACT:

The occurrence of poultry diseases can seriously threaten human health. Even though the quantity and density of poultry rearing are high, monitoring of poultry diseases is still based on manual observation. The poultry farmers depend on experts to diagnose and identify chicken diseases. Due to this, the farmers lose many chickens due to late diagnoses and a lack of reliable experts. However, with the advancement in Artificial Intelligence, the common disease in chicken can be identified using images of chicken. In this study, we trained deep learning models based on Convolutional Neural Network to identify the disease in chicken from two classes healthy and viral from images. We use Single Shot Detector (SSD) and Resnet34 to detect the disease. The results show that the SSD method has overall performance and the highest prediction accuracy on both classes (viral, healthy), also suitable for chicken disease detection. SSD gives 98% accuracy and Resnet34 gives 97% accuracy.

Keywords: Avian influenza, Deep learning, CNN, Classification, Single Shot Detector (SSD), ResNet

RGVAHS-2022-OP10

Isolation of plastic degrading microorganisms from waste dumpsites

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ABSTRACT:

Plastic pollution is a threat to the environment because of its slow degradation rate and high usage. The continuous accumulation of these synthetic plastic wastes poses an ever-increasing threat to animals, humans, and the environment, and the use of microorganisms to effectively degrade plastic waste can provide a solution to the problem of plastic pollution. This study aims to isolate plastic degrading microorganisms from soils. The soil samples used for this study were collected from dumpsites filled with plastic and plastic materials and the effectiveness of the degradation of plastic materials was studied over six (6) weeks in broth and agar culture under laboratory conditions by weight determination method. Physicochemical and microbiological analysis was carried out on the various soil samples using standard protocols. The biodegradation of polyvinylchloride (PVC) was done in-vitro using the microorganisms isolated from the soil. Microorganisms that we're able to degrade a higher percentage of the plastic materials were; *Staphylococcus aureus*, *Streptococcus sp*, *Bacillus sp*, *Escherichia coli*, *Aspergillus niger*, *Aspergillus flavus*, and *Trichoderma viridae*. The total viable count for bacteria and fungi were within the range of 11.8x105 to 2.0x1010 and 3.3x105 to 0.1x1011 respectively. *Staphylococcus aureus*, *Streptococcus sp*, *Bacillus sp*, *Micrococcus sp*, *Aspergillus niger*, *Aspergillus flavus*, and *Trichoderma viridae*, degraded plastic up to 25%, 31.2%, 25% 31.2%, 12%, 10%, and 10%, respectively. These isolates may be used to actively degrade plastics, thereby reducing the rate of plastic pollution in our ecosystem.

Keywords: Biodegradation, Plastic, Pollution, Polyvinyl chloride, Wastes

RGVAHS-2022-OP11

Remote Sensing: Land cover mapping of agricultural areas of Multan and Bahawalpur

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ABSTRACT:

Land Use Land Cover change has several impacts on human beings, the environment, and the economy of a country. In this study, we derived a crop type ground truth dataset for land cover classification in Punjab Province of Pakistan, especially Multan and Bahawalpur. The agricultural land cover mapping was focused on cotton, as this cash crop plays an important role in the economy of Pakistan. Preliminary results indicate that Multan is an area in which cotton production already shifted to a more diversified agricultural land use. For Bahawalpur, the results were less clear. The causes, effects, and other information about the agrarian transformation will be evaluated with the support of local farmers of each area in the future.

Keywords: Remote sensing, Land cover mapping, Agricultural

RGVAHS-2022-OP12

Maximizing irrigation efficiencies of border irrigation under clay soil conditions using simulation model

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ABSTRACT:

Optimum combination of design variables of border irrigation system is inevitable to enhance the overall efficiency of irrigation system. Present study was carried out to evaluate the performance of SIRMOD (Surface IRrigation computer simulation MODEL software for finding the optimum combinations of three design variables for widely used blocked-end border

irrigation in Pakistan i.e., border size (length x width), inflow rate and cutoff time at maximum irrigation efficiencies. Borders with the size of 30m × 20m were prepared. The experiment was conducted with continuous flow regime condition and a cut-throat flume having size of 1.80 ft × 0.8" was used to determine the discharge. Pertinent hydraulic data of borders were recorded for three irrigation events. The SIRMOD model was assessed in terms of advance trajectories, recession trajectories and infiltrated volume. The model predicted almost same results for advance time (R2=0.9996, RMSE=0.0356, SE=0.0416), recession time (R2=0.9901, RMSE=0.1296, SE=0.0895), and infiltrated volume (R2=0.9996, RMSE=0.0481, SE=0.0559). Several combinations of design variables were evaluated considering farmer's practices and recommendations of Research Institute. The combinations include: (a) border size, inflow rate and variable cutoff time (b) fixed cutoff time (10 mints), and (c) varying design variables to apply depth of 75 mm for wheat crop. Results indicated that, the overall efficiencies under existing practice of farmers were lower and warrants improvement. The different combinations simulated through SIRMOD showed the maximization of efficiencies for the management practices using the average infiltration function indicated that the border length can be changed in the range of 20m x 10m to 65m x 55m for inflow rate ranging between 2.54 to 7.70 lps, respectively, by keeping cutoff time constant at 10 mins.

Keywords: Optimizing irrigation efficiencies, Improving border irrigation, Designing border irrigation variables

RGVAHS-2022-OP13

Crop health analysis via Quadcopter based on remote sensing

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ABSTRACT:

The design and Assembly to produce a Remote Sensing unmanned aerial vehicle (UAV) system that is capable of Crop health Analysis. This project aimed to provide an economically sustainable solution to the problems in the agricultural fields for the local level farmers to have easy access and inspection of the crops in unapproachable areas of the field and analyze the crop

health. All of the aspects of the design are directed towards maximizing the efficiency and time of flight of Quadcopter. The concept of design was to build a remotely controllable quadcopter with a Geo NDVI Camera for the crop health analysis, which will be performed by first capturing the data (spectrum) from the field with the help of Geo NDVI camera, by taking the drone over the fields and then analyzing them through image processing technique and implementing various NDVI algorithms on them. Further by comparing the ideal spectrum of the different types of crops in terms of Vegetation Indices with the analyzed data, we can determine by deviation, that how much the crops are to be further treated and to take care of them on time. Economically, this project cost about 15 million PKR internationally and we make it possible within 2.5 million PKR which is easy to afford by local farmers to improve their crop production of different crops like rice, wheat, sugarcane, etc.

Keywords: UAV, Remote sensing, Image processing techniques, Geo NDVI camera, NDVI algorithms, Spectrum, Vegetation indices, Efficiency

RGVAHS-2022-OP14

Evaluation of the therapeutic potential of isometric exercises with and without diclofenac potassium spray in plantar fasciitis

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ABSTRACT:

The diclofenac is 2-[2-(2, 6-dichloroanilino) phenyl]acetic acid] . The single-blinded Randomized controlled study aims to assess the Evaluation of the therapeutic potential of isometric exercises with and without diclofenac potassium spray in plantar fasciitis.30 patients was selected who meet the inclusion criteria and randomized into two groups, Group-A treated with isometric exercises and Phonophoresis with 4-pumps of diclofenac potassium spray performed 4 weeks period for 3 times per week session lasted 5-7min. Group-B was treated with isometric exercises alone. The patients were assessed by (NPRS). Data were analyzed by using SPSS version22. Statistical analysis showed that results obtained after treatment of Group-A (Treatment group) were more significant ($p<0.03$) than Group-B (Control group) treated

populations ($p<0.07$). Isometric exercises along with diclofenac potassium spray proved more beneficial than isometric exercises alone.

Keywords: Plantar fasciitis, Phonophoresis, Isometric exercises, Diclofenac potassium spray

RGVAHS-2022-OP15

Rehabilitation/Preservation of community ponds for livestock in villages using satellite remote sensing

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ABSTRACT:

Community ponds have been considered as an important source of rainwater storage in rural areas. These ponds are used to provide a surface water source for livestock farmers especially buffalo producers in Pakistan. Such community ponds have been drastically reduced in numbers over the last two decades, reflected through their vanishing spatial presence. In a recent study at UVAS, the quantification of groundwater usage for livestock has been done in the district Okara, of Punjab and it was found that the farmers having access to surface water sources used significantly less groundwater (77 ± 10 L/buffalo) compared to those who did not have this provision (120 ± 5, Mean ± SE). Considering the importance of such surface water sources, the rehabilitation of community ponds becomes the need of the hour. Satellite remote sensing can play a vital role in identifying the location and trends of community ponds using historic data for the last two decades. Satellite data of Landsat and EO-1, ALI (Advanced Land Imager) providing 10-30 m resolution would be used work to identify and spot community ponds. The findings thus generated would be shared with the On-Farm Water Management program of the Agriculture Department. This collaboration would play a vital role to rehabilitate the lost community ponds and preserving the existing ones. It will not only preserve the rainwater storage capacity but also lower the stress on groundwater reserves of the country, especially in the Punjab province.

Keywords: Rehabilitation, Preservation, Satellite remote sensing

RGVAHS-2022-OP16

In-vitro anthelmintic efficacy of essential oils of *citrus medica* L. and *citrus Sinensis* L. against sheep gastrointestinal nematodes

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ABSTRACT:

The management of infections caused by sheep gastrointestinal nematodes (GINs) is a challenging task due to the development of anthelmintic resistance on commercial drugs. The urgency of the situation justifies the search for alternatives, which includes plant essential oils (EOs). This study aimed to evaluate the *in vitro* effect of two EOs, *Citrus medica* L. and *Citrus sinensis* L. by using the egg hatch test (EHT). For both tested EOs, EHT was performed at eight concentrations: 50, 12.5, 3.125, 0.781, 0.195, 0.049, 0.025 and 0.0125 mg/mL. The positive control was thiabendazole at the two lowest concentrations used for tested samples, and the negative controls were 3% (v/v) Tween 80 and distilled water. Both tested samples showed ovicidal potential against sheep GINs with inhibition of egg hatchability varied from 12.3-95.0% and 14.7-86.3% for EOs of *C. medica* and *C. sinensis*, respectively. For the positive control, results varied from 95.0-96.3%, for the 3% Tween 9.0-14.7%, and distilled water 4.0-4.7%. The chemical composition of EOs was determined by GC-MS. The results showed that the main ingredients of *C. medica* EO were limonene (75.58%), β-pinene (11.57%), and γ-terpinene (8.66%), and of *C. sinensis* were limonene (96.13%), trans-limonene oxide (1.31%) and cis-limonene oxide (1.21%). The obtained results suggest that the plant members of genus *Citrus* have an anthelmintic potential that origin from a high percentage of limonene, and may play important role in the future approaches designed for nematode control in animals. Further *in vivo* studies should be performed to confirm these findings.

Keywords: Anthelmintic resistance, Essential oil, *Citrus*, GC-MS, Gastrointestinal nematodes

RGVAHS-2022-OP17

Glacier lakes dynamics under warming climate in Hunza river basin, Pakistan

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ABSTRACT:

Extracting the glaciers lake surfaces with remote sensing imagery has been important in glaciered regions. Glaciers lakes are still threats to infrastructure, livelihood and local community. One of the most difficult task is to distinguish the glaciers, glaciers lakes and dry from dry land. Remote sensing imagery is most widely used for water resources in remote area and monotonious regions. Several techniques were used to extract the glaciers lake surface using Landsat imagery. In this study, the glaciers lakes were extracted by normalized different water index. The Landsat 8 datasets are used to extract the glaciers lakes surface for 2018 in Hunza River Basin, Pakistn. The numbers of glacial lakes in Hunza were found 110 in 2001, which increased in 2005 upto 141. During the 2001, the one major lake was found to be glaciers lakes outburst flood history. Similarly, it was found the noticeable increased in glaciers lakes from 2001 to 2005. During the 2013, the glaciers lakes expansion found to be decreased but increased the lakes. Recently, glaciers lakes are increased as compared to 2005. The number of major lakes in 2018 found increasing trends in 2005 and 2018. The expansion major Glaciers lakes outburst flood lake in 2018 increased as compared to 2005 based on the empirical approach. During the may-June, 2018, similar lake is going to generate near to hassanaabd like Attabad lake, which can damage the downstream population as well as infrastructure. Therefore, warming climate increased the glaciers lakes dynamics and its outburst. Disaster management authority should monitor and protect the population of downstream.

Keywords: Glacier lakes dynamics, Warming climate, Hunza river basin, Pakistan

RGVAHS-2022-OP18

Role of Moringa leaf extract and sodium nitroprusside for improving growth, water status, and physiological attributes in narcissus under water stress

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ABSTRACT:

Narcissus is an important flower that is seriously affected by water deficit conditions that can be ameliorated by the application of plant extracts and plant growth regulators. Different plant-based and chemical stimulants are used to reduce the impact of water stress. Therefore, the present study was planned to evaluate the role of moringa leaf extract and sodium nitroprusside for improving growth, water status, and physiological attributes in narcissus under water stress. Healthy similar size bulbs of narcissus were grown in earthen pots under normal (100% field capacity) and water stress (60% field capacity) conditions and different levels of moringa leaf extract and sodium nitroprusside were applied through foliar application. The study was designed according to the Complete Randomized Design (CRD) with two factor-factorial using five treatments each treatment has 3 replications. Data of different morphological, physiological, and biochemical attributes were recorded. Moringa leaf extract application significantly improved plant fresh and dry weights, pigments, relative water contents, gaseous exchange, and enzymatic activities under water stress. Thus, moringa leaf extract can be effective in increasing growth, water status, and physiological parameters of narcissus under water deficit conditions.

Keywords: Cut flowers, Drought, Floriculture, Plant growth regulators, Water relation

RGVAH-2022-OP19

Spatio-temporally analyzing impact of climate change on the rice crop yields: A case of District Gujranwala, Punjab

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ABSTRACT:

Climate change is a global phenomenon, yet the developing and the least developed countries are more prone to climatic change. Over the last three decades, extensive climate change observed in rural and urban Punjab affected the crop growing conditions, i.e., evapotranspiration and minimum and maximum temperatures. The study aims to investigate the national and international repositories on the weather data to quantify the overall climate change during the past ten years. We investigated the national and international repositories on crop statistics and quantified the change in crop yield patterns in space and time. Finally, we empirically found relationships between the quantified change and crop yield patterns. Thus, we investigated how the Spatio-temporal patterns of climate change impact rice crop yields. To do so, we obtained the MODIS NDVI time series for the period 2005-2018. The time series was stacked, re-projected, and classified to identify various crops classes in the study area. Data on rainfall and temperature were obtained from Pakistan Meteorological Department (PMD), Pakistan. For this period, the crop statistical data were obtained from Pakistan Agricultural Department (PAD) to link the crop classes in the classified image to the rice crop. The global Ordinary Least Square (OLS) and the fixed effect (FE), temporal random-effect (RE) panel models were used to investigate whether the spatial and temporal variations in the crop yields are due to that variation in the climate variables. The results show that the change in climatic variables significantly impacts the rice crop yield variations. By incorporating the fixed effects, the FE model outperformed the OLS model (0.339 Vs. 0.272) with a significant F-test ($p < 0.0001$). Moreover, the FE model improves the RE model (R2 0.339 Vs. 0.337). This research concludes that the spatial and temporal variations of the rice crop are highly induced from those variations in the climate variables during the period 2005-2015. We suggest the local rice farmers adopt this change in the rice crop calendar.

Keywords: Multispectral remote sensing, Rice crop yield, Spatiotemporal change detection, Climate change impact

RGVAH-2022-OP20

Effects of inequality of access in irrigation water on paddy yield and water productivity in the Kano River Irrigation Project (KRIP), Nigeria

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ABSTRACT:

Inequality in access to irrigation water and its impact on crop production in many large-scale irrigation projects are primarily tied to the hydrological position of the farms (head, middle, and tail-end users). However, few studies have been conducted in Nigeria to examine the extent of inequality in large-scale irrigation projects. This study was undertaken to investigate equity in irrigation water use and its impacts on paddy yield and water productivity in the head, middle, and tail-end of the Kano River Irrigation Project. Two hundred and twenty-five (225) respondents were targeted for data collection from February- to June 2021. Similarly, data were analyzed using Kruskal-Wallis test, Post-Hoc test, Physical water productivity, Gini coefficients, and Logit model. The results indicated that downstream farmers have the lowest mean yield (1625 kg/acre), access to irrigation water, and irrigation water use (2430 m3/acre). However, they have the highest water productivity (0.66kg/m3) against 0.44kg/m3 and 0.58kg/m3 for middle and head farms, respectively. The finding also indicated the Gini- coefficient of 31%, 18%, and 24%, respectively, for irrigation water use across locations, access to water across the three locations, and access between tail-end and head. The multiple logistic regression analysis results showed that farms locations, the quantity of irrigation water, access to irrigation water, and training on water use were statistically significant, with varying odds ratios indicating their probability of increased yield. The findings suggest that initiatives to enhance rural poor lives should consider the distributional features of irrigation interventions in such a way as to ensure relatively equitable distribution of the volume of irrigation water across farms locations throughout the system.

Keywords: Paddy yield, Water productivity, Irrigation water, Inequality, Nigeria

RGVAHS-2022-OP21

Chilean Patagonian lakes and northern coastal bays and potential application of Integrated Coastal Zone Management (ICZM)

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ABSTRACT:

The use of remote sensing techniques applied to aquatic ecology was described in papers related to the management of water quality, mainly to avoid toxic algal proliferation, these ecological events are caused mainly by human alterations in the surrounding basins. The present study aimed to revise two cases in Chile the first was a comparison of two north Patagonian lakes one with marked human intervention due to towns in their basins, and one with very low human intervention; the second case was a comparison of two periods in Antofagasta bay, in a zone with a town in its coast. The results revealed in the first case the existence of marked associations between spectral properties (LANDSAT OLI) and limnological properties, existing marked differences in Villarrica Lake with human intervention, and Caburgua lake that has a low human intervention. For data of Antofagasta bay in two summer periods, were observed marked associations in spectral properties (LANDSAT OLI) and plankton composition, for both sampled periods, and simultaneously for sites close to the coast. These differences are caused mainly for human intervention in the respective surrounding basins such as towns, industries that would have marked influence in the associated marine or inland aquatic ecosystem.

Keywords: Remote sensing, Oceanography, Limnology, Trophic status, Plankton, Coastal management, Basins

RGVAHS-2022-PP1

Impact of climate change and COVID-19 on deadly infectious disease: Tuberculosis

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ABSTRACT:

Tuberculosis (TB) continues to pose a worldwide threat as 1/3 of the world population is infected with TB; 10 million people develop active TB & a total of 1.5 million people died from TB in 2020. Worldwide, TB is the 13th leading cause of death and the second leading infectious killer after COVID-19. WHO analyzed data from 84 countries that showed the COVID-19 pandemic has caused colossal health, social and economic impacts. In the perspective of the global TB epidemic, COVID-19 threatens to quash current improvement towards global TB targets. Provisional data compiled by the World Health Organization (WHO) from 84 countries indicates that an estimated 1.4 million fewer people received care for TB in 2020 than in 2019 - a reduction of 21% from 2019. One of the factors that have an impact on life and threaten human health is 'climate'. Infectious disease variety can be affected by climate change and will increase when the risk of transmission. One of them is TB has become equally interesting monitoring along with sympathizer data from various studies in various construction and arrangement. Climate change affects TB through diverse pathways: changes in climatic factors like temperature, humidity, and precipitation influence host response through alterations in vitamin D distribution, malnutrition, ultraviolet radiation, and other risk factors. The mount in intense climatic events induces population displacement resulting in a greater number of vulnerable and risk populations of tuberculosis. It creates a conductive environment of TB transmission and development of active TB and disrupts TB diagnosis and treatment services. There has been much change in the distribution of tuberculosis recently as a result of climate changes which have resulted in various mutations which have taken place in the mycobacterium strains. Therefore, Scientists are trying to identify these resistant strains and as well compound new drugs that can be used to cure TB. Tuberculosis notifications in India as a case study shows a seasonal pattern, with a peak during March, April, May, October, and December. New tuberculosis strains are discovered through these periods which fall during the spring season in

India. Climate change brings about a seasonal pattern of Tuberculosis for newly diagnosed smear-positive cases with varying degrees of change. These observations suggest the presence of a seasonal disease-modifying factor. The regulation of peak seasonality in Tuberculosis case detection may prove to be useful to initiate measures for a better implementation of control. Therefore, it stands to reason that climate change affects tuberculosis, particularly in highly vulnerable countries and areas. However, further studies and novel methodologies are required to address such a complex relationship and better understand the occurrence of tuberculosis attributable to climate change. It is vital to comprehend the connection between TB incidence and weather factors to develop proper intervention programs.

Keywords: Tuberculosis, COVID-19, Climate change, Resistant

RGVAHS-2022-PP2

Trends and geographical distribution of Lassa fever in Nigeria

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ABSTRACT:

Lassa hemorrhagic fever popularly known as Lassa fever is a zoonotic infection caused by Lassa mammarenavirus (LASV). The virus spread through the feces and urine of *Mastomys natalensis*, a type of African rat that lives in and around human habitation. An estimated annual incidence of 897,700 occurs across West Africa and around 15 percent of all hospitalizations for the disease end in death. Though Lassa fever is endemic to areas near the Western and Eastern extremes of West Africa, there were 35 reported cases of its exportation to nine countries in Europe, Asia, South Africa, and North America. The study was aimed at examining the spread and trend of Lassa fever in Nigeria from December 2016 - to December 2021. Data for the study were sourced from secondary sources. The virus was first reported in Nigeria in 1969. Since then, Nigeria has continued to report some cases and outbreaks during the dry season, often between November and May annually. However, in recent years cases of Lassa fever occur throughout the year. Nigeria witnessed the onset of a major outbreak of Lassa fever in Dec. 2016 with a total of 30 confirmed cases out of 37 suspected cases and 14 deaths with a case fatality rate for confirmed/probable cases of 51.4% in nine States. In 2021 the death toll rises to 102 with

total confirmed cases of 510 out of 4654 suspected cases and a case fatality rate of 20.0% in 17 States. However, the figures are lower than the ones reported for the same period in 2020 (244 death with a case fatality rate of 20.5% and 1189 confirmed cases out of 6791 suspected cases in 27 States). The data emphasize the need for rapid response to contain the virus since the disease is contagious to avoid pandemics similar to COVID-19.

Keywords: Case fatality rate, Confirmed cases, Lassa fever, Outbreak, Suspected cases, Zoonotic disease

RGVAH-2022-PP3

Trend of AMR and relative spread of hospital acquired infection by Carbapenem-Resistant *A. baumannii* in Bangladesh

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ABSTRACT:

An opportunistic nosocomial pathogen *Acinetobacter baumannii* is known to be commonly found in soil, water, and skin. These gram-negative aerobic bacteria are rapidly developing resistance to antimicrobial agents. For this, WHO has listed them as one of the most significant ESKAPE pathogens under the “Priority 1: CRITICAL” list. In a developing country such as Bangladesh, Carbapenem-Resistant *A. baumannii* (CRAB) seems to be very difficult to control as it easily restrains antimicrobial treatment. The existence of CRAB and the hazards to public health regarding this bacterium were demonstrated in this investigation. This retrospective study entails cases throughout this observational research, including risk factors, complications, diagnosis, and outcomes of *A. baumannii* infections in Bangladesh. Antibiogram was performed to measure and determine antimicrobial resistance. From hospitals affiliated with medical schools, specimens were collected and standard techniques were used to identify *A. baumannii*. A trend of the spread of antimicrobial resistance was seen across the *A. baumannii* infections in the specimens studied. A correlation was established after analyzing previous cases and case studies. Patients who are critically ill under intensive care units and burn units are prone to this

bacterium where it can conveniently pervade through the body. Besides, it has also been linked to nosocomial pneumonia, meningitis, skin and soft tissue infections, and urinary tract infections among patients other than ICU units. To reduce the spread of this HAI-linked *A. baumannii* infection, several preventative measures were suggested.

Keywords: AMR, Carbapenem-Resistant, *A. baumannii*, Bangladesh

RGVAHS-2022-PP4

Prevalence and drug resistance pattern of *Escherichia coli O157:H7* from raw cow milk in Dhaka city, Bangladesh

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ABSTRACT:

Milk and dairy products are consumed daily by people all over the world, and they include essential nutrients such as proteins, lipids, minerals, and vitamins. *Escherichia coli O157:H7* is a pathogenic bacterium that can cause foodborne disease. The study's objective was to isolate, identify, and assess the antibiotic susceptibility of *Escherichia coli O157:H7* in raw milk. Fresh milk samples were collected in sterile containers. The sample was streaked onto selective medium Eosin Methylene Blue (EMB) Agar plates to get pure *E. coli* colonies. For *E. coli O157:H7*, a well-isolated colony was picked and sub-cultured onto Sorbitol MacConkey agar and EC MUG broth. For confirmation of antimicrobial susceptibility, biochemical profiling was performed. 38% were found to be positive for *E. coli* whereas 12% were confirmed as *E. coli* O157: H7 positive using the *Escherichia coli* O157 latex test. Accordingly, all *E. coli* was highly susceptible to Ciprofloxacin (69%), Meropenem (100%), Imipenem (100%), and Levofloxacin (75%). Furthermore, the resistance of 75%, 65%, and 75% was developed to Cefoxitin, Amoxicillin, and Ceftazidime, respectively. A higher prevalence of *Escherichia coli O157:H7* and its drug susceptibility profile in this study are alarming for public health, and farm owners and the community should be made aware of this. To prevent serious health hazards from *E. coli O157:H7*, it is critical to develop strong hygiene standards while dealing with raw milk or other milk products.

Keywords: *E. coli O157:H7*, Milk, Antimicrobial susceptibility

RGVAHS-2022-PP5

Antibacterial activity of three Algerian plants essential oils against Carbapenem-resistant *Acinetobacter baumanii*

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ABSTRACT:

Folk medicine uses wild and medicinal herbs in the treatment of many diseases. In this study, we investigate the antibacterial activity of the essential oils of three Algerian plants; *Achillea compacta*, *Laurus nobilis,* and *Mentha piperita* against carbapenem-resistant *A. baumanii* strains. Three chemically analyzed essential oils by gas chromatography-mass spectrometry were evaluated for their antimicrobial activity against clinical and environmental strains of *A. baumanii* using two methods, disk diffusion, and broth micro dilution. Studied essential oils showed good activity in *A. baumanii* eradication with interesting minimal inhibitory concentration values which don't exceed 0,25%, 0,063%, and 0,026% for *Achillea compacta, Laurus nobilis,* and *Mentha piperita,* respectively. The findings of this study indicate that essential oils extracted from those plants can be used as a natural antibacterial agent with potential pharmacological applications.

Keywords: *Achilleacompacta, Laurus nobilis, Mentha piperita, Acinetobacter baumanii,* Antibacterial activity

RGVAHS-2022-PP6

Micro Irrigation - A new innovation of climate change mitigation

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ABSTRACT:

Climate change is having a major impact on the availability of water resources for agricultural production in India. Water is a key factor in rising agricultural production. Approximately 90 percent of India's water resources are used for agriculture, out of which only

50 percent are used by plants, and the remaining water resources are wasted as deep percolation and evaporation. Therefore, primary attention needs to be given to the effective use of water supplied for irrigation purposes to improve the efficiency of water delivery. Recognizing the rapid decline in irrigation water capacity and increasing water demand from different sectors, several demand management approaches have been put in place to save water and improve the current productivity of water use in Indian agriculture. One such method recently implemented in Indian agriculture is micro irrigation, which involves both the irrigation system of drip and sprinkler. With this in mind, the research work was carried out field experiment was conducted at TNAU – Coimbatore, to find out the suitable crop establishment methods and irrigation methods on B.N. hybrid grass. It is an interspecific cross between bajra or pearl millet (*Pennisetum glaucum*) and napier grass (*Pennisetum purpureum*). The experiment was laid out in a strip plot design comprised of irrigation and crop establishment methods with three replication. Subsurface drip irrigation significantly increased green fodder yield (335.0 t/ha/year), water-saving (23.3 %), water use efficiency (23.74 t/ha/mm), water productivity (0.024 t/m^3), and economic water productivity (474.78 ₹ /ha/mm). Among crop establishment methods, significantly higher green fodder yield (331.5 t/ha/year), water use efficiency (21.47 t/ha/mm), water productivity (0.021 t/m^3), and economic water productivity (408.49 ₹ /ha/mm) were noted with horizontal planting of setts with sett treatment. Hence, subsurface drip irrigation and horizontal planting of single budded setts with sett treatment should be adopted to obtain higher green fodder yield, water saving, water use efficiency, water productivity, and economic water productivity of *bajra napier* hybrid grass [CO (BN) 5].

Keywords: Climate change, Micro irrigation, B. N. Hybrid grass, Water use efficiency

RGVAHS-2022-PP7

Potential impacts of liquid waste of Dakhni, oil field on the surrounding environment and their phytobial remediation

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ABSTRACT:

The environment is contaminated due to oil and gas fields. The study is aimed to analyze the impact of wastewater discharge from the OGDCL Dakhni oil field on the water, soil, plants, and animals of the surrounding environment, to remediate the liquid waste of the OGDCL Dakhni oil field by using bacterial and plant resources. Liquid waste can be used for various purposes, including underground injection to increase oil production, irrigation, livestock watering, and various other industrial uses. The soil contaminated with liquid waste accumulate an enormous amount of heavy metals that could restrict their use as they enter the food chain through biomagnification and can induce toxicity to the ecosystem. Composite soil samples, plant samples, water samples, blood samples, and milk samples were collected from a waste water tank, water tank under treatment, and from the surrounding area of OGDCL Dakhni Attock, Punjab respectively. Heavy metal concentrations i.e. Chromium (Cr), Copper (Cu), Cobalt (Co), Nickel (Ni), and lead (Pd) were analyzed by using atomic absorption spectrophotometer. The results were compared with reference samples of the study area. It was found that samples (water, soil, plant) collected from wastewater pound; pound under treatment and the surrounding area of the pound was high in concentration of heavy metals as compared to the heavy metals. It was concluded that bioremediation and Phyto-bioremediation efficiently reduce the concentration of heavy metals in contaminated water and soil due to OGDCL Dakhni wastewater. After remediation, we can remediate the wastewater and contaminated soil.

Keywords: Oil and Gas Development Company Limited, Heavy metal, Bioremediation, Phytoremediation

RGVAHS-2022-PP8

Pharmacological justification of Folkloric Claims of *Rumex vesicarius* Linn. in cardiovascular disorders in Pakistan

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ABSTRACT:

Rumex vesicarius (L.) is a traditional folkloric medicinal herb of Asia used to treat cardiovascular disorders. The present investigation was methodically planned to investigate the

pharmacological foundations for the therapeutic effectiveness of *R. vesicarius* in cardiovascular illnesses, as well as the underlying mechanism. Ex-vivo vaso-relaxant effects of crude leaf extract of *R. vesicarius* were observed in rabbit aorta ring preparations, and hypotensive effects were measured using pressure and force transducers connected to the Power Lab Data Acquisition System. Furthermore, *R. vesicarius* displayed cardioprotective properties in rabbits when they were exposed to adrenaline-induced myocardial infarction. In comparison to the intoxicated group, the myocardial infarction model showed decreased levels of troponin, CK-MB, LDH, ALT, ALP, AST, and CRP, as well as necrosis, apoptosis, oedema, and inflammatory cell enrollment. *R. vesicarius* has revealed good antioxidant properties, prolonged the noradrenaline intoxicated platelet adhesion, and showed partially endothelium-dependent and calcium channels blocking vasorelaxant and hypotensive effect. HPLC analysis showed the presence of well recognized cardioprotective phytochemicals; rutin, quercetin, vitaxin, and ascorbic acid. *R. vesicarius* showed good antioxidant, anticoagulant, vasorelaxant, and cardioprotective effects in both in-vivo and ex-vivo investigations, justifying its therapeutic utility in cardiovascular disorders.

Keywords: *Rumex vesicarius*, Myocardial infarction, Anticoagulant, Troponin, Adrenaline

RGVAHS-2022-PP9

Negative impact of global warming on wildlife: A Food for thought

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ABSTRACT:

Human-induced global warming is emerging as the greatest threat to wildlife causing negative impacts like climate change, loss of habitat in high altitude ecosystems, increased storm activities, and marine ecosystem due to rise in sea level. From the last 150 years, 20-30 % of species of plants and animals seem to be at risk and become extinct from the world. Industrial

activities have raised atmospheric carbon dioxide levels from 280ppm to 400ppm in. Humans have a 95 % contribution to the production of greenhouse gases and related effects. The challenges due to global warming are associated with climate change negatively affecting the physical and biological elements of nature. Climate change increases the extinction risk of endangered species by affecting viability, limited geographic range, and lack of natural resources leading to disturbed ecosystems. To address the threat of global warming, many species alter their behavior and geographical distribution to respond to adverse weather patterns associated with human-induced climate change. To overcome this problem there is an urgent need to take steps for transition in global environmental sustainability that may help secure the ongoing global prosperity. Undesired consequences for future generations may be there if still no attention is paid to these emerging and significant issues like poor quality water to drink, disrupted natural eco-systems, and heavily polluted air to breathe. The act of appreciation and understanding the role of strong interplay and bonding among all contributors of the environment for sustainability. There is a need to devise workable strategies that help tackle the concern of wildlife conservation and environmental sustainability as a whole.

Key Words: Wildlife, Climate change, Global warming, Endangered species

RGVAHS-2022-PP10

Use of GPS and GIS for monitoring of cattle's grazing on pasture of (*Pirassununga*)

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ABSTRACT:

Cattle behavior and grazing distribution is highly variable and can be related to the available feed resources. However, the animal behavior and responses can be influenced by the canopy shade, ambient temperature and access to water points. The objective of this study was to evaluate the interaction among tree cover (TC) and cattle positions (CP) when searching for food

and comfort, under warm and hot weather, in a pasture to understand the animal dynamics. Analyses were conducted on Faculty Of Animal Sciences And Food Engineering, Pirassununga, Sao Paulo, Brazil (lat. 4° 45' 25.9" N; 74° 52' 20.8" W) from July 2015 to January 2016. The climate of the region as per CWA (Köppen & Geiger, 1928) has an average annual temperature of 23℃ and mean annual rainfall of 1,298 mm.year-1. In December to February 2015, the av. Min. Temp. was 20 to 33℃ while in May and Sept., from 12 to 25℃. The pasture area was 34.7 ha. Tree canopy was determined with digital orthophotos QuickBird using ArcGIS® 9.1. The experimental area (9.42 ha) was divided into 06 experimental units (1.57 ha each), further divided in 05 paddocks of 0.315 ha grid cell lattice and all sapling canopies within grid cells and animal movement were mapped. Eight grazing cycles of 35 days each, with 07 days of occupation and 28 days of rest, totaling 280 days were monitored. Six cows (3 Nelore cattle and 3 Holstein) equipped with GPS-collars (Garmin eTrex-Vista) configured to record and store position, were tracked for 60 days at 5-min intervals. Average values indicate that cows travelled greater distances in warmer period (7.4 km) and 6.1 km in the hot period. Cows prefer areas with low TC (< 20%) and intermediate TC (20-40%); these areas had more biomass of fodder dry matter.

Keywords: GPS, GIS, Grazing pasture, Pirassununga

RGVAHS-2022-PP11

Impact of climate change and other risk factors association in the dispersal of Arbovirus infections in Pakistan

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ABSTRACT:

Globally, arboviruses are public health problems. Pakistan has seen a fast-paced increase in mosquito-borne Flavivirus diseases such as dengue because of deforestation, climate change,

urbanization, globalization, travel and trade factors, poor sanitation, and natural disasters. The magnitude and distribution of these diseases are poorly understood due to the lack of a competitive nationwide surveillance system. There is a strong association between climate change and mosquito-borne diseases. As the ideal temperature (26-29 °C) is reached, vector activities increase, which leads to more disease dispersal. Pakistan also faces heavy monsoon rainfall every year that leaves water pools and puddles, which ultimately become the breeding grounds for mosquitoes. Overcrowding, inadequate drinking water, poor sanitation, and increased exposure to mosquitoes caused dengue and other infections. In 2010-2011, the average temperature of Pakistan was higher than that in the last 3 decades, and the largest number of dengue cases was recorded all over the country. West Nile cases and Chikungunya outbreaks were reported in Karachi in 2015 and 2016, respectively. Important factors included the warm and humid environment of the city along with poor sanitary conditions. Recently, hospital-based surveillance has indicated the presence of the Japanese encephalitis virus, which is eye-opening for developing countries such as Pakistan. To improve the health care system in Pakistan, we should promote the One-Health approach by inviting all concerned professionals, such as physicians, veterinarians, environmentalists, concerned authorities, and educated civilians, to play a vital role in preventing the epidemic of viral diseases by assessing and mitigating the risk factors.

Keywords: Arboviruses, Public health, Climate change, One-Health

RGVAHS-2022-PP12

Anti-coagulant and thrombolytic activities of Mangiferin isolated from aqueous-methanolic leaf extract of *Mangifera indica*

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ABSTRACT:

Mangifera indica is widely used in phytomedicine for the treatment of thromboembolic disorders of cardiovascular and neuromuscular origins. HPLC analysis showed the presence of

mangiferin, quercetin, and isoquercetin in aqueous-methanolic leaf extract of *Mangifera indica*. In this study, the thrombolytic and anticoagulant (*in-vitro* and *in-vivo*) activities, as well as phytochemical screening and high-performance liquid chromatography (HPLC) of aqueous-methanolic leaf extract of *M. indica* have been investigated. For the *in-vitro* experiment, *M. indica* displayed a noteworthy ($p<0.05$) increment in prothrombin time, clotting time, and activated partial thromboplastin time in a dose-dependent manner (20%, 10%, and 5% dilutions) while heparin (250 IU/mg) being taken as a positive control. While *in-vivo* experiment noteworthy ($p<0.000$) increase in clotting time, bleeding time, activated partial thromboplastin time, and prothrombin time in a dose-dependent manner (25, 50, and 100 mg/kg) in rabbits after one week of treatment while heparin (50 units/mg) being taken as a positive control. For the *in-vitro* experiment, aqueous-methanolic extract in a dose-dependent manner (20%, 10%, and 5% dilutions) displayed noteworthy ($p<0.05$) clot lysis while streptokinase (30000 IU) was being taken as a positive control. Thus, anticoagulant and thrombolytic properties of mangiferin isolated from *M. indica* based on down-regulation of the factor Xa as well as act on antithrombin, and thrombin respectively, in the coagulation cascade.

Keywords: *Mangifera indica*, Anticoagulant, Thrombolytic, Prothrombin time, Activated partial thromboplastin time

RGVAHS-2022-PP13

Methyltrophic yeast expressed Hybrid Peptide CATH-2TP5 as a prophylactic measure toward endotoxin and inflammation

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ABSTRACT:

CATH-2TP5 is a linear cationic hybrid peptide, consequent from naturally occurring antimicrobial peptide (AMPs) Cathelicidin-2 (CATH-2) and Immunomodulatory peptide Thymopentin (TP5) having dynamic and potent anti-inflammatory activities without hemolytic effect. The biocompatible mechanism of CATH-2TP5 is favored to explore new methodologies in the direction of biomedical applications. In this retrospectively study, an antiendotoxin and

anti-inflammatory hybrid peptide CATH-2TP5 was emulated into pPICZα-A and successfully expressed in *Pichia pastoris* (*P. pastoris*). The recombinant CATH-2TP5 was purified through the Ni-affinity column and reversed-phase HPLC. The purified CATH-2TP5 peptide exhibited robust anti-endotoxin activity and significantly ($p < 0.05$) neutralized the effect of lipopolysaccharide (LPS). Furthermore, the down-regulated effect of CATH-2TP was more pronounced ($p < 0.05$) on LPS-induced cytotoxic effects, nitric oxide secretion, and pro-inflammatory cytokines (TNF-α, IL-6, and IL-1β) in murine RAW264.7 macrophages. As associated to control and parental peptide the number of apoptotic cells was also contracted with the treatment of CATH-2TP5. Thus, we concluded that CATH-2TP5 peptide may be used in various biomedical applications as a therapeutic drug.

Keywords: CATH-2, Peptides, Expression, Yeast

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Diversity and relative abundance of braconid larval parasitoid (Hymenoptera: *Braconidae*) of selected agro-ecosystems of District Sialkot

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ABSTRACT:

To control the pest population and to protect environmental integrity, biological control is a sustainable pest management technique. Hymenopteran parasitoids, braconids, are the most important group utilized as a biological control agent against insect pests. The present study aimed to determine the diversity and relative abundance of braconid larval parasitoids of selected agro-ecosystems of district Sialkot. Ten species of braconids were identified from which, *Areotetes carinuliferus, Cotesia sesamiae,* and *Cotesia glomerata* were more abundant species which exhibited 28.7 5%, 13.33%, and 10.83% abundance respectively. *Doryctobracon crawfordi, Bracon virgatus,* and *Microcrasis lonchaeae* were comparatively less abundant species with 4.58% 5.41%, and 5.42% relative abundance, respectively. A monthly abundance of braconids was higher in February (42.5%) while, lower in May (7.89%). Species richness was high in April (2.13) and low in May (1.80) however, species evenness was high in the month of April. Significant p values were observed in February Vs March, March Vs May, and April Vs

May. Berseem crop exhibited the highest relative abundance of braconids followed by brassica and wheat crop. Pair of three abundant species of braconids *A.carinuliferus, C.sesamiae*, and *C.glomerata* were placed in boxes and provided with abundant lepidopteran host species *Spodoptera exigua, Spodoptera litura,* and *Pieris brassicae* to determine their host-parasitoid relation and oviposition behavior. Only *C. sesamiae* was found to parasitize *S. exigua* host species. These sorts of studies are helpful for the biological control of harmful pest species.

Keywords: Biodiversity, Braconids, Parasitoids, Agro-ecosystem, Sialkot

RGVAHS-2022-SA02

Clean and green environment: A fundamental right for the good health of living organisms

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ABSTRACT:

The study aims to identify environmental pollution impacts on the health and growth performance of different tree species growing in polluted areas and their effective role as pollution sink. The main objective is to assess the impacts of environmental pollution on the health of living organisms. As 21st century is known as the century of science and technology. It is having beneficial aspects on one hand for living organisms but on the other hand, it is also creating such conditions which are not supporting the life of organisms. A clean environment is fundamental to our survival and well-being. Most people ignore the importance of a natural environment which is free of pollution. The presence of pollution in the environment can adversely affect people's health. The poor environmental quality is adversely affecting the natural environment and also has negative ecological and economic impacts. Living creatures must live in a healthy environment to lead a healthy life. This situation further increases the importance of the natural environment. Environmental pollution is the number of pollutants present in all components of the environment such as air, soil, and water reach the amount that

affects the living organisms negatively. Environmental pollution has become a threat to all living organisms and the environment, especially with the industrial revolution. In addition to industrial activities, increasing urbanization has led to an increase in the number of pollutants released into the atmosphere. Environmental pollution has many natural and anthropogenic sources such as industry, heating, motor vehicle use. Besides, meteorological conditions such as temperature, humidity, and precipitation can be observed. One of the important factors is also known as temperature reversal. As the result of an increase in temperature with an elevation, the pollutant particles on the earth do not distribute and create unhealthy conditions in the region. Nitrogen dioxide, the primary source of motor vehicles, is an indicator of the importance of vehicle emissions. The main source of sulfur dioxide (SO_2) is a gas produced by the combustion of industrial fuels and fuels used for heating purposes. Especially during the winter months, the values increase due to heating. With the increasing population and developing technology, efforts to reduce Environmental pollution have started to increase. Tree plantation is one of the successful ways to alleviate environmental pollution issues in an urban area. In recent advances, there is an urgent need to develop clean & green spaces around and within polluted areas for the survival of a better environment. Plants are called the lungs of the universe, without which life is not possible on the surface of the earth even for a single living organism. If haphazard human population growth and production of new pollution-causing sources go on increasing without realizing the importance of trees then probably there will be more destructive changes for living organisms on the surface of the earth in near future. So, "green revolution (Plantation) is the best solution to arrest the pollution" in changing climate of the world.

Keywords: Green environment, Good health, Pollution, Climate change

RGVAHS-2022-SA03

Anthelmintic response of *Zingiber officinale* reduced Zinc Oxide Nanostructures

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ABSTRACT:

Helminths infestations are one of the most serious health and management concerns in animals. Additionally, pathogenic helminths put rural people at risk, especially in underdeveloped nations. Helminthiasis is significant not just for the detrimental effects of parasites; other challenges such as the emergence of anthelmintic resistance have become increasingly prominent over time. The present study examined the anthelmintic activity of phytochemically reduced Zinc Oxide Nanostructures in the presence of CAE of *Z. officinale*. X-ray Diffraction, Fourier-Transform Infrared Spectroscopy, X-ray Photoelectron Spectroscopy, UV–visible spectroscopy, scanning electron microscopy, transmission electron microscopy, and energy-dispersive X-ray spectroscopy analysis was used to characterize the fabricated nanoparticles. UV–vis and XRD analysis indicated that the produced nanoparticles absorbed strongly at 365 nm and had a size distribution of 28.45–42 nm for *Z. officinale*. In contrast, to extract, parasitic mobility and mortality at various periods were noticed. Following in vitro treatment of worms to the nanoparticles, the findings indicated that doped nanoparticles substantially reduced worm mobility and increased death rate ($p<0.05$). The extraordinary anthelmintic activity of all fabricated doped ZnO-NPs suggests that they might be used as possible substitutes against resistant helminths of veterinary interest.

Keywords: Helminths, Phytochemically, Nanoparticles, Antimicrobial activity; Metal oxide, *Z. officinale*

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Anthelmintic efficacy of *Piper nigrum* against *Haemonchus placei*

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ABSTRACT:

The anthelmintic activity of *Piper nigrum* leaves was studied to determine its anthelmintic potential and to vindicate its traditional use in ethnoveterinary medicine by *in-vitro* and *in-vivo* studies. The *In-vitro* anthelmintic efficacy of crude aqueous extracts (CAE) of *Piper nigrum* leaves was studied upon adult *Haemonchus placei* collected directly of abomasum of Cattle. The *In-vitro* anthelmintic efficacy was obvious from mortality/ paralysis of worms at 3 hours post exposure to crude aqueous extracts (CAE) of *Piper nigrum* at various concentrations of 20 mg/ml and 40 mg/ml which proved statistically significant ($p<0.05$). For *in-vivo* anthelmintic efficacy of *Piper nigrum* leaves crude aqueous extracts (CAE) and crude ethanolic extracts (CME) were given orally at increasing dose rates of 1.0 and 3.0 gm/kg to cattle infected with Gastro-intestinal (GIT) nematodes, especially for *Haemonchus placei.* The maximum reduction showed by Crude Methanolic extract (CME) at the dose rate of 3.0 gm/kg body weight was 62.5 and 68.1 %, respectively at 10 and 20 days post-treatment ($p<0.05$). The positive control treated with Levamisole HCl showed the maximum reduction of 96.45 % in eggs per gram (EPG). The results demonstrated the potential use of *Piper nigrum* as anthelmintic in ethnoveterinary medicinal practices.

Keywords: *Piper nigrum,* Methanolic, GIT, EPG, Anthelmintic

RGVAHS-2022-SA05

Genes encoding laminated layer, anti-apoptotic protein and fibroblast growth factor (FBG) Receptor of hydatid cyst as potential sites for RNAi drugs against *Echinococcosis*

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ABSTRACT:

Echinococcosis is a neglected zoonotic parasitic disease in the world, prevalent in those areas where people are surviving on agriculture practices. The global infection rate is reported to be 1.2 million per annum and the fatality rate is 2.2% annually. Infection results in economic and social thrash regarding production loss, treatment cost, and mortality of animals harboring the hydatid cyst. Canids serve as the definitive host while there is a wide intermediate host range including bovines. Risk factors include exposure to cystic *echinococcus* eggs, animal farming with shepherd dogs, the density of dogs and livestock. The mature cyst of *Echinococcus granulosus* and *Echinococcus multilocularis* comprises of outer laminated and inner germinal layer and an important bio-protective character is being played by the outer layer that prevents the mimicking of the proliferation of T cells and ultimately, decreases the affinity of antibody (IgG). Parasitic metabolites like Em492 exert an immunosuppressive role and enhance the chances of parasite survival within the cyst. Intra-cystic molecular signaling inhibits the action of apoptotic protein primarily formed by the host to eliminate it. Possession of fibroblast growth factor receptor, activated by human acidic and basic fibroblast factors, supports the survival of *Echinococcus* stem cells and metacestodes. Further immune evasion mechanisms in parasites must be evaluated at the molecular level. An early detection test should be developed to identify parasites early and accurately. The therapeutic efficacy of the current anticestodals drugs is not promising due to their poor bioavailability and are unable to penetrate through the laminated layer of a cyst. Further genomic studies should be undertaken to design RNAi drugs using biotechnological tools that specifically suppress genes responsible for the formation of the laminated layer, an anti-apoptotic protein, and FBG receptor of hydatid cyst and compromise its immune evasion mechanisms, thereby inactivating the stem cells as well as metacestodes of *Echinococcus*.

Keywords: *Echinococcus granulosus*, *Echinococcus multilocularis*, Zoonotic, Apoptotic protein, FBG receptor

RGVAHS-2022-SA06

Spatial variations in intertidal invertebrate species diversity in rocky shores in Antofagasta town (23° S, Chile) and interpretation using Integrated Coastal Zone Management (ICZM)

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ABSTRACT:

The intertidal invertebrate community on the rocky shore in northern Chile is characterized by its high species richness due mainly to the high productivity of this ecosystem. The present study aims to do the first characterization of invertebrate communities in rocky shore in Antofagasta town and surrounding (23°S), using species co-occurrence and niche sharing null models, ANOSIM and NMDS. The null model results revealed that species associations are not structured, and the existing species do not have the same ecological, that would be due to many repeated species by site, and the existence of specificity in their ecological niches. The ANOSIM and NMDS revealed the absence of significant differences in sites with human intervention and without human intervention. The exposed results agree with literature for northern and central Chilean and southern Peruvian rocky shores and other coastal marine ecosystems with high productivity.

Keywords: Rocky shores, Intertidal invertebrates, Antofagasta, community ecology, Null models.

RGVAHS-2022-SA07

Effect of climate change on infectious diseases

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ABSTRACT:

Climate change, a global challenge, due to insufficient political thrust, needs a proper action plan to execute and mitigate this issue. Climate change has not only affected the human population but also the trend of infectious and non-infectious diseases. In the onset of infectious diseases, climate change is the major factor, it impacts directly or indirectly in their frequent occurrence. Events of extreme weather, fluctuating patterns of temperature, and precipitation strongly disturb the pattern of disease by increasing its frequency and magnitude. The infectious diseases which are sensitive to climate change, changing climate incriminate a shift in topographical and sequential distribution, seasonality, and transmission intensity. Susceptibility to the deadly effects of climate change is not only interplay of environmental factors but also the anthropogenic activities, socioeconomic factors with the social disparity being the major element of vulnerability. The trend of infectious diseases like Malaria and Dengue has changed due to temperature changes. Developing countries like Pakistan are suffering more from infectious diseases, the mosquito population has become more resistant to fluctuating temperature, can bear extreme Summer to extreme Winter. The global climate crisis is affecting excessively the globe and the financial capability to adopt this global issue is also inadequate and unevenly distributed. The morbidity and mortality from infectious diseases induced by climate change are likely to rise in the future in a very adverse scenario. The coming era will be crucial for all the climate change activists to develop and implement suitable mitigation and adaptation strategies.

RGVAHS-2022-SA08

Pathogenicity of mycoproteins of *Beauveria bassiana* and *Metarhizium anisopliae* to *Bactrocera zonata*

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ABSTRACT:

Delicious mango from Pakistan contributes 5% in global export. During the year 2020-21, Pakistan's export income reached 104 million $ with an increase of 33%. *Bactrocera zonata* (Saunders) proved an important pest with serious threats to the mango industry. Despite farmers' continued efforts for *B. zonata* management, the severe infestation has been recorded. It is not only delimiting the export potential but harms the country's economy. In past, the use of entomopathogenic fungi like *Beauveria bassiana* and *Metarhizium anisopliae* and their pathogenic effects on *B. zonata* has been well studied. The virulence of these potential isolates of *B. bassiana* and *M. anisopliae* is largely associated with the release of secondary metabolites, toxins, and proteins. The current study revealed the potential release of mycoproteins of *B. bassiana* and *M. anisopliae* and their lethal effects on *B. zonata*. After inoculation and precipitation of crude proteins in 95% $(NH_4)_2SO_4$ at 25 ℃, the crude samples were subjected to SDS-PAGE. The gel electrophoresis analysis revealed the presence of low molecular weight bands of 11kDa and 25kDa proteins from *B. bassiana* and *M. anisopliae* respectively. The pathogenicity of mycoproteins from *B. bassiana* and *M. anisopliae* was evaluated when second instar larvae, 4day old pupae, and 3day old adults were subjected to protein concentrations. The larval bioassays revealed that significant maximum mortality of 73.3±3.3 and 86.6±3.3 was recorded at an interval of 7 days when fed @ 10µl/g of *Bb* and *Ma* proteins respectively. Low adult emergence of 33.3±4 and 37.5±5.3 was observed when 3day old pupae were treated with proteins @ 30µl of *Bb* and *Ma* at an interval of 10 days. Low mortality of 38.0±3.7 and 48.0±5.8 was recorded when 3-day old adults (♂ and ♀) were exposed to 30 µl protein from *Bb* and *Ma* at an interval of 3 days respectively. The findings of the study conclude the production of proteins and their pathogenic effects. However, the purification process, their persistence concerning environmental regimes, and their evaluation under the field condition further are needed to be investigated.

Keywords: *B. zonata*, *B. bassiana*, *M. anisopliae*, Crude proteins, SDS-PAGE, Pathogenicity

RGVAHS-2022-SA09

Forecasting the cropland production and climate change land suitability assessment by using GIS and machine learning

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ABSTRACT:

Pakistan's agriculture sector contributes 24 percent of the economic development of the country's gross domestic product. The growth in precision agriculture is increasing in the agriculture sector—the agriculture sector is facing many challenging issues nowadays due to climate change. Due to climate change, food and water security are at risk. The farmers' primary challenge is the suitable identifying land for crop production. Managing water with convenient land crop growing seasons under climate change is a significant challenge that framers face for crop production. Usage of precision agriculture in the geo-positioning systems and computer-based software tools helps farmers to manage their land more effectively and efficiently. The GIS applications scientifically analyze the land production data. The GIS application plays an essential role in precision agriculture; it enables farmers to increase crop production. The GIS application analysis is a straightforward solution for farmers' problems. The Geographical information system applications help farmers reduce cost, time, and effort. The primary purpose of my work is to provide comprehensive knowledge and prior usage of GIS applications in agriculture and enhance that knowledge by adopting suitable methods for further analysis. For proper research, it is more important to understand farmers' issues and knowledge awareness about many parameters like lands, crop choices, climate change, water management, water security. The survey will conduct to analyze the farmer's agriculture needs. The detailed survey will provide detailed information about climate, crop, water, growing season of crop water consumption, soil characteristics, consumption of water in many growing seasons, rain falling in the growing season, soil moisture under climate change. The information will collect by using the survey in the form of raw data. The Global Positioning System (GPS) will be randomly sampled and implemented in many agricultural areas of Pakistan. The GIS system helps draw fields maps and reports of crop growing conditions. The system provides a timely alert to the farmers of the availability of deficiencies in the field. Further analysis will perform on raw and imaginary spatial data by using prediction methods. The machine learning model will apply for analysis of future prediction. The prediction results analysis will provide information to the farmers on whether the land is suitable for crop production or not.

Keywords: Forecasting, Crop land production, GIS, Climate change, Machine learning

RGVAHS-2022-SA10

Potential of *Glycyrrhiza glabra* (Licorice) extract as alternative therapeutic agent against Poultry Coccidiosis

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ABSTRACT:

To control coccidiosis, anticoccidials are generally used as feed additives. Though, the frequent usage has given rise to the occurrence of resistant strains to available anticoccidial drugs. Botanicals may work as a substitute for anticoccidial drugs. The current research was designed to evaluate the efficacy of aqueous methanol extracts of *Glycyrrhiza glabra* (roots) as anticoccidial in different concentrations i.e. (100, 200, and 300 mg/kg of body weight). For *In vivo* trial 105-day old broiler birds were grouped in seven equal units (A, B, C, D, E, F, and G). At the age of one week, groups A, B, and C were orally treated with three doses (100, 200, and 300 mg/kg of body weight). Group D was medicated with Vitamin E and Group E worked as infected medicated control group (Baycox® treated), Group F served as infected non medicated control group (PBS treated, -ve control) and Group G was designated as normal control group non-infected and non-medicated (+ve control) group. At the age of the 14th day, all unit groups were infected orally with 60,000 sporulated oocysts of different *Eimeria* species. Though comparable with reference drug (Baycox), *Glycyrrhiza glabra* showed good anticoccidial efficacy against the following parameters. i.e., feed conversion ratio, lesion score, fecal score, and oocyst score. Results of serum profile showed no adversative effects of aqueous methanol extract of *Glycyrrhiza glabra*on in the trial broiler birds.

Keywords: *Glycyrrhiza glabra* extract, *Eimeria*, Coccidiosis

RGVAHS-2022-SA11

Forecasting crop disease detection and environmental monitoring by using remote sensing and machine learning

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ABSTRACT:

Crop disease in the agriculture sector is a significant worry for many countries, as food demand is rapidly increasing due to population growth. Crop diseases cause a considerable loss of valuable food crops every year worldwide. Due to environmental change factors, water and food security become a major threat, which is more severe. Emerging countries such as Pakistan have faced a loss in crop productivity in the past few years. One of the main reasons behind the failure of crop production is that crops face many harmful diseases. The other factor that caused less crop production that the farmer's unawareness of crop disease. Most farmers in Pakistan are unaware of the early stage of crop disease. The remote sensing application plays a vital role in precision agriculture. The remote sensing applications scientifically analyze the environmental data. The usage of satellite and drone technology development rapidly increases. The satellite technology helps to collect real-time data from the environment and crops. My work aims to analyze environmental factors like water resources, air characteristics, and cropland characteristics to identify significant factors that impact crop disease. Remote sensing technology like drone technology is mainly used to collect disease-related data. Ground metrology stations and aerial metrology stations will be deployed in many agricultural areas of Pakistan. The Ground metrological station provides the image-related data. The aerial metrological station provides air-related spatial data like air temperature, humidity other air-related characteristics. Aerial and Ground measurements are taken in a real-time environment. The data information provides a timely alert to the farmers that crops face disease deficiency in the field. The real-time data is in the form of raw data. The aerial and Ground station connect with a mobile device using GPRS 3G or 4G networks. The data will store in a server-side database. Further analysis will perform on data by using the machine learning method. In this work, I will compare the predictive power of many sets of variables. The results provide information on significant

environmental factors that impact crop disease. The prediction classification methods provide information like in future the crop disease level is minor impact crop or more impact on crop production. The purpose of this work is to assist farmers in lowering production costs and achieving higher yields, provide crop disease-related significant information to the farmers, and benefit the country's economy.

Keywords: Forecasting, Crop disease, Remote sensing, Machine learning

RGVAHS-2022-SA12

New fossil remains of *Choerolophodon* (Proboscidea) from Litra Formation of Suleman Range, Sakhisarwar, District, D. G. Khan, Pakistan

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ABSTRACT:

The mammalian fossil fauna is discovered from the fossil site named Gurbun, which belongs to Litra Formation, Lower Siwaliks of Sakhisarwar, D. G. Khan, Punjab, Pakistan. The fossils from the Suleman range (situated in Sakhisarwar) have been poorly documented, as it is an area with little human intervention and has been provided with an abundant amount of mammalian fossil fauna of the Late Miocene age. The retrieved material belongs to the family, Choerolophodontidae (*Choerolophodon corrugations*). All fossils discovered during on-foot transects were recorded in specified stratigraphic intervals. The specimens were gathered consisting of isolated dentitions including tusk fragments, deciduous premolar, maxillary, and mandibular molar teeth of *C. corrugates.* The species of genus *Choerolophodon* was differentiated from others mainly because of tusk structure. The specimens were observed, identified, and compared with previous data. Based on Paleoenvironmental data, the synecological characteristics of discovered fossils from the Litra Formation suggest the presence of a large open land environment with variable dry and flood seasons, extensive rain forests, and better-vegetated protection, similar to Eurasia and Africa.

Keywords: Fossil, Choerolophodontidae, Suleman range, Dera Ghazi Khan

RGVAHS-2022-SA13

Scope of GIS (Geographic Information System) and remote sensing in agriculture

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ABSTRACT:

Geographic Information System (GIS) makes use of visual depictions of data and presents spatial analyses to make informed decisions about crops, animals, and diseases. In agriculture, more advanced spatial analyses may evaluate variables such as soil type, wind direction, rainfall amount, slope, aspect, terrain, or elevation to aid in crop management, site suitability, and drainage planning, as well as risk prevention from flood, drought, erosion, and disease. GIS is a vital role-player in automated field operations, also known as precision agriculture. GIS can assist a farmer in adapting to various circumstances, monitoring the health of particular crops, estimating yields from a specific field, and boosting crop production. Farmers have enhanced their decision-making capabilities for planning their farming operations to maximize yields by using data collected from remote sensors as well as sensors installed on farm machinery. Tracing digital tags of animals by remote sensing through the use of drones, aircraft, and satellites can help to collect data and predict animal health conditions including susceptible pathogen attack and disease probability. The use of remote sensing technology aids large-scale modern dairy establishments to trace cows near to or on heat, nutrient deficiency in animals, and sick animals.

Keywords: GIS, Remote sensing, Agriculture, Disease

RGVAHS-2022-SA14

Role of remote sensing in determining food security status

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ABSTRACT:

The food industry is in a state of change of technology driven by the need for new interference and wireless networking to improve the process of automation and result in an increase in productivity. The application of technology in the sector of Food and Agriculture is enormous. Artificial intelligence, networking, and machinery significantly range from farming, monitoring, yield mapping, cultivation, storage, food processing to the end consumer. Pakistan is facing great challenges in providing adequate food and ensuring food security. Information on crop acreage, structural and spatial distribution in a timely and comprehensive way and is, therefore, an important prerequisite for government to make decisions at multiple levels to mitigate food insecurity risks. Assessing food security information on food affordability, local food market price, nutritional outcomes, is now easy with the use of information provided by remote sensing. Global Agriculture Geo-Monitoring Initiative (GEOGLAM) is in demand to monitor the amount of food grown worldwide. GEOGLAM accords and coordinates production assessment across regions and nations using satellite data to ensure transparent, comprehensive monitoring and evaluation of food availability for international markets. Integration of economic food security indicators from the satellite will become important to clinch food security. Remote sensing is proved to be efficient data acquisition technology and is widely applied in the agriculture and food sector to monitor crop distribution and future food prediction under different scenarios.

Keywords: Food security, Remote sensing

RGVAHS-2022-SA15

Effect of Nebivolol on the cardiorespiratory parameters against exercise-induced stress in female physiotherapy students in Multan

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ABSTRACT:

This study was started after approval from the ethical committee of Muhammad institute of Medical and Allied Sciences, Multan, Pakistan. A study was conducted from July to November 2021. The present study aims to assess the potential of the drug nebivolol for the

treatment of cardiorespiratory parameters (Blood pressure, heart rate, oxygen saturation, temperature, and respiration rate) against exercise-induced stress and its related complications. 20 individuals who met the inclusion criteria were selected by using the PAR-Q and allocated into two groups i-e treatment group-A and control group B. The sample size was calculated by the Yamane formula. The individuals were monitored by using Pulse oximetry (Choice M Med), Mercurial sphygmomanometer apparatus (CERTEZA), and stethoscope (ATOM medical) before and after stress exercises. Group-A was given Nebivolol (5mg), after 1.5 hours they performed stress exercises (step test 20 steps in 1 min, shuttle run test 20meter). In Group-B, no drug was given before stress exercises (step test 20 steps. In 1 min, shuttle run test 20meter). After activity in both groups, parameters were calculated. After monitoring of parameters, it seemed that those who took Nebivolol before the exercise (group-A) had normal parameters even after stress exercises as compared to those individuals who did not take Nebivolol before stress exercises (group-B). Statistical analysis showed that the result obtained after treatment of Group-A was more significant i-e (p 0.01) than Group-B treated population i-e (p 0.04). In our study, the treatments protocols were found effective to treat blood pressure, pulse rate, oxygen level, and respiration rate, with nebivolol.

Keywords: Blood pressure, Oxygen saturation, Respiration rate, temperature, nebivolol

RGVAHS-2022-SA16

Hormonal and mineral profile during synchronization with CIDR in postpartum Nili Ravi buffaloes

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ABSTRACT:

The study was conducted to evaluate the efficacy of a controlled internal drug-releasing device (CIDR) and to assess levels of hormone i.e. Progesterone and minerals i.e. Calcium, Phosphorus during synchronization in postpartum anestrous Nili-Ravi buffaloes

during the low breeding season. For this purpose, a total of twenty buffaloes were divided into two groups each with 10 animals in each group. For the treatment group, CIDR was inserted intra-vaginal for 14 days and an injection of 2ml Dalmazine (150 µg d-cloprostenol) per animal was administered intramuscularly on day 13. After CIDR removal, animals were observed for estrus and subsequently inseminated 12 and 24 hours after standing heat. Pregnancy was assessed at day 60 post insemination. In both groups, blood sampling was done at days 0, 7, 9, 11, 14, and 21 posts artificial insemination (AI) for analysis of Progesterone, calcium, and phosphorus, and the difference was calculated between treatment and control group. Further, their difference was evaluated between pregnant and non-pregnant buffaloes. The progesterone concentration was measured through ELISA while levels of calcium and phosphorus were measured through spectrophotometry. The estrus intensity, ovulation rate, and pregnancy rate were significant ($P<0.05$) higher in group A buffaloes. It was concluded that CIDR can be used efficiently for the induction of estrus during the low breeding season in buffaloes.

Keywords: Postpartum Anestrous buffaloes, Estrus Synchronization Protocol CIDR, Progesterone, Calcium, Phosphorus

RGVAHS-2022-SA17

Comparative analysis of Topical Glucosamine Sulfate and Proprioceptive exercises on pain and functional disability in knee osteoarthritis

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ABSTRACT:

Glucosamine sulfate produced through plant extracts, Palmyrah (*Borassus flabellifer* L.*)*. A single-blinded randomized clinical trial (IRCT20220115053712N1) was conducted to assess the potential of proprioceptive exercises and glucosamine sulfate (C6H15NO9S) cream for the treatment of knee osteoarthritis (grade 1, 2, and 3) and its related complications. The patients were assessed by radiological findings and physical assessment. Then they were followed for 6-weeks to check for a recurrence of symptoms. Thirty patients were enrolled who met the

inclusion criteria and were randomly segregated into two groups (15 each). Group-A was treated with proprioceptive exercises i.e., standing on 1 leg, knee flexion, knee extension exercises, walking on the heels, walking on toes, half-squat, side lunge, one-legged balance exercises, while group-B was treated with glucosamine sulfate cream. The exercise regimen was distributed over 6-weeks, 3 times per week. The exercise sessions lasted for 30 minutes. Glucosamine sulfate was applied topically twice daily, 3 times per week for 6-weeks. The dose of glucosamine sulfate cream was 250 mg twice daily. The patients were evaluated before and after treatment regarding pain and functional activities by using NPRS and WOMAC scales. Statistical analysis showed that results obtained after treatment of Group-A were more significant ($p<0.000$) than Group-B treated populations ($p<0.009$). In our study, both the treatments protocols were found effective to treat osteoarthritis grades 1, 2, and 3. But proprioceptive exercises were more significant and effectively alleviated pain and functional disability.

Keywords: Osteoarthritis, Proprioceptive exercises, Topical glucosamine sulfate

RGVAHS-2022-SA18

Formulation of Polyherbal gel and evaluation of anti-nociceptive and anti-inflammatory activities in sports-related injuries

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ABSTRACT:

Objective: To evaluate the anti-nociceptive and anti-inflammatory activities of a polyherbal gel consisting of extracts of *Cinnamomum verum, Curcuma longa, Zingiber officinale, Syzgium aromaticum, Trachyspermum ammi, Linum usitatissimum, Sesamum indicum,* and *Mentha piperita*. Methods: Anti-nociceptive and anti-inflammatory activities were performed in sports-related injuries. Participants were divided into two groups of nine people in each group. The first group received topical application of polyherbal painkiller gel and the second group received topical application of diclofenac sodium gel. In this method, the anti-inflammatory and anti-nociceptive effects of the treated groups were evaluated based on the numeric pain rating scale (NPRS). Results: The polyherbal painkiller gel produced significant

anti-inflammatory and anti-nociceptive activities in sports-related injuries (P<0.01) in comparison with diclofenac sodium gel. Conclusion: The present study demonstrated that the polyherbal formulation of painkiller gel consisting of *Cinnamomum verum, Curcuma longa, Zingiber officinale, Syzgium aromaticum, Trachyspermum ammi, Linum usitatisimum, Sesamum indicum,* and *Mentha piperita* has significant anti-inflammatory and anti-nociceptive activities might be due to the constituents present in these ingredients.

Keywords: Polyherbal gel, Anti-nociceptive, Anti-inflammatory, Sports injuries

RGVAHS-2022-SA19

Evaluation of antibacterial activity of leaves extract of *Myrtus communis* and formulating herbal ointment for various skin infections and comparing its activity with the commercially available leading brand- Furacin

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ABSTRACT:

A study was designed in which the antibacterial activity of a plant *Myrtus communis* belonging to the *Myrtaceae* family was assessed. For this purpose leaves of the plants were selected. The dried leaves of the plant were purchased from the local market of Islamabad. They were then further processed i-e ground in a coffee blender and macerated for 7 days and then extracted. Two solvents were used for extraction. One was Ethanol and the other was n-hexane. The extracts were obtained in the semi-solid green residual form. The extracts obtained in both solvents were evaluated against two bacterial strains. One was gram-positive bacteria i-e *S. aureus* and the other was gram-negative bacteria i-e *P. aeruginosa.* The ointment was prepared afterward, by using both extracts and three different formulations were formulated i-e one with ethanolic extract, one with n-hexanic extract and the third one was formulated with a combination of both ethanolic and n-hexanic extracts. Pharmaceutical parameters like physical evaluation, homogeneity, measurement of pH, uniformity of weight, viscosity, spread ability, and irritancy were determined. The prepared formulations were also assessed for microbial contamination and physical stability. All formulations were evaluated for color, consistency, and phase separation, and all formulations were found smooth

and homogeneous and no clumps or aggregations were found. pH was determined initially as well as on storage. It was found that the pH was in the range of 5.6–6.9 for all ointment formulations that complied with the pH range for the skin. Initially, FO3 showed a minimum pH value whereas FO1 showed a maximum pH value. Uniformity of weight for the average results of 10 individual readings was found to meet the release limit for the assay. The results indicate that all formulations had optimal viscosity and were insignificantly different from each other, where FO2 found least viscous and FO3 found most viscous formulation at 25°C. The values of the spread ability indicated that all three formulations required relatively less shear force to spread at the site of application. FO3 showed the minimum value and FO1 showed the maximum value for readability. All formulations passed the checking for microbes as no growth pieces of evidence were seen on either plate. No formulation was found irritant when studied on albino rats. All formulations were found stable at 25°C, 30°C, and 40°C.

Keywords: Antibacterial activity, Herbal ointment, Phyto extract

RGVAHS-2022-SA20

Impact of changing climate on the interaction between plant and pest: A Review

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ABSTRACT:

Climate change, a growing worldwide problem, has far-reaching implications for agriculture. Climate change is altering the quality and quantity of agricultural commodities and impacting insect pests. Changes in different climatic factors like temperature, humidity, precipitation, and other meteorological components lead to disturbance in the natural cycles of living organisms like insect pests directly and indirectly. Changes in climatic patterns can affect insect pests in many ways. The direct impact of climate lead towards the increased survival rate during overwintering and their distribution over the area. Moreover, it can also cause the increased risk of biological control agents' ineffectiveness, migratory pest invasion and can also cause a rise in plant diseases caused by pests. On the other hand, indirectly climate changes affect their relationship to the environment, natural enemies, competitors, and mutualists. Insects'

body temperature depends on the environmental temperature, change in the temperature leads towards affecting the insect development, behavior, reproduction, and distribution. The effect of climate change on different phytophagous globally important insects was assessed under different climatic conditions like temperature, humidity, precipitation. The rate of damage increased in 41% of insects. Whereas, reduced damage was recorded in 4% and 55% of insect pests showed a mixed response. Among other factors, habitat losses due to climate change are also a major threat to insects' population decline. So, it is concluded that any climate change ultimately leads to a disturbance in insect behavior and risk of crop losses and food security.

Keywords: Climate change, Global warming, Insect pest, Agriculture, Food security

RGVAHS-2022-SA21

Effect of Herbicides application on maize crop productivity

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ABSTRACT:

Weed infestation is the main problem in maize (*Zea mays* L.) productivity. An experiment was performed to compare the efficacy of different herbicides for weed control in maize. There were 10 treatments viz; T_1 = Weedy check, T_2 = Weed-free till harvest, T_3 = Weed-free till 6 weeks, T_4 = Pendimethalin 825 g a.i. ha^{-1}, T_5 =S-Metolachlor 1920 g a.i. ha^{-1}, T_6 =Mesotrione. 10 g a.i ha^{-1} + Acetochlor 85 g a.i. ha^{-1}+ Atrazine 50 g a.i. ha^{-1}, T_7 = Mesotrione 75 g a.i. ha^{-1} + Atrazine 750 g a.i. ha^{-1}, T_8=Thiencarbazone-methyl 30 g a.i. ha^{-1} + Isoxaflutole 74 g a.i. ha^{-1} + Cyprosulfamide 50 g a.i. ha^{-1} (Safener), T_9=Paraquat Dichloride 500 g a.i. ha^{-1}, T_{10}=N-phosphonomethyl glycine 1200 g a.i. ha^{-1}. An experiment was laid out in Randomized Complete Block Design (RCBD) with three replications at the research area of MNS-University of Agriculture, Multan in August 2021. Data regarding weeds (density and weed control efficiency) and crops (plant height, cob length, cob diameter, 1000-grain weight, grain yield, etc.) were collected and analyzed. The results revealed that a maximum weed control efficiency and grain yield was obtained in T_2. Moreover, a significant weed control efficiency, 1000-grain weight, and grain yield were recorded in T_8 and T_6 when compared to all other treatments.

It was concluded that keeping the maize crop weed-free till the harvest (T_2) is the best practice to control weeds and achieve maximum productivity. Among the herbicides, Mesotrione a.i. 10 g ha^{-1} + Acetochlor a.i. 85 g ha^{-1}+ Atrazine a.i. 50 g ha^{-1}(T_6) and Thiencarbazone-methyl a.i. 30 g ha^{-1} + Isoxaflutole a.i. 74 g ha^{-1} + Cyprosulfamide a.i. 50 g ha^{-1} (Safener), (T_8) performed better in controlling the maize weeds.

Keywords: Herbicides, Maize productivity, Weed control, Efficacy

RGVAHS-2022-SA22

Calcium Sulphate seed priming shows calcium toxicity in Rhodes grass seedlings at higher concentrations

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ABSTRACT:

Ca (Ca) plays important biochemical functions and supports many metabolic processes in plants. It is regarded as an important mineral that contributes to the proper development of plants. Plant research has focused on the nutritional improvement of cereals, but there is also potential to improve the nutritional quality of forage crops through different agronomic techniques. This lab experiment was conducted to improve the calcium content in Rhodes grass (*Chloris gayana*) seedlings through calcium seed priming. In this experiment, Rhodes grass seeds were primed with calcium sulphate ($CaSO_4$) at 0%, (T1) 0.5% (T2), 1.0% (T3), 1.5% (T4) and 2.0% (T5) solutions for 12 hours. Germination indices and seedling growth attributes were evaluated for up to 3 weeks. The experiment was conducted under CRD and was replicated four times. $CaSO_4$ at 0.5% solution (T2) showed improvement in germination percentage (89%), seedling emergence percentage (84.2%), root fresh weight (9.9 mg), shoot fresh weight (38.0 mg), root dry weight (4.3 mg), and shoot dry weight (6.5 mg) but the results were

statistically at par with the control treatment (T1). However, germination index (6.3), seedling vigour index (4901.4), radicle length (16.1 mm), and shoot length (43.7 mm) were significantly improved in T2. A negative trend in all parameters was recorded when Rhodes grass seeds were primed with $CaSO_4$ at 1.0%, 1.5%, and 2.0%. It is concluded that calcium seed priming has a non-significant effect on the cumulative response of germination indices and seedling growth attributes in Rhodes grass. However, it has improved some individual parameters at 0.5% $CaSO_4$ concentration, but above this concentration, a negative effect was observed showing the possible toxic behavior of calcium at higher levels.

Keywords: Calcium sulphate, Rhodes grass, Seed priming, Toxicity

RGVAHS-2022-SA23

Effect of calcium sulphate seed coating on germination and seedling growth attributes in Rhodes grass

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ABSTRACT:

Calcium plays a fundamental role in plant development and productivity. It is a structural component of cell walls and membranes and also acts as an intracellular secondary messenger. Considering its important role in early plant development, a lab experiment was conducted to evaluate the effect of calcium seed coating on germination indices and seedling growth attributes in Rhodes grass (*Chloris gayana* Kunth). In this experiment, seeds of Rhodes grass were coated with calcium sulfate ($CaSO_4$) at 0 (T1), 0.25 g kg^{-1} (T2), 0.50 g kg^{-1} (T3), 0.75 g kg^{-1} (T4), and 1.0 g kg^{-1} seed (T5). Germination indices and seedling growth attributes were evaluated for up to 3 weeks. The experiment was conducted under CRD and was replicated four times. $CaSO_4$ at 0.50 g kg^{-1} (T3) showed improvement in germination percentage (92%), seedling emergence

percentage (88.2%), root fresh weight (11.9 mg), shoot fresh weight (41.0 mg), root dry weight (3.8 mg), and shoot dry weight (6.5 mg). However, germination index (6.8), seedling vigour index (5206.5), radicle length (15.3 mm), and shoot length (43.7 mm) were significantly non-significant in all the treatments. So, it is concluded from this experiment that seed coating with calcium sulfate improves germination and seedling growth when applied at 0.75 g kg^{-1} seed in Rhodes grass.

Keywords: Calcium, Rhodes grass, Seed coating, Germination indices, Seedling attributes

RGVAHS-2022-SA24

The research progress of the applications of herbal feed additives in poultry production

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ABSTRACT:

In recent years, with the health problems caused by poultry food being particularly prominent, people pay more and more attention to the safety of poultry feed additives. Herbal medicine is a green, safe, edible dual-purpose feed additive, used in poultry farming, prevent and control Avian Influenza disease, Promote animal growth and improve feed utilization. At the same time, it improves the performance of poultry and the quality of products such as meat, eggs, and milk. To provide people with healthy, green, and safe food products. This paper will explain the main research progress and future research directions of the mechanism of Chinese herbal medicine, its advantages, and applications in poultry feed with a view to the benefit of this research field.

Keywords: Poultry, Herbal medicine, Feed additives, Poultry production

RGVAHS-2022-SA25

Impact of climate change on wheat production in Potohar region of Punjab, Pakistan

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ABSTRACT:

Climate change has a varying effect on different crops and as such wheat is not an exception. For this reason, the impact of climate change is debated in economic literature as it appears to harm farm revenue in one factor while positive in some other factors. This study employs Ricardian analysis to ascertain the impact of climate change on wheat production through the change in net return from wheat crops as a result of elevated temperature and changing precipitation in the Potohar region of Punjab, Pakistan. For this purpose, a sample size of 160 wheat growers was purposively selected from eight widely scattered villages in district Jhelum and Chakwal (*four villages each*). Ordinary Least Square regression analysis was run for the relative effect of variables. The results of the study reveal that net return from wheat per acre was Rs. 16,928/- and Rs. 11,494/- in Jhelum and Chakwal, respectively. Application of fertilizers, pesticides, and irrigation/water flow were the main contributing factors to wheat production and resulting net return from it. The effect of temperature on wheat yield was positive up to an optimal level of 21.8^{o}C in Jhelum and 24.1^{o}C in Chakwal and negative beyond the optimal limit, whereas, hydrological extremes (uneven precipitation) were observed to harm wheat yield and subsequent net income. Amongst various adaptive measures to climate change, utilization of drought-resistant seeds and improved irrigation systems are recommended for enhancing net return from wheat crops.

Keywords: Climate change, Wheat production Net-return, Ricardian model

RGVAHS-2022-SA26

Impact of climate change on infectious and non-infectious diseases

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ABSTRACT:

Changes in one or more climatic variables such as temperature, precipitation, humidity, wind, and sunlight are examples of anthropogenic climate change. It causes a major burden on infectious diseases as well as non-infectious diseases. Earth's surface temperature rises as a result of human-caused climate change so the frequency and severity of extreme heat waves, droughts, storms, hurricanes, tornadoes, fires, drought, tsunamis, and floods are also increasing day by day. These alterations may influence the survival, reproduction, and dispersion of disease pathogens and hosts, as well as the availability and mode of transmission. The effects of global climate change on human infectious illnesses may be studied by looking at the three disease components: pathogen, host, and transmission environment. Infectious illnesses such as dengue fever, malaria, hantavirus, cholera, salmonellosis, and giardiasis may see higher epidemics as a result of rising temperatures and floods. Non-infectious illnesses, on the other hand, are caused by factors such as heredity, malnutrition, the environment, and lifestyle. Non-infectious diseases such as cardiovascular disease, some malignancies, mental problems, Alzheimer's disease, epilepsy, stress, anxiety, and malnutrition are more prevalent due to climate change. These infectious and non-infectious diseases increase due to greater competition for finite natural resources. Humans play an essential and active role in this process; via adaptation strategies, as they may lessen the impact of climate change. Crucial observation of the relationship between climate change and infectious illnesses, effective deployment of technology, resources to promote healthy lifestyles, and public awareness are all critical adaptation strategies to help combat these infectious and non-infectious diseases.

Keywords: Impact of climate change, Infectious, Non-infectious, Diseases

RGVAHS-2022-SA27

Applications of GIS and RS tools for ticks and tick-borne disease occurrence

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ABSTRACT:

Ticks are hematophagous arthropods that constitute a serious threat to human and animal health because of their role as a vector for the spread of many tick-borne diseases (TBDs). Tick dynamics are complex environmental problems caused by biotic (such as pathogens, vegetation, wild animals, domestic animals, and humans) and abiotic factors (such as humidity, evapotranspiration, temperature, landscape). Statistical models that predict the infection risk mapping and disease prediction may be useful for the effective prevention and control measures to reduce the transmission of TBDs incidence in the future or to address public health risks. Geographic information systems (GIS) and remote sensing (RS) provide a detailed understanding of the interactions between these factors in three ways: by (a) mapping small- and large-scale ranges of tick species, (b) examining the spatial expansion of emerging TBDs and active disease survival (b) obtaining information regarding a large-scale of temporal-spatial variations of ground environmental factors such as humidity, temperature and the land cover type, which may influence tick-occupied habitat.

Keywords: Ticks, Tick-borne diseases, GIS, RS

RGVAHS-2022-SA28

Antimicrobial activity of *Dacryodes edulis* against food spoilage microbes

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ABSTRACT:

Globally, food spoilage caused by microorganisms widely affects various types of food and causes food waste and loss, even in developed countries. Food spoilage has an impact on food security for poor people, food quality and safety, economic development, and the environment. Bacteria, yeast, fungi are the common types of microorganisms responsible for the

spoilage of a vast majority of food and food products. Although synthetic preservatives have been used in preventing spoilage caused by microorganisms, these preservatives sometimes cause harm to human health. Hence, natural sources of preservatives are being considered. This study was carried out to evaluate the antimicrobial effect of extracts from *Dacryodes edulis* group of plants. 10 grams of *Dacryodes edulis* was weighed and soaked in 100 ml of distilled water each for 72 hours, while for the methanol extract, 10 grams of the plant was weighed and soaked in 100 ml of methanol for 72 hours. After three days, the plant was extracted using the muslin cloth and centrifuged. The phytochemical screening was carried out to check for the active components present in the plant extract. The isolation of the organisms from the spoilt meat and chicken was done; thereafter it was subcultured severally in other to obtain a pure culture. The identified organisms were *Citrobacter freundii*, *Salmonells enterica*, *Proteus Vulgaris*, *Trycophyton*, and *Cladosporium.* These organisms were then subjected to the antimicrobial activity of varying concentrations of the methanol and aqueous extract using the agar well diffusion method. The diameter in millimeters of the inhibition zones was measured. The data obtained were analyzed using ANOVA. The screening of the extracts of *Dacryodes edulis* indicated the presence of phenol, alkaloid, glycoside, steroid, quinon, terpenoid, anthraquinone, and flavonoid. The results showed antibacterial and antifungal activity of both methanol and aqueous extract of *D. edulis.* The diameter of the zones of inhibition was concentration-dependent in both extracts. As the concentration increased, the diameters increased and vice versa. The extract of *D. edulis* showed antimicrobial activity and thus has a good potential in combatting food spoilage microorganisms, thus, aiding the preservation of food.

Keywords: Antimicrobial activity, *Dacryodes edulis*, Food spoilage microbes

RGVAHS-2022-SA29

UAV-Based remote sensing in crops stress imagine using high-resolution thermal sensor for digital agricultural practices

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ABSTRACT:

Water management is becoming a big issue for sustainable agriculture, especially in a semi-arid region where water scarcity is enhancing day by day. The most accurate water status recovery in crops is required for precise irrigation through remote sensing technologies. These remote sensing technologies have a lot of potential in intelligent irrigation because they allow for real-time environmental data collection. Nowadays, digital practices have been used such as unmanned aerial vehicle which plays a key role in various application related to crop management. Drones offer an exciting opportunity to track crop fields with high spatial and temporal resolution remote sensing to enhance water stress management in irrigation. Unmanned Aerial Vehicle (UAV) has received considerable scholarly attention in recent years, thanks to its high mobility fields, low cast, and flexible development in various civil and military fields, such as package delivery, precision agriculture, and aid communication. Remote sensing technologies help modify agricultural practices to meet this significant challenges by providing repeated information on crop standard at various scale and different performance during the season. Thermal imaging can identify water status variations and crop water stress index (CWSI). This CWSI acquired through UAV thermal sensors imagery can be acceptable for managing real-time irrigation to achieve optimum crop water efficiency. This poster will be discussed how can increase optimum crop water efficiency by using remote technologies.

Keywords: Unmanned Aerial Vehicle (UAV), Crop Water Stress Index (CWSI), Optimum crop water efficiency, High-Resolution thermal sensor

RGVAHS-2022-SA30

Prevalence and risk factors associated with Cryptosporidium infection in young animals in Khushab Punjab, Pakistan

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ABSTRACT:

A total of 685 fecal samples (415 buffalo calves, 184 cattle calves, 93 kids, 42 lambs, and 35 camel calves) from different private livestock farms and homebred animals from four tehsils (Khushab, Noorpur Thal, Nowshera, and Quaidabad) of district Khushab, Punjab, Pakistan were collected and examined by modified Ziehl–Neelsen staining technique to determine the prevalence of Cryptosporidium spp. and its association with age, sex, season and fecal consistency in domesticated animals. Overall, 22.10% of the animals were positive for Cryptosporidium infection with a prevalence of 20.24, 26.6, 19.3, 21.4, and 28.5% in buffalo calves, cattle calves, kids, lambs, and camel calves, respectively. The prevalence of infection was significantly higher ($p < 0.05$) in camel and cattle calves below 30 days of age (33.3 and 31.57 % in camel and cattle, respectively) than animals between 31 and 90 days (21.42 and 21.34 % in camel and cattle calves). But in kids, it was higher in the age group of 31 to 90 days (20.06 %) than in younger animals (19.04 %). Statistically, a non-significant higher prevalence of Cryptosporidium spp. was recorded in females than males. Seasons had a significant effect ($p < 0.05$) on the prevalence of infection; the prevalence was highest in summer (sheep 40%, cattle 37.7%, and camel 36.4%) and lowest in autumn and winter season. A high degree of association was recorded between Cryptosporidium infection and diarrhea in cattle and camels screened during the present study. The prevalence was higher in diarrhoeic than in non-diarrhoeic ruminants. Moreover, in the case of sheep and goats, only diarrhoeic samples were found positive.

Keywords: Prevalence، Cryptosporidium، diarrhea، Punjab

RGVAHS-2022-SA31

Machine vision approaches to efficiently manage smart farming

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ABSTRACT:

Machine vision for precision agriculture has attracted considerable research interest in recent years. This paper aims to provide information towards the application of machine vision to agriculture, mainly for crop farming. This study can serve as a research guide for the researcher and practitioner alike in applying cognitive technology to agriculture. In this study, we have paid attention to the classification of three different types of Land used / Land covers such as fertile land, high saline land, and medium saline land. For the classification of the saline area, we have used eight different data mining classifiers that are Function (Multilayer Perceptron-L), Lazy (KStar), Function (Logistic), Lazy (IB1), Lazy (IBK), Meta (Random Committee), Meta (Decorate), Meta (Rotation Forest) has been applied on texture dataset to gain the required accuracy result for classification. The results showed that Function (Multilayer Perceptron-L) provides the 90.33% accuracy, Function (Logistic) 92.44 % accuracy, Lazy (IB1) 93.79% accuracy, Lazy (IBK) 94% accuracy, Function (Logistic) 94.77% accuracy, Lazy (KStar) 94.2%, Meta (Decorate) 95% accuracy, Meta (Random Committee) 95.424% accuracy, Meta (Decorate) 96.0784% accuracy and Meta (Rotation Forest) provides the our considerable better 96.333% accuracy. Thus results showed that Meta (Rotation Forest) classifier gave a better result as compared to the other 7 classifiers. Finally, it has been examined that as dataset feature values have been increased, the accuracy results will be increased and obtain better results for the classification of FL, MSL, and HSL. It is observed that a classifier can be used for decision making, quick and accurate analysis, and future prediction for classification.

Keywords: Machine vision, Precision agriculture, Classifiers, Intelligent systems, Smart farming

RGVAHS-2022-SA32

Genetic markers for identification of dairy cattle

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ABSTRACT:

Recently, advances in molecular genetic markers have raised significant opportunities for enhancing genetic improvement in dairy animals. Commonly used genetic markers are the DNA-based markers; RFLPs and minisatellites, and PCR-based markers like microsatellites, SNP, etc.

They are more direct molecular markers that survey DNA variation itself rather than rely on variations in the electrophoresis mobility of the protein that the DNA encodes. Such techniques enable dairy animals to acquire desired milk production characteristics. These genetic marker approaches are promising tools for milk production improvement in dairy animals. The present study represents a review of various genetic markers in versatile aspects that will prove beneficial for researchers and scientists to undertake further research to improve dairy animals.

Keywords: RFLPs, Minisatellites, Microsatellites, SNPs

RGVAHS-2022-SA33

Effects of massage therapy with aerobic exercises on level of glucose, blood pressure, and diabetic peripheral neuropathy

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ABSTRACT:

This study was started after approval from ethical committee of Muhammad institute of Medical and Allied Sciences, Multan, Pakistan. Study conducted from July to December 2021. The present study aims to assess the effects of massage therapy with aerobic exercises on level of glucose, blood pressure and on diabetic peripheral neuropathy. 46 individuals who met the inclusion criteria were selected by using the questionnaire and allocated into two group's i-e treatment group-A and control group-B. The individuals were monitor by using Mercurial sphygmomanometer apparatus (CERTEZA), stethoscope (ATOM medical) and glucometer before and after single treatment session .Neuropathy were assessed by using pin-prick testing and neuropathy pain scale. Group A receive massage therapy with aerobic exercises (Walking and cycling) lasted 30 minute session two days per week for six weeks. Aerobic exercise includes 6 minute walking on electronic treadmill with moderate intensity and 4 minute cycling on stationary bicycle. In group B perform only traditional balance training (Stable to unstable base of support, Bipedal to semi tandem, tandem to one leg stance). Parameters were calculated after single treatment session in both groups. After monitoring of parameters treatment group (Group-A) shows that blood pressure, glucose level decreases. Sensations also improve in

treatment group. While in control group (Group-B) only balance is improved. Statistical analysis showed that result obtained after treatment of Group-A was more significant i-e (p0.01) than Group-B treated population i-e (p0.04). In our study the treatments protocol were found effective to treat diabetes mellitus type2, hypertension and peripheral neuropathy with massage therapy and aerobic exercises (Walking and cycling).But in control group only balance is improved which is checked by functional reach test.

Keywords: Diabetes mellitus, Hypertension, Peripheral neuropathy

RGVAHS-2022-SA34

Influence of the aqueous extract of *Cichorium intybus* (Chicory) as alternative antibiotic growth promoter on growth performance, lipid and mineral profiles of broilers

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ABSTRACT:

The present study investigated the influence of *Cichorium intybus* (chicory) leaf extract on chickens. On day-old chicks (n=150) were distributed into 15 replicates (10 birds/replicate) for 35 days. These replicates were allotted to five treatment groups with each group consist of three replicates. Two experimental diets (starter and finisher) were formulated with and without antibiotic growth promoter (AGP) in the form of (Enradin) and coccidiostat (Salinomycin). Birds of positive control (PC) were offered commercial ration supplemented with AGP and coccidiostat (Salinomycin) along with water without any supplementation. Birds of negative control (NC) were fed ration without AGPs but given fresh water without any extract. Moreover, birds of acidic chicory leave extract (ACLE), neutral chicory leave extract (NCLE) and basic chicory leave extract (BCLE) were fed diets without AGPs but given water supplemented with

chicory leave aqueous extract, with 3, 7 and 12 pH, respectively. Chicory leaf extract significantly (*P<0.05*) influence the weight gain and FCR in BCLE. However, feed intake, serum minerals (Ca, P, Na and K) and mortality were found to be non-significant (*P>0.05*). Replacement of AGPs with chicory leave aqueous extract (with different pH), suggested significant performance of broilers in terms of weight gain and efficiency of feed utilization with profit margin. Overall study suggested that use of chicory extract in broiler production may be recommended as an inexpensive but efficient alternative of AGPs.

Keywords: Aqueous extract, *Cichorium intybus*, antibiotic, Broilers

RGVAHS-2022-SA35

Antibiotic growth promoter; Chicory; Growth Performance; Lipid profile; Broiler

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ABSTRACT:

Agriculture sector of Pakistan is severely affected by the consequence of climate change during the last couple of decades. In this study, the severity of different types of drought like meteorological, hydrological and agricultural drought was assessed in the Lasbela and Gwadar coastal districts of Pakistan during 1991â”€2020 period. Standardized Precipitation Index (SPI) and Standardized Precipitation Evapotranspiration Index (SPEI) indices were used for the assessment of meteorological drought, Stream flow Drought Index (SDI) index for the assessment of hydrological drought and Vegetation Condition Index (VCI), Temperature Condition Index (TCI), and Vegetation Health Index (VHI) indices for the assessment of agricultural drought. Ground based, remote sensing and Global Climate Models (GCMs) datasets were analyzed in R-programming language, DrinC and in cloud computing platform Google Earth Engine (GEE). According to results of meteorological indices at different timescale, years from 1999 to 2003 were severe dry to extremely dry and 1994 to 1996, 2010 and 2019 were observed a very wet to extremely wet. The SDI exhibited moderate drought in the hydrological years 1992, 1993, 1998, 1999, 2013, 2014, 2019, 2020, while mild drought was observed during 2002, 2003.The VCI index indicated 2001 as severe dry year while 2002, 2003, 2004, 2006,

2008 and 2018 as moderate dry years. According to the VHI analysis, the vegetation appeared to be severely affected during the drought years of 2001 and 2002, while a moderate drought was observed during the 2003-2018 period. The increase in the meteorological drought resulted in exaggerating the hydrological drought hazard, which had ultimately impacted the agriculture of the Lasbela and Gwadar districts. However, implications of anthropogenic activities like overexploitation of groundwater, increasing water use, and poor socioeconomic conditions of the communities need in-depth research for sustainable agriculture and livelihoods on a long-term basis in this region in the future.

Keywords: Severity, Drought, Remote sensing, Coastal belt, Agriculture

RGVAHS-2022-SA36

Evaluating response of mountain grazing lands to recent trends in seasonal climate in Pakistan

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ABSTRACT:

The deterioration of grazing lands as a result of environmental changes has become a serious concern in the mountainous region of Pakistan. The present study is aimed to evaluate the response of vegetation cover of grazing land to recent trends in seasonal temperature and rainfall in the Mansehra district of Khyber Pakhtunkhwa province, Pakistan. Correlation analysis was performed between the MODIS data products, i.e., NDVI (Normalized difference vegetation index) and LST (Land surface temperature), and TRMM rainfall datasets of the 2000-2018 period. NDVI indicated negative correlation with LST of winter (R= -0.56), spring (R= -0.7), summer (R= -0.24) and autumn (R= -0.23) significant ($p<0.05$) for winter and spring seasons only. In contrast, the correlation of NDVI was observed positive with seasonal rainfall exhibiting coefficient of correlation values of 0.41, 0.79, 0.64, 0.7 for winter, spring, summer, and autumn significant ($p<0.05$) for the last two seasons only. The low correlation observed between NDVI and LST of summer and autumn seasons is likely because of the prevailing stress condition of

chlorophyll contents of the vegetation cover under warming conditions. However, this situation appears to be compensated by the rainfall as indicative of the moderate to strong correlation between the NDVI and rainfall of these two seasons. The least NDVI values observed during the winter season indicate the prevalence of snow cover over higher altitudes, i.e., above 2300 m, and availability of limited vegetation cover and grazing opportunities in the lower valleys. However, an in-depth investigation of production patterns would further facilitate in analyzing the grazing potential to support decision-making for long-term grazing management. Regular monitoring of land use, plant phenology, and socioeconomic conditions should be a part of future rangeland research programs to develop effective resource conservation strategies for this Himalayan mountain region.

Keywords: Climate change, Rangeland, Remote sensing, Khyber Pakhtunkhwa, Lesser Himalayas

RGVAHS-2022-SA37

Effect of liquid and powder form Phytase in pre, post-pelleting feed on growth performance and mineral digestibility of broilers

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ABSTRACT:

The effects of post pelleting liquid phytase supplementation on growth performance, plasma, tibia phosphorus, and its utilization in broilers were evaluated. A total of 504 one-day-old broiler chickens procured randomly allocated to six dietary treatments were: B positive control (PC) diet [0.42% available P in grower feed, A negative control (NC) diet with (0.30% avail. P in the starter and 0.26 % avail. P in grower) while four diets C, D supplemented with NC+ [500 and 750 powder phytase units (FTU)/kg] and G, H supplemented with NC+ [500 and 750 liquid phytase units (FTU)/kg] respectively. The pelleting temperature was set at 85Â°C during feed processing production parameters were recorded weekly. Blood, ileal digesta, the weight of visceral organs, left tibia were sampled for the quantity of phosphorus in plasma, its digestibility, and tibial calcium and phosphorus. The present study displayed 49.45%, 64.64%, and 8.64 % higher results in feed intake, body weight gain, and feed conversion ratio respectively, in group H. High liver, heart, and gizzard weight exhibited significantly in groups A, B respectively. Tibia ash (45.11%), calcium (15.67%), and phosphorus (8.06%) in group H. It was concluded that supplementing liquid phytase, phosphorus availability, and digestibility increase the growth performance and phytate phosphorus.

Keywords: Chickens; Liquid phytase; Growth performance; Tibia ash; Plasma phosphorus

RGVAHS-2022-SA38

Climate change and increased risk of tick-borne diseases

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ABSTRACT:

Ticks are obligate hematophagous ectoparasites of domestic and wild animals, as well as people. Ticks are found all across the world, from the Arctic to the Tropics. Tick infestations persist despite attempts to eliminate them and pose a major threat to human and animal health. They are responsible for transmitting a variety of diseases including CCHF, Lyme disease, Q fever, Tick fever, Tularemia, Babesiosis, and Anaplasmosis. Ticks spent the majority of their lives outside of the host in the environment, therefore, climate change is predicted to have an

impact on them in terms of their survival rates, fecundity, and host interaction rate, phenology of mature and immature ticks as well as propagation rate of the pathogen. Climate warming is greatly influencing ticks' diversity, distribution, and the infectious agents/diseases they transmit. As the temperature is increasing in the world, the environment is becoming more suitable for ticks' growth and development and ultimately, season suitability for a tick is increasing. The presence of ticks in much warmer climates reveals that they can survive over temperature extremes and can disseminate infectious agents in their hosts. However, further studies on the impact of climate change on tick-borne pathogen dynamics and distribution are highly recommended.

Keywords: Ticks, Climate change, Global warming, Diseases

RGVAHS-2022-SA39

Detection of soil-borne zoonotic parasites from grazing areas of District Faisalabad

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ABSTRACT:

Soil is a vital medium for the existence of humans and a vast variety of organisms that reside on or inside the soil. According to an estimate, 25% of the earth species consider soil as their home having most of these organisms are harmless and may provide other services such as waste decomposition and climatic regulation. Soil-borne parasites cause great losses to livestock having zoonotic importance. Among them, the protozoan parasites are of significant importance and mainly transmitted through the fecal-oral route. So, the soil either directly or indirectly affects the large population of animals and humans throughout the world. Keeping in view the current scenario, the present study was designed to investigate the prevalence and associated risk factors of soil-borne protozoan parasites in District Faisalabad. Briefly, 200 soil samples (as determined through epidemiological sample size formula) were collected from grazing areas of District Faisalabad in polythene bags through a simple random sampling method having 50 samples from each town under this study. DNA of parasites from these samples was extracted

through a DNA extraction kit followed by PCR. The information regarding associated risk factors, which may have an impact on the transmission of these parasites, were collected on a predesigned questionnaire. The collected data were statistically analyzed through multiple logistic regression and odds ratios. Out of a total of 200 samples, 120 samples were found positive for one or more parasites showing an overall prevalence of 60%. From these samples, seven parasites were isolated including *Giardia*, *Cryptosporidium*, *Sarcocystis*, *Balantidium*, *Toxoplasma*, *Enterocytozoon*, and *Entamoeba*. The most prevalent parasite in grazing soil was *Giardia* showing an overall prevalence of 21.5%, while the least detected parasite was *Entamoeba histolytica* with an overall prevalence of 6.5%. The study concluded that transmission of these soil-borne parasites can be reduced by adopting the hygienic practices that make climatic conditions unfavorable for parasite growth.

Keywords: Soil, Zoonotic parasites, Climate, Protozoa

RGVAHS-2022-SA40

Microbial Resistance (MR) controlled by remote sensing, geographic information system, and *Lptadenia Pyrotechnics*

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ABSTRACT:

Infections caused by multidrug- resistance bacteria are an increasingly global issue due to the emergence and propagation of microbial drug resistance and the lack of development of new antimicrobial agents. Remote sensing is an emerging technology through this technology take internal data from human beings and animals in this way can easily diagnose the target disease parts and geographic information system help to provide global data about various diseases. The *L. pyrotechnical* was collected from the campus area of CUVAS, Bahawalpur, and extracts were prepared using methanol, ethanol, and water using the Soxhlet extraction method. Herein, the in vitro antibacterial and antifungal activities of the ethanolic, methanolic, and aqueous extracts of *Leptadenia pyrotechnica* plant were investigated against *Streptococcus agalactiae*, *Staphylococcus aureus*, *klebsiella pneumonia*, and *E. coli* using agar-well diffusion assay. The plant extracts effectively inhibited the growth of both the pathogenic bacterial and fungal strains.

S. aureus was found highly susceptible and inhibited by all solvent extracts. Methanolic extract of *L. pyrotechnic* showed higher inhibition of growth in all tested strains of the bacteria and fungi. This microbial activity was strongly affected by variation in solvents, and their concentrations (10 mg/mL, 5mg/mL, 2.5 mg/mL, 1.125 mg/ml, and 0.5 mg/mL). Minimum inhibitory concentration range of 0.541 (minimum) and 2.453 (maximum) was noted against various pathogenic bacterial and fungal strains. Combination use of medicinal plant base drugs, remote sensing, and GIS can be used for the treatment of various diseases and controlled microbial resistance.

Keywords: *Leptadnia pyrotechnica*, Remote sensing, Geographic information System, Pathogenic Bacterial and Fungal Strains, Microbial resistance

RGVAHS-2022-SA41

Equine Protozoal Myeloencephalitis (EPM)_A Disorder from contaminated Soil

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ABSTRACT:

Equine protozoal myeloencephalitis (EPM) is a disease, affecting the nervous system having more infection in working or racehorses due to stress and immune compromised situation. EMP is usually associated with gait abnormalities leading to lameness. It may also accompany brain diseases and worsen the situation. Sarcocystis (*S. neurona*) is the culprit protozoa causing lameness by EPM. *S. neurona* can parasitize all regions of CNS ranging from the cerebrum to the spinal cord. Horses are considered aberrant hosts due to the presence of schizonts and merozoite stages of the parasite. Horses may get an infection through contaminated soil. According to a serological survey, almost 30% of the equine population from Southern Punjab, Pakistan has been infected with EPM. The disease is progressive ranging from mild lameness to sudden recumbency. Parasite damages the gray matter of innervated limb muscles and produces weakness and atrophy. It also causes lameness in other mammals like shunks, Pacific harbor seals, cats, raccoons, mink, and ponies. Cats could be used as experimental

intermediate horses after sporocyst ingestion and harbor the Sarcocystis stage. Antimicrobial agents are not found good against EPM but even then, it is considered a treatable disease.

Keywords: Soil, Lameness, Cerebrum, Recumbency, Gray Matter

RGVAHS-2022-SA42

Climate change: An important aspect of public health concern

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ABSTRACT:

Climate change, developmental and environmental issues, is continuously increasing as a consequence of greenhouse gases (GHGs) accumulation in the environment due to intense anthropogenic activities. Climate Change exerts a negative impact not only the low-income populations but also the developed nations such as the USA, Europe, and China. The role of poor countries in the adaptation and mitigation of climate change is minute, while the developed countries putting more and more, causing global climate change. Climate change exerts adverse impact on public health e.g., extreme cold and heat-related events, increased risk of malnutrition, altered distribution vector-borne and zoonotic diseases due to changing temperature and rainfall pattern, increased frequency of droughts and floods, both scarcities, and excess of water can cause disease. Public health as a result of changing climate is suffering from respiratory (asthma, respiratory allergies, and airway diseases), cardiovascular, stroke, and food and water-borne diseases (diarrhea, dysentery, salmonellosis, giardiasis, balantidiasis, etc.). An increase in vector and vector-borne diseases (Malaria, Dengue, Lyme disease, and Leishmaniasis), mental health and neurological issues: stress, solastalgia, numbness, epilepsy, and amnesia, cancers (skin), and many social impacts like increased accidents, suicide and crime ratios. The climatic effect on public health, increasing within no time and need more interventions. Though policymaking systems; WHO, CDC (globally), NIH, IPH (national) are continuously doing efforts to lessen its effect on the public, there is a need to refresh adaptation and mitigation strategies. Early public health surveillance can save mother nature from adverse health and environmental impacts, e.g., reduce carbon footprints, cut use of fossil fuel, reduce deforestation, develop carbon capture and storage process, build resilience against climate effects (BRACE framework), and sharing of

responsibilities between the populations. A political decision regarding climate change (reduced CO_2 emission) should be made more effective for a more positive change in saving our planet.

Keywords: Climate change, Mitigation strategies, Public health

RGVAHS-2022-SA43

Echinococcosis, climate change, and remote sensing- Future perspectives to mitigate transmission

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ABSTRACT:

Echinococcosis is distributed all over the world leading to almost $2 billion annually in terms of treatment and setbacks to the livestock industry. These losses are underestimated values because of under-reporting and challenges in diagnosis. The environmental factors play a crucial role in the transmission and distribution patterns of *Echinococcus spp*. Global population expansion coupled with food insecurity and changes in land use, changing trends of average temperatures, rainfall patterns, urbanization along with deforestation, overgrazing, and grassland reduction are modifying zoonotic disease transmission. Climate change and man-led environmental factors lead to alterations in population dynamics of both animals and *Echinococcus*, Spatio-temporal overlapping of the competent hosts, and the facilitation of better conditions for the survival of *Echinococcus* eggs. Rigorous research to develop the causal relationship between environmental factors and *Echinococcosis* in humans and animals is highly recommended. Further, integration of host and environmental data within a sentinel site surveillance network is recommended that will complement satellite remote-sensing information. Last but not least, identification of the transmission risk factors of environmental origin is one of the vital tools for designing the predictive models to develop cost-effective anticipatory public health action against *Echinococcosis*.

Keywords: *Echinococcosis*, Climate change, Remote sensing

RGVAHS-2022-SA44

Use of exogenous feed pigments for egg yolk pigmentation-A new innovation tool

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ABSTRACT:

We eat with our eyes color of any food product is strongly associated with human choices. Depending upon regional preferences, the color of poultry products like egg yolk and broiler skin plays a large role in consumer acceptance of poultry products. The color of egg yolk is an important parameter for consumers and is produced by carotenoid pigments in the feed. This is also used as a tool to assess the quality of a product. The yolk color depends not only on the levels of pigmenting substances, namely, xanthophylls, present in the feed but also on the type and the ratio of these compounds. There are different sources of xanthophylls used for egg yolk pigmentation. Moreover, poultry birds cannot produce carotenoids on their own, which is why the color of egg yolks and broiler skin mainly depends upon the carotenoids content of their diets. Although, it is not only the number of carotenoids/pigments that matters but also their efficacy, bioavailability, and color intensity. Since laying hens can transport these pigments into their egg yolks from the ingested feed, pigments of either natural or synthetic origins are added to hen diets to achieve the desired egg yolk color. These carotenoids have beneficial effects on human health because of their anti and pro-oxidant activity and ability to be converted to vitamin A. Furthermore, lutein may be protective in eye disease because they absorb damaging blue light that enters the eye. These value-added tools may increase the acceptance and consumption of these eggs in our society.

Keywords: Exogenous feed pigments, Egg yolk pigmentation, Xanthophylls

RGVAHS-2022-SA45

Effect of heat stress on production performance in Poultry

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ABSTRACT:

Poultry and livestock business activities are greatly influenced by environmental and weather conditions. Bird's condition is severely affected especially during transition season and rainy seasons when the wind is quite swift. As a result, wind becomes cold so birds require more feed to maintain their body temperature. Studies showed that the temperature is higher (31-34 ℃) during the daytime while nights are a bit cold (26-3- ℃) in high temperatures, more energy is needed to regulate the body functions so there is less supply of energy for egg production. In addition, as feed consumption decreases, the nutrients in the body are reduced, which may lead to a decrease in egg production. The higher climatic temperature can make poultry birds stressed, so the energy is also utilized to overcome the stress condition. The stress usually begins to affect when the temperature reaches up to 29 ℃. humidity levels can also trigger stress because moisture also plays a key role in affecting the temperature felt by the poultry birds. Ideal temperature and humidity for poultry birds are 25-27 ℃ and 60-70% respectively. The high environmental temperature may harm the health and performance of laying birds. It also changes the behavior like consuming feed and remaining prostrated, opening wings in an attempt to reduce or dissipate the body heat. Thus to obtain the best performance of poultry birds in terms of meat and eggs, the operation of systems on animal thermal comfort zone is needed. The thermal environment affects the behavior of laying birds. It is possible to understand the thermo-neutral zone for birds and make it possible to predict animal welfare.

Keywords: Poultry, Production, Heat stress

RGVAHS-2022-SA46

Isolation of plastic degrading microorganisms from waste dump sites

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ABSTRACT:

Plastic pollution is a threat to the environment because of its slow degradation rate and high usage. The continuous accumulation of these synthetic plastic wastes poses an ever-increasing threat to animals, humans, and the environment, and the use of microorganisms to effectively degrade plastic waste can provide a solution to the problem of plastic pollution. This study aims to isolate plastic degrading microorganisms from soils. The soil samples used for this study were collected from dumpsites filled with plastic and plastic materials and the effectiveness of the degradation of plastic materials was studied over six (6) weeks in broth and agar culture under laboratory conditions by weight determination method. Physicochemical and microbiological analysis was carried out on the various soil samples using standard protocols. The biodegradation of polyvinylchloride (PVC) was done in-vitro using the microorganisms isolated from the soil. Microorganisms that we're able to degrade a higher percentage of the plastic materials were; *Staphylococcus aureus*, *Streptococcus sp*, *Bacillus sp*, *Escherichia coli*, *Aspergillus niger*, *Aspergillus flavus*, and *Trichoderma viridae*. The total viable count for bacteria and fungi were within the range of 11.8x105 to 2.0x1010 and 3.3x105 to 0.1x1011 respectively. *Staphylococcus aureus*, *Streptococcus sp*, *Bacillus sp*, *Micrococcus sp*, *Aspergillus niger*, *Aspergillus flavus*, and *Trichoderma viridae*, degraded plastic up to 25%, 31.2%, and 25% 31.2%, 12%, 10%, and 10% respectively. These isolates may be used to actively degrade plastics, thereby reducing the rate of plastic pollution in our ecosystem.

Keywords: Biodegradation, Plastic, Pollution, Polyvinyl chloride, Wastes

RGVAHS-2022-SA47

Lead heavy metal effects on human health

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ABSTRACT:

It has been documented that lead can cause a wide range of adverse health outcomes. To advise occupational health professionals of the latest research on the multi-system toxic effects of lead and the implications of this research for setting new safe and appropriate occupational suspension limits. Lead (Pb) could be a highly noxious, non-disintegrative heavy metal with a bluish-gray color, an atomic number of 82. Several mechanisms are explained for the damaging

effects on the body system. Lead poisoning could be a real threat to the general public health, especially within developing countries. Accordingly, great efforts on a part of occupational and public health are taken to curb the risks of this metal. The hematopoietic, cardiovascular, renal, reproductive, and central nervous system, bones are among the parts of the chassis and systems that are vulnerable toward the hazards following exposure to a high level of Pb. Lead is carcinogenic. The utilization of Pb-containing products like agrochemicals, oil, paint, mining, etc. can result in Pb contamination within the environment and thereby, can enter the organic phenomenon. During this review, we have discussed the huge harmful impact that leads to toxicity on humans and the undeniable fact that these harmful toxicants are often found quite easily within the environment and abundance. The use of lead should be stopped/avoided or restricted to safeguard human health.

Keywords: Pb, Lead PbB, Reactive oxygen species, O- aminolevulinic acid dehydratase, MDA, SOD

RGVAHS-2022-SA48

Monitoring of Vaccination status and virus circulation with Development of a thermostable vaccine for the control of Peste des Petites Ruminants

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ABSTRACT:

Peste des Petits Ruminants (PPR) is a highly transmissible and contagious disease in small wild and domesticated ruminants, predominantly goats and sheep. Commonly called â€˜Goat Plagueâ€™; itâ€™s caused by Peste des Petits Ruminants Virus (PPRV). The objective of this study is to draw attention to the status of PPRV and stresses upon its eradication from Pakistan. Mixing of herds, movement of animals across borders, restricting animals during rainy and winter seasons are risk factors for transmission of PPR. Wild small ruminants play a major

role in the epidemiology of PPR. This study will find out that wild animals are responsible for the spread of PPR; there is a scope of this disease in wild ungulates. Pathological lesions and clinical signs of PPR are similar to Rinder Pest disease. Diagnosis of PPRV is possible by collecting clinical samples employing several molecular and serological techniques; laboratory confirmation; post-mortem lesions; epidemiology; distinctive symptoms and general clinical observations. In Pakistan, vaccines contain Nig 75/1 strain which is being used for immunization against all PPR viruses. Post-vaccination monitoring of PPRV vaccinated areas and the development of thermostable vaccines could be the best option in controlling the disease. Tagging of animals with the advent of remote sensing and GIS tools could be beneficial in calculating and tracking animals for vaccination status. In addition, there is a dire need for investigations to explore the role of wildlife in PPR transmission.

Keywords: Peste des Petits Ruminants (PPR), Epidemiology, Vaccine, Nig 75/1, Transmission

RGVAHS-2022-SA49

GIS monitoring for Dengue mosquito

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ABSTRACT:

GIS monitoring tool can be an effective method to monitor and control effectively for the eradication of pests including mosquitoes responsible for dengue fever. The technique was used to monitor dengue outbreak in and around Multan, Muzaffargarh, and Layyah

Keywords: GIS, Dengue, Mosquito, Pest control

RGVAHS-2022-SA50

Effect of mastitis on milk composition in crossbred (Holstein Friesian A—Cholistani) and Sahiwal cattle

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ABSTRACT:

The present study was designed to investigate the effect of mastitis on various components including fat percentage, protein, total solids, solid not fat, pH, specific gravity, and lactose content in Sahiwal and cross-breed (Holstein Friesian Ã— Cholistani) cattle. A total of 376 milk samples (excluding blind and nonfunctional teats) from 100 cows (50 cross-bred and 50 Sahiwal) were collected aseptically. Animals had different ages, parity, and stage of lactation were selected under field conditions. The diagnosis of subclinical mastitis was done on basis of the Surf Field Mastitis Test. For bacterial examination of milk, the samples were grown in a laboratory and various biochemical tests were performed. The findings of the present study indicated that solid not fat (SNF) of mastitic Sahiwal and crossbred cattle was significantly reduced as the severity of mastitis increased in animals. The total solids percentage of normal and mastitic cattle including both Sahiwal and crossbred cattle was significantly reduced as the severity of mastitis increased in affected animals. The milk pH of normal and mastitic cattle including both Sahiwal and crossbred was significantly increased in severe cases of mastitis. The specific gravity of normal and mastitic milk samples as compared to normal. The protein percentage of normal and mastitic cattle including both Sahiwal and crossbred cattle indicated that protein concentration was significantly reduced in severe cases of mastitic animals. The results of the present study indicated that mastitis causes major alterations in the composition of milk leading to poor quality of the milk.

Keywords: Mastitis, Milk composition, Cross-bred, Sahiwal cattle

RGVAHS-2022-SA51

Coexisting occurrence of New Castle and Coccidiosis in pigeons in Multan

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ABSTRACT:

Pigeons (*Columba livia*) have been kept by human beings for decades due to their rousing characteristics. The most important diseases found in pigeons are Newcastle disease and coccidiosis. In Pakistan, there were limited studies on the combined effect of Newcastle disease (ND) and coccidiosis. To find out the combined effect, a survey was conducted to determine the point prevalence of Newcastle disease in pigeons. One hundred randomly selected pigeon farms were visited. From these pigeon farms, 34 sick birds were collected based on clinical signs & symptoms. Then fecal examination was performed to find out the presence of coccidial parasite by floatation technique. During the survey 9%-point prevalence of ND was found. Total 34 clinically sick birds were acquired on basis of clinical signs and symptoms from infected farms. The clinical signs & symptoms were found greenish mucoid diarrhea (100%), Torticollis (47%), Blindness (35%), shivering of the neck (23%), paralysis of wings (5%). Whereas, fecal examination of sick birds revealed no coccidial parasite. So it is concluded that there was a 9% prevalence of ND in Multan and the most repeated clinical sign showed by infected pigeons is greenish mucoid diarrhea, 2nd most occurred clinical sings is torticollis. Blindness, shivering of the neck, paralysis of wings are 3rd, 4th, and 5th respectively. Meanwhile, coexistence or mixed infection of Newcastle Disease (ND) and coccidiosis is not observed during the survey.

Keywords: Newcastle disease, Coccidiosis, Pigeon

RGVAHS-2022-SA52

GIS application in inland fisheries and ecosystem study

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ABSTRACT:

Applications of GIS and remote sensing technologies in fisheries have increased dramatically Although GIS and remote sensing have been widely applied to marine fisheries, there have been fewer applications of these technologies in inland fisheries management and planning. Like many marine fisheries GIS applications, inland fisheries applications of GIS have largely dealt with mapping the distribution and abundance of fish species, mapping and modeling habitat in rivers, reservoirs, and lakes, and relating the two. Unlike marine fisheries, which occur widely in oceans and where data on catch and the environment may be dense from landings and remote sensors, freshwater data are sparse and are much more limited in space and time. Geostatistical and distributional modeling of fishes, spatially explicit fish population modeling, predicted species distributions, and the use of remote sensing and sensor networks are some of the challenges and opportunities for freshwater fisheries managers and researchers using GIS.

Keywords: Freshwater, Fisheries, Marine, Remote sensing, Mapping

RGVAHS-2022-SA53

Impact of climate change on Agricultural insect pest

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ABSTRACT:

Pakistan is an agricultural country so; its economy is mainly based on agriculture. Global climatic changes are a great threat to agriculture and livelihood. Although the agricultural revolution increased agricultural production but with time due to global climatic changes agricultural sector faced many challenges. Climate change and global warming are contributing to a great loss of crops. Increasing temperature, CO_2 levels in the atmosphere, and changes in precipitation patterns are affecting agricultural insect pests. Insect pest species typically respond to a warmer temperature which increases their number of generations within a season. They are enhancing the population growth rate, insect-transmitted plant diseases, increased overwintering survival, increased insect pest appetite, etc. Climate change has increased pesticide use due to the presence of disease and pests which is eventually leading to cause harm to land as well as the environment. Because of these serious risks, there is a great challenge to human food security. To overcome these challenges we have to take mitigation and adaptive management strategies

such as integrated pest management (IPM) practices, monitoring of pest population dynamics, use of global information system (GIS) for invasive species, assessment of pests risks, prediction of insect infestation, etc.

Keywords: Climate change, Insect pest, Agriculture

RGVAHS-2022-SA54

Parkinson's disease

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ABSTRACT:

In this sickness notably the Parkinsonâ€™s we investigate the genetic philosophy of Parkinson's disease. Moreover, we observe genetic linkages to protein signaling pathways as potential pharmaceutical targets to treat Parkinsonâ€™s. Furthermore, we also evaluate bunches of Parkinsonâ€™s driven genes according to their single nucleotide polymorphism alterations. The difficult data mining approach supports a considerable role of chain in Parkinsonâ€™s prevalence. Pedigree's research shows that genetic components are part of etiology, rather than merely being a risk factor for Parkinsonâ€™s. The explanation of PD remains unrevealed, despite the intricate interaction between genetic and environmental components are involved. Genome-wide implication and linkage research analysis with acknowledged many genetic regions have increased for the treatment of Parkinsonâ€™s. We complete this overview with prospects and clinical implications of genetic research in Parkinsonâ€™s.

Keywords: Parkinson's illness (PD), Depression, Protein signaling pathway

RGVAHS-2022-SA55

Reasons of Poultry production that increase rates of commodities

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ABSTRACT:

The poultry sector is one of the segments of Agriculture in Pakistan. It contributes about 1.4% to the GDP of Pakistan. In the previous year, there is a trend in the rise in the prices of both eggs and broiler meat, which is unaffordable to the middle and lower classes of our society. There is a very limited study published highlighting the reasons behind this increase in prices of all poultry products. To find out the motives causing this surge in the price of poultry products, a survey was conducted. In which different stakeholders of the poultry industry were visited and investigated through a questionnaire randomly. It was found that, behind this increase in rates, there is less market supply as compared with demand. Due to this, there is an increase in price according to the laws of economics. The reason behind the less market supply was decreased production in both eggs and broiler. This decrease in production was due to two main reasons. The first one is an epidemic of two major diseases i.e. Newcastle disease (ND) and Infectious Coryza (IC). Due to these diseases production dropped up to 70%. The second reason was found that there is less import of parent and grandparent flocks of both layer and broiler due to COVID-19 epidemic, which ultimately affected negatively on production of both layer and broiler. Keeping in view the above-narrated facts found, it is suggested that there should be a proper check and balance mechanism on production, market supply, and price control in all poultry products like other agricultural commodities.

Keywords: Increase Poultry prices, Eggs, Broiler meat, Newcastle disease, Infectious Coryza

RGVAHS-2022-SA56

Prevalence of various pathogenic variants responsible for early infantile Epilepsy among Pakistani Population

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ABSTRACT:

Epilepsy is a neurological disorder that indicates abnormal activity in the central nervous system. It is caused due to genetic as well as nongenetic factors. The prevalence rate is higher in non-developed countries. In Pakistan, the prevalence of epilepsy is about 9.99/1000. Nearly 50

million people in the whole world suffer from epilepsy. Different risk factors such as head trauma, central nervous system infections, poverty, and tumors are associated with the development of epilepsy in different age groups. The objective of this study was to the range of genetic variants that can affect the risk for causing epilepsy in Pakistan. Data were analyzed through whole-exome sequencing. More than 1500 genes are involved in epilepsy. Mutations in some genes caused epilepsy and seizures. Voltage-gated sodium, as well as potassium and calcium channels, have a significant role in epilepsy. SCN1A is the major cause of epilepsy but SCN2A and SCN3A have been associated with epilepsy. Mutation in the SCN8A gene causes infantile epileptic encephalopathy and is associated with sudden unexpected death due to epilepsy. Mutation in CPA6, SLC12A5, and EFHC1 is involved in different types of epilepsy. CHRNA4 is the first epileptic gene. This is responsible for autosomal dominant nocturnal frontal lobe epilepsy. Mutation in SCN1A and protocadherin 19 (PCDH19) is associated with dravet syndrome. Mutations in KCNQ2, KCNQ3, RBFOX1, and SRPX2 are associated with rolandic epilepsy.

Keywords: Genetic Factor, Mutation, Dravet syndrome, Whole-exome sequencing, Prevalence

RGVAHS-2022-SA57

Mechanism of treating cardiovascular diseases by using different kinds of stem cells

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ABSTRACT:

Cardiovascular diseases cause worldwide death in mainly middle-income and low-income countries. There is a natural ability of different organisms in which the heart muscle shows natural regeneration in many ways. But in severe conditions, the natural mechanism cannot able to regenerate the heart muscles (cardiomyocytes) so in severe conditions, the accurate therapy of these cardiovascular diseases is only a heart transplant but this treatment is very expensive. The ongoing cell-based clinical preliminaries demonstrate that cell-based treatment likewise can treat coronary illness. These are stem cells that can separate into any other type of cells. The stem cells are present in many parts of our body like bone marrow, heart, kidneys. These are of many

types depending upon the harvesting of these cells from their sources like embryonic stem cells. In this review, it is shown which type of stem cells are used as the best source of cardiac therapy. Clinical preliminaries are done on utilizing numerous wellsprings of undifferentiated cells for cardiovascular treatment. The indigenous cardiac undifferentiated cells have been appeared to separate into various sorts of cells present in the heart including cardiovascular muscle cells also used for cardiomyocytes regeneration. So with the help of new findings, cardiovascular diseases can be prevented or treated by using stem cell therapy.

Keywords: Stem cells, Cardiomyocytes, Cardiovascular diseases, Bone marrow-derived stem cells, Adult stem cells

RGVAHS-2022-SA58

Impact of seed ball technology in the establishment of seedlings

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ABSTRACT:

Seed ball, also known as earth ball, is the combination of commodities like soil, seeds, water, fertilizers, and other optional materials for protecting the seed from harsh climatic conditions resulting in the improved establishment of a seedling. It is a cheap and sustainable way of getting good-quality pelleted seeds in rangelands and forests. Pakistan has a vast range of deserts comprising of a minute plantation. Such areas have a short spell of rainfall, low soil fertility, and water holding capacity leading to difficult germination of indigenous seeds. Seed balls can be introduced in these problematic locations through hand throwing or with aircraft. The major advantage of using seed ball technology is the establishment of seedlings under arid climatic conditions. Seeds grown through seed balls have good stand, maximum emergence under desert conditions as compared to normal seeds. It also reduces the risk of poor establishment of seed and overcomes the environmental, soil, and forest-related vegetation problems resulting in increased forestation.

Keywords: Seed Ball, Desert, Forest, Soil

RGVAHS-2022-SA59

Impact of climate change on agriculture, animal, poultry, and wildlife production

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ABSTRACT:

Currently, the world is facing several challenges, of which Global climate change is a priority area. Higher temperatures result from climate change. The effects of climate change on cow herds are expected to be both direct and indirect, according to forecasts for the future. The largest known economic impact of climate change is upon agriculture because of the size and sensitivity of the sector. Warming causes the greatest harm to agriculture in developing countries primarily because many farms in the low latitudes already endure climates that are too hot. Climate change has a significant influence on animal performance and health, particularly chickens. Heat stress affects hens, and they can only work in a narrow temperature range. Flooding, droughts, and a rise in the average temperature of the atmosphere are all direct consequences of global warming, as is an increase in the average temperature of the atmosphere. Increased contact between animals or the survival or availability of the agent on the environment's surface are all factors that contribute to the spread of infectious illnesses when the supply of water and fodder is restricted or when the environment changes. Probably, the creation of an effective and long-lasting animal health service, integrated monitoring and emergency preparedness systems, and long-term disease management and prevention programs will be the most essential method to coping with climate change in many nations. Successful adaptations to climate change may, as a result, prove to be a more effective method for dealing with the detrimental implications of climate change on cow health than unsuccessful adaptations. According to the researchers, the goal of this study was to investigate the potential consequences of climate change on animal health, poultry, and agriculture which was done via the use of a systematic strategy.

Keywords: Global, Climate change, Impact, Animal, Poultry, Agriculture

RGVAHS-2022-SA60

Smart livestock monitoring and management system using wearable internet of things and cloud services

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ABSTRACT:

Livestock plays a vital role in the agricultural economy of Pakistan. Despite its prime significance and the advancements in Information and Communication Technologies (ICT), smart livestock farming is not well adopted resulting in less production and revenue. Real-time monitoring and management is the essential need of modern farming as it provides assistance for animalâ€™s health surveillance, proper herd management, hazards forecast, and effective decision making. In this research, we propose an intelligent framework for smart livestock farming consisting of Wearable Internet of Things (WIoT) and Cloud services. The physiological, physical, and environmental parameters will be observed in real-time using the wearable device(s). Visualization, analysis, and predictions will be done by deploying the appropriate machine learning models on the cloud. Our proposed model will help in live monitoring of the animalâ€™s health status, physical and environmental conditions, and potential threats thus enabling farmers for effective and timely decision making for better productivity and sustainability.

Keywords: WIoT, Cloud computing, Machine learning, Smart livestock farming, Forecasting

RGVAHS-2022-SA61

Effect of heat stress on chickens reared in backyard poultry farming in Pakistan

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ABSTRACT:

The rapid and continuous increase in poultry production over the past few decades to meet the elevating protein requirements in Pakistan is leading to increased production challenged by the rapidly changing climatic conditions. One of the most prevailing climatic changes is Global Warming which has been affecting poultry farming in the form of increased heat stress. Changes in poultry farming strategies including the shifting of conventional open houses to environment-controlled sheds equipped with modern ventilation systems are being practiced for combatting heat stress. But unfortunately, these strategies are uneconomical and impossible to be adopted by all poultry farmers, especially backyard poultry farmers of Pakistan. Heat stress in backyard poultry birds causes several detrimental effects including poor growth rates, a decrease in meat quality, and its impacts on the growth of skeletal muscles. In the backyard or domestic birds, it has more drastic impacts as it increases the mortality rates due to stress-induced immunosuppression even though these breeds are hardy and resistant to diseases. Increased heat stress also stimulates the over-expression of genes responsible for protein catabolism while suppressing the expression of certain myogenic genes resulting in decreased protein contents. Various strategies are being used for combating heat stress including the use of herbs like Ginger, Fennel, Nigella sativa and the use of probiotics and vitamin E along with the introduction of heat-tolerant traits from certain heat-tolerant breeds. Further studies should be carried out to carry out genotype profiling of heat-tolerant breeds of chicken.

Keywords: Climate impact, Heat stress, Backyard poultry

RGVAHS-2022-SA62

Characterization of guar cultivar and their potential use in bakery products

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ABSTRACT:

Guar (*Cyamopsis tetragonoloba*) is a leguminous crop belonging to the family *"Fabaceae".* Guar beans are also known as *"Cluster beans"* and guar is a drought-tolerant crop. Guar has been cultivated in Pakistan for ages and used in the fresh form (as pods) and its pods are used as fresh vegetables and other parts are used as feed. Due to the high demand for guar

gum, this crop is known as a cash crop. Guar seeds contain protein 22.9-30.6%, carbohydrates 50.2-59.9%, fat 2.9-3.4% and ash 3.0-3.5%. Keeping in view the importance of guar, the current study was designed to characterize the guar cultivars and to assess their potential use in bakery products. In this study chemical composition of guar including moisture, fat, fiber, ash, protein, and carbohydrates were analyzed and guar gum was prepared from guar seeds. Afterward, guar gum powder was used as a fat substitute in cookies and cakes preparation. Products were investigated for texture, volume, color, diameter, spread factor, and sensory characteristics. Raw material characterization results were revealed that fat ranged from 3.93±0.48% to 4.59±0.03%, moisture 7.60±0.10% to 11.96±0.03%, protein 31.28±0.03% to 34.07±0.06%, fiber 4.76±0.01% to 5.16±0.09%, ash 4.33±0.17% to 5.86±0.11%, NFE 41.24±0.01% to 47.91±0.01%. In the case of cookies it was observed that cookies prepared with 15% guar gum were best for texture (33.18±0.58%), treatment T_1 (66.05±3.37%) showed the best color, and lower fat was found in treatment T_3 (9.36±0.35%). During a sensory evaluation, treatment T_1 (7.18±0.76%) got the best score. As for as cake is concerned, treatment T_1 (66.53±1.16%) was best in color, treatment T_3 was contained a higher volume (472±2%). It was found that fat can be reduced from 100 to 85% by using 15% guar gum in both cookies and cakes.

Keywords: Guar beans, Guar gum, Cash crop, Chemical composition, Fat substitute

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Long-term effect of governmental subsidies on livestock production systems- an ARDL data analysis approach

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ABSTRACT:

Livestock is a prominent sector of agriculture in Pakistan that contributes approximately 56% of value addition and nearly 11% to the gross domestic product (GDP). It plays a vital role in economical sustainability worldwide. To ensure food security to a population of more than 200 million, one of the key functions of the government of Pakistan is to maintain a stable production of livestock heads. However, the major initiative in this regard is the announcement

of subsidies for the livestock sector. This mechanism has been criticized on various forums based on the argument that Pakistan has been giving subsidies, especially on investment, purchase of animals, feed, and insurance. There is no doubt that subsidies have well addressed its short-term objectives, but it has adverse effects on the environment and economic efficiency in the long run such as overgrazing, soil degradation and adds to government deficits in general. This study gathered time-series data of the last 50 years (1970-2020) of different socio-economic and macroeconomic factors including total production, sectoral share in GDP, amount of subsidy on inputs, farm size, and world market prices. We analyzed the data using the Auto-Regressive Distributed Lag (ARDL) model that suggests that in the long run, the provision of subsidies is not ensuring high production of the dairy heads, on the other hand, this mechanism has a positive impact on the livestock production system which has its implications for the economy and welfare of the farmers.

Keyword: Livestock, Subsidy, ARDL, Time series

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Newcastle disease virus: A promising vaccine vector for veterinary and human viral diseases

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ABSTRACT:

Newcastle disease virus (NDV), a non-segmented negative-sense virus, is one of the major viruses of economic importance in the poultry industry throughout the world. Despite the availability of live virus vaccines of good potency, the intrinsic ability of attenuated strains to revert in virulence makes control of this disease by vaccination difficult. Armed with the

knowledge of virulence factors of this virus, it is now possible to produce genetically stable vaccines and to engineer mutations that enhance immunogenicity. The modular nature of the genome of this virus facilitates engineering additional genes from several different pathogens or tumor-specific antigens to design contemporary vaccines for animals and humans. Veterinary and human vaccines remained conventional for more than fifty years. Recent advances in the recombinant genetic engineering techniques brought forward a leap in designing vaccines for veterinary use. A novel approach of delivering protective immunogens of many different pathogens in a single virus vector was made possible with the introduction of a "reverse genetics" system for non-segmented negative-sense RNA viruses. It has been 20 years since Newcastle disease virus (NDV) was first used as a vector. The past two decades have witnessed remarkable progress in vaccine generation based on the NDV vector and optimization of the vector. Protective antigens of a variety of pathogens have been expressed in the NDV vector to generate novel vaccines for animals and humans, highlighting a great potential of NDV as a vaccine vector. With the progress of immunology, molecular biology and microbiology, the technologies for vaccine development evolve rapidly. In particular, recombinant virus vectors represent a powerful and promising platform to produce safe, immunogenic and efficacious vaccines without cultivating and handling live pathogens, especially those lethal for humans and animals.

Keywords: Newcastle disease virus, vaccine, vector, genetic engineering, immunology

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Understanding the dynamics of rice marketing system in Pakistan

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ABSTRACT:

Rice is the 2nd most important staple food crop Pakistan after wheat and ranked 3rd in areas items. In its overall production, Pakistan consumes 40-45% for domestic purposes and exports the remaining one which is more than 50%. The key objective of this study is to understand the value chain dynamics, economic efficiency, relationships, and marketing margins

to identify problems and recommend the appropriate measures to develop the sustainable value chain system of rice. The export volume of rice is gradually decreasing over the last few years due to the lack of government interaction as well as to meet the WTO and international standards. A semi-structured questionnaire was developed and pre-tested. Primary data were collected from 2 major rice-producing districts: Lahore and Gujranwala. 100 value chain actors were identified for the study. In addition, focus group interviews were undertaken with 20 selected key actors along the chain i.e., Farmers, contractors, millers, wholesalers, and retailers. Appropriate statistical techniques were employed to analyze the collected data to evaluate the value chain system of rice in Punjab. Results indicated that the wholesalers are enjoying most of the share in marketing margin as compared to the other actors. This study recommended the dire need for skilled labor and advanced machinery to reduce qualitative and quantitative losses in the rice industry of Pakistan. Moreover, lack of suitable agricultural and extension infrastructure as well as inadequate marketing information system is detected as a critical area in policy formulation. Stakeholders emphasized providing subsidies and development of microcredit institutions proceeding credits provision to rural growers by capacitating smallholder growers to use up-to-date agricultural machinery.

Keywords: Marketing margins, Value chain actors, Technical efficiency, Participatory approach

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Grape seed *proanthocyanidin* extract enhanced antioxidant capacity and immune function in broilers exposed to aflatoxin B_1

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ABSTARCT:

Aflatoxicosis is a major concern for the poultry industry. Grape seed *proanthocyanidin* extract (GSPE) is one of the most well-known and potent antioxidants. This study aimed to examine the efficacy of GSPE in the detoxification of AFB_1 in broilers. A total of 300 one-day-old Cobb chicks were randomly allocated into five groups (n = 60), Control; 1 mg/kg AFB_1 (AFB_1); GSPE 250 mg/kg; AFB_1 + GSPE 250 mg/kg (AFB_1 + GSPE 250 mg/kg); and AFB_1 + GSPE 500 mg/kg (AFB_1 + GSPE 500 mg/kg). The results showed that supplementation of GSPE on both levels significantly improved growth performance and immune function, as evident by increased body gain and immunoglobulin production (IgA, IgG, and IgM). Moreover, GSPE significantly mitigates AFB_1-induced oxidative stress by decreasing MDA content and increasing antioxidant enzymes activities (T-SOD, CAT, GSH, and GST). Furthermore, GSPE markedly reduced AFB_1 residue in the liver and muscles. Strikingly, the supplementation of GSPE to AFB_1 diets prevented injury to the hepatic parenchyma of broilers. Based on these findings, it can be concluded that dietary supplementation with GSPE protects broilers from aflatoxicosis induced by AFB_1.

Keyword: Aflatoxin B_1, Grape seed proanthocyanidin extract, Broilers, Antioxidant capacity, Immune function, Detoxification

RGVAHS-2022-SA67

Documentation of village pharmacy as Ecto parasite control in District Hyderabad Sindh Pakistan

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ABSTRACT:

The current study focused on the documentation of village pharmacy in various areas of the district Hyderabad, Sindh, Pakistan, for controlling ectoparasites on animals. Fifty cattle and buffalo farms were visited, and animals were checked for lice, ticks, mites and fleas. In addition, the village pharmacy was documented for the control of ectoparasites. In this research, ticks, lice,

and both ticks and lice infestations were found on 15 (30%), 12 (24%), and 17 (34%), respectively, whereas 6 (12%) were free of ectoparasitic invasion. Flea and mite infestation were not observed on the farms investigated. Moreover, 13 (26%) farmers used the village pharmacy for tick and lice control, 14 (28%) farmers used the village pharmacy for tick treatment only, and 10 (20%) farmers used the village pharmacy for lice control. Out of 37 farms infested with ectoparasites, 62% used Naas and sour oil, 19% used Naas and sweet oil, 11% used Kerosine oil, 5% used Paste of Mud, and 3% used Ginger on their animals. The buffalo farmers also informed that Naas and sour oil/sweet oil were combined and applied to the infected body area to control ticks and lice. On the other hand, Kerosene oil was used by rubbing the body region against ticks and lice. Similarly, mud paste was used to control ticks and lice by rubbing it on the affected body. Ginger has also been used to control ticks and lice by extracting its juice and applying it to the affected body regions of the animals.

Keywords: Village pharmacy, Naas, Ginger, Kerosine oil, Ectoparasites

RGVAHS-2022-SA68

Prevalence of Carbapenem-Resistant *Klebsiella pneumoniae* Infection and health professional's role in Multan, Pakistan: Epidemiological Data, Drug Resistance, and Reasons

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ABSTRACT:

The study aims at analyzing the epidemiological and clinical distribution of drug resistance of carbapenem-resistant *Klebsiella pneumoniae* (CRKP) strains, the minimum inhibitory concentrations (MIC), MIC50 and MIC90, and geographical distribution in Multan, Pakistan. The epidemiological data provides the basis to choose the best antibiotic scheme of treatment, prudent use of antibiotics and control of nosocomial infection. Study also looked at the logical reasoning for over use of these antibiotics by the clinical health professionals in the area. A total of 821 strains of CRKP were collected from September 2021 to January 2022 from

twelve different hospitals in Multan. Drug sensitivity test was used to determine the MIC and data was statistically analyzed by using SPSS. The detection rate of drug resistance of carbapenem-resistant *Klebsiella pneumoniae* (CRKP) strains increased from 10.5% to 11.1% weekly from September 2021 to January 2022. The first two weeks of September had CRKP of 10.5%, increased to 10.7% in last two weeks of September. Last week of December had seen the rise up to 11% which lead to 11.1% in January 2022. The ratio of males to females was approximately 2:1; 54.1%, 40%, 4.9%, and 1% were elderly, adults, minors and newborns respectively. The sample collected were primarily sputum (82.9%). The easy access to antibiotics over the counter, lack of proper training on antibiotic use among health professionals, urge to speed up the recovery, and overload of patients in the hospital were found the major risk factors for antibiotic abuse in the hospitals of Multan. The situation of CRKP resistance is getting worsen with every passing day in Multan, Pakistan. The resistance rate to most antibiotics is rapidly increasing and shows an upward trend. There is an urgent need to discourage the overuse of antibiotics in clinical setting. The study also concluded that training of health professional about prudent antibiotics use is very important to cope with this dangerous trend of over prescribing antibiotics This study could be a reference to highlight the prudent use of antibiotics, the better diagnosis, the well-planned treatment, and prevention of CRKP infection in our Multan, Pakistan.

Keywords: Antibiotic resistance, Carbapenem, Prevalence, Epidemiology