American International University-Bangladesh (AIUB)

SDG Activity Report - 2021

SDG 2:
Zero Hunger

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Contents

Faculty Research and Publication

Precision Agriculture in Bangladesh: Need and Opportunities

Author: Md. Asiful Islam et al.

Brief Description:

Agriculture being the socio-economic backbone of many developing countries (e.g., Bangladesh), still heavily depend on the farmer's experience, intuition, physical labour, mercy of nature for production. However, smart integration of technologies with the agricultural processes underpinned by Internet of Things (IoT) principles, can resolve these issues and maximize productivity. This approach (often termed as Precision Agriculture) can bring together agronomists, farmers and crops regardless of their geographical difference, and make agricultural information acquisition, evaluation and decision making autonomous and instantaneous.

This paper therefore contributes the followings, first, empirically investigate the status quo of agricultural practices and need in Bangladesh, second, glean the needs and requirements for shifting the status quo towards a knowledge driven smart automation system, and third, develops a platform for Precision Agriculture by leveraging the best practiced IoT design principles and contemporary technologies. Alongside, the transcript of validation highlighting the design and technical soundness of the system is presented.

Source: http://sersc.org/journals/index.php/IJAST/article/view/28079

Effect of Biochar and Fertilizer Application on the Growth and Nutrient Accumulation of Rice and Vegetable in Two Contrast Soils

Author: Md. Faruque Hossain et al.

Brief Description:

This study investigated the impact of Biochar and fertilizer, applied independently and simultaneously, on plant growth response and nutrient uptake from two contrasting tropical soils. One commonly cultivated winter vegetable (Amaranthus lividus) and a high yielding rice variety (BR-48) was grown on both the soils. Eight different treatments namely control, only fertilizer, three different biochars (farmyard manure, water hyacinth and domestic organic waste) with and without recommended fertilizer doses were used in the experiment. Soils with biochar treatments received 10 tons ha-1 of biochar. Results revealed that, Biochar treatments alone could enhance the yield of Data Shak 17-64% for Sara soil and 17-42% for Kalma compared to only fertilizer application. Farmyard manure biochar (FM) was most effective in case of Sara and Domestic organic waste biochar for Kalma. Synergistic effect of biochar and fertilizer was most prominent in terms of vegetable yield. Biochar and fertilizer applications had positive effects on N, P, K and S uptake however that varied with soil type. Farmyard manure Biochar significantly increased P uptake in vegetable and fertilizer application facilitated K intake at 1% significant level. Rice straw yield were significantly affected by fertilizer application. Synergistic effect of Biochar and fertilizer treatments increase the yield by 16-23% in Sara and 12-49% in Kalma compared to that of only fertilizer application. Only Biochar application sometimes caused reduction in yield, even from the control treatment. Effect of biochar and fertilizer treatments on macronutrient (N, P, S and K) uptake of rice plant was significant at 0.1% level at both the soils. Fertilized domestic organic waste biochar application facilitated highest N uptake in rice plants both in straw and grain. This highly significant uptake of nutrients could be due to the increased crop yield by biochar and fertilizer application together, which might be the best practice for tropical soils.

Source:
https://www.researchgate.net/publication/331175781_Effect_of_Biochar_and_Fertilizer_Application_on_the_Growth_and_Nutrient_Accumulation_of_Rice_and_Vegetable_in_Two_Contrast_Soils

Precision Agriculture in Bangladesh: Need and Opportunities

Author: Kaniz Fatema et al.

Brief Description:

Agriculture being the socioeconomic backbone of many developing countries (e.g., Bangladesh), still heavily depend on the farmer's experience, intuition, physical labour, mercy of nature for production. However, smart integration of technologies with the agricultural processes underpinned by Internet of Things (IoT) principles, can resolve these issues and maximize productivity. This approach (often termed as Precision Agriculture) can bring together agronomists, farmers and crops regardless of their geographical difference, and make agricultural information acquisition, evaluation and decision making autonomous and instantaneous. This paper therefore contributes the followings, first, empirically investigate the status quo of agricultural practices and need in Bangladesh, second, glean the needs and requirements for shifting the status quo towards a knowledge driven smart automation system, and third, develops a platform for Precision Agriculture by leveraging the best practiced IoT design principles and contemporary technologies. Alongside, the transcript of validation highlighting the design and technical soundness of the system is presented.

Source:
https://www.researchgate.net/publication/342851355_Precision_Agriculture_in_Bangladesh_Need_and_Opportunities

Consumers' Awareness and Acceptance of Grocery Shopping from the Online Platforms

Author: Hamidul Islam et al.

Brief Description:

According to the Central Bank of Bangladesh's report, the growth and total e-Commerce transactions held during the Covid-19 pandemic were remarkable (Bangladesh Bank, 2021). Studies indicated that due to technological advancements and customers' interests, "Online Shopping" has gained substantial popularity. Grocery products are considered one of the prime items in consumers' shopping lists. During the Covid-19 pandemic, people have experienced various convenient purchasing options from online marketplaces. Therefore, the researchers have taken this initiative to analyze and identify the dimensional factors that impact consumers' awareness and acceptance of purchasing their grocery items from online platforms. The researchers followed the quantitative approach to collect and analyze the data using a non-probability purposive sampling method. A total of 673 responses were analyzed in Bangladesh's urban, suburban, and rural areas. In addition, a self-administrated questionnaire was created on the prior studies related to the Unified Theory of Acceptance and Use of Technology (UTAUT). The collected data were analyzed with SPSS 23 version. The study outcomes show a significant positive relationship between the customers' awareness and acceptance of online grocery shopping. The results identified that the behaviors of the consumers are highly affected by the User Influence, User Experience, Facilitating Conditions for enhancing consumers' awareness, and the Payment Methods and Awareness factors, respectively, impact the acceptance of online grocery shopping. The significant findings would eventually benefit online marketers in articulating effective strategies to penetrate the market for future business sustainability.

Source: https://ajbe.aiub.edu/index.php/ajbe/article/view/124

FruitDet: Attentive Feature Aggregation for Real-time Fruit Detection in Orchards

Author: DR. MUHAMMAD FIROZ MRIDHA et al.

Brief Description:

Computer vision is currently experiencing success in various domains due to the harnessing of deep learning strategies. In the case of precision agriculture, computer vision is being investigated for detecting fruits from orchards. However, such strategies limit too-high complexity computation that is impossible to embed in an automated device. Nevertheless, most investigation of fruit detection is limited to a single fruit, resulting in the necessity of a one-to-many object detection system. This paper introduces a generic detection mechanism named FruitDet, designed to be prominent for detecting fruits. The FruitDet architecture is designed on the YOLO pipeline and achieves better performance in detecting fruits than any other detection model. The backbone of the detection model is implemented using DenseNet architecture. Further, the FruitDet is packed with newer concepts: attentive pooling, bottleneck spatial pyramid pooling, and blackout mechanism. The detection mechanism is benchmarked using five datasets, which combines a total of eight different fruit classes. The FruitDet architecture acquires better performance than any other recognized detection methods in fruit detection.

Source: https://www.mdpi.com/2073-4395/11/12/2440

Impact on consumer psychology towards Shopping Behavior during COVID-19 pandemic

Author: AKM KAMRUL HAQUE et al.

Brief Description:

Much has been talked about around the alternative of buying items among the distinctive segments of the supply chain during the global pandemic. However, consumers are learning to contrive and learn modern propensities due to lockdown and social separating mandates. I focus on explaining the adjustment of modern structure of consumer behavior during post pandemic. I collect and analyze the interviews from twelve respondents from the different segments (consumer and retailer) in northern part of Dhaka. We find that consumer behavior on online shopping is being changed in an emergency and steps of typical supply chain may be changed for a while during global pandemic. At exceptionally stating of emergency, consumers expend a huge sum of ingredients instead of a wrapped-up food and also lean toward purchasing the items from the branded retail shop through online. Consumer's new habits emerge with the advance technology, demographical change and innovative ways of learning to cope with blurring the shopping behavior in the ongoing pandemic situation. This change towards more technologybased communication will coordinate understudies to proceed with their learning and engage virtual mentoring to empower consumers.

Source: https://www.ijser.org/researchpaper/Impact-on-consumer-psychology-towards-Shopping-Behavior-during-COVID-19-pandemic.pdf

Risk assessment of lead distribution in soils, rice (Oryza saliva L.) and wheat (Triticum aestivum L.) in Damietta governorate, Egypt

Author: PROFESSOR DR. MD. FARUQUE HOSSAIN et al.

Brief Description:

Grains of rice and wheat are important food as a cereal crop in Egypt as in the world. Recently, the lead (Pb) content of soils and plants increased as a result of different pollutant sources causing negative environmental impacts. Therefore, this study aimed to estimate the level of Pb in the soils, rice and wheat plants of Damietta governorate cultivated area and evaluate its impact on human health. Results shows that soil total Pb in the surface layer (26.7 ± 11.1 mg kg-1) are higher than the subsurface layers (1.27 ± 0.13-fold) due to its low mobility with soil depth. The

DTPA extractable Pb in the surface layers (0.69 ± 0.50 mg kg-1) are also higher than subsurface (1.35 ± 0.42-fold) and represents a small fraction from total (2.39 ± 1.1%). Moreover, DTPA extractable Pb shows a significant positive correlation with total soils Pb (r2 = 0.73) and organic matter content (r2 = 0.82), on the other hand, a negative correlation with the soil pH (r2 = - 0.76). Rice grain Pb concentrations (0.09 ± 0.02 mg kg-1) is lower than straw (0.72 ± 0.12 mg kg-1), which represents 12.6% ± 1.70-fold. A significant correlation is found between rice grains and straw Pb content (r2 = 0.95) that also increasing soil DTPA extractable Pb rice straw (r2 = 0.91) and grains (r2 = 0.93). On the other hand, wheat grain Pb concentrations (0.08 ± 0.024 mg kg-1) is lower than straw (0.63 ± 0.19 mg kg-1), which represents 11.9% ± 1.74-fold. However, a significant correlation is found between wheat grain and straw Pb concentrations (r2 = 0.92) that also by increasing soil DTPA extractable Pb wheat straw (r2 = 0.82) and grains (r2 = 0.75). Rice and wheat grains Pb concentrations are lower than the permissible limits according to WHO/FAO and EU (0.20 mg kg-1) and no potential human health risk is concluded yet. Key words: Lead; rice (Oryza sativa L.); wheat (Triticum aestivum L.); grains; Egypt

Source:
https://www.researchgate.net/publication/351713190_Risk_assessment_of_lead_distribution_in_soils_rice_Oryza_saliva_L_and_wheat_Triticum_aestivum_L_in_Damietta_governorate_Egypt

The power of demand chain management in supply: A focus on perishable items in Bangladesh during COVID-19

Author: AKM KAMRUL HAQUE et al.

Brief Description:

Much has been discussed about the resilience factors of supply chain management of trade organizations after the global pandemic. We have observed how each and every step of supply chain management is very critical for the resilience of businesses globally, especially in healthcare and food recently. This article focuses on illustrating the benefit of retailer and customer interaction, and the downstream supply chain, for perishable items during the global pandemic. Respondent interviews were captured and analyzed from mobile retailers and customers involved in the buying and selling of perishable items. We find that mobile retail sales have grown when the retailer or 3PL is operating with the demand-side customers in mind during the global pandemic – a theory referred to as demand chain management. Customers purchase perishable items from mobile retailer entrances, while accounting for social distancing, while the retailers are able to sell their products to the customer through this channel during the crisis.

Source: https://ajbe.aiub.edu/index.php/ajbe/article/view/3