Journal of Scientific & Industrial Research

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This investigation is the stochastic version of our previous work in which it is required to find the locations of a number of new facilities in a prescribed circular area constraint around the centre of gravity of a given number of existing facilities where the weights considered in the objective function are the random variables with discrete probabilities and the distance between the facilities is Euclidean. It has been assumed that the existing facilities are of one kind and the new facilities are of different kind with interactions between existing and new facilities as well as amongst new facilities. The stochastic multifacility location problem with circular area constraint has been formulated and solved by using Kuhn-*Tucker* conditions. A numerical example has also been solved by using the proposed method. Thus the outcome of the present work is a new method of finding the solution of a constrained stochastic multifacility location problem where the existing facilities are of one kind and the new facilities are of different kind.

Product innovations are one of the most critical driving forces for business developments and competitive advantages. However, commercialization of innovations and a proper pricing strategy for the innovative products is needed to pursue the market value as well as the premium profits. A firm's pricing decision is regarded as one of the most business challenges in a competitive market, especially in dual competition and oligopolistic market. Although previous studies have addressed the tactics of price competition with diverse models, there is a need for systematic analyses regarding the dynamic price competition and a firm's strategic decision for innovative products. In this paper, System Dynamics (SD) methodology was adopted to propose a simulation-based Strategy Dynamics Pricing Model (SDPM) as a decision support system. Through iterative computer simulations, the impact of product innovations and the dynamic price competition in oligopolistic market could be systematically analyzed. Strategic pricing decisions for product innovations and market competition would be enhanced with the analysis for better innovation management.

The production control systems in industries become a significant pre-requisite for its success. The pull control systems could be a systematic approach for the effectiveness of production systems. This paper covers the investigation and performance analysis of Constant Work in Process (CONWIP), Kanban Control System (KCS) and Extended Kanban Control System (EKCS) using real time industrial problem. The industry manufactures two gears of different diameters and the demand for each is 20 per day. The CONWIP, KCS and EKCS are modeled as network diagrams in MATLAB-SIMULINK and simulated. The performance of EKCS is optimal as compared to KCS and CONWIP. The EKCS was implemented for one month and the production is increased by 54%.
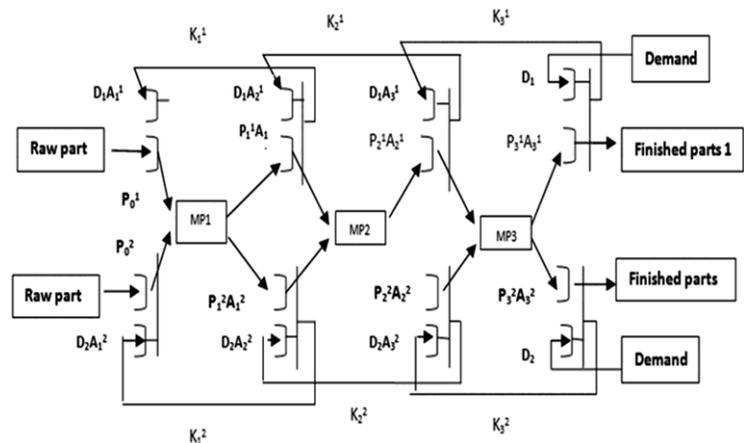
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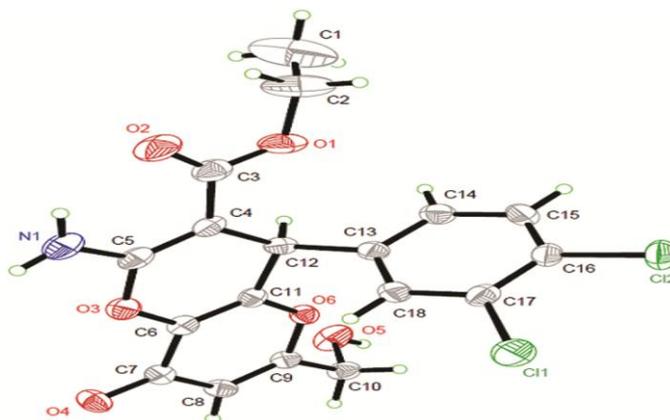
S & T and Industrial Research

Physiologically mature freshly harvested Dashehari, Chausa and Langra mango fruits were subjected to 100 ppm ethylene dosing for 24 hours in a ripening chamber maintained with $24 \pm 2°C$ temperatures, 95% relative humidity. After 48 hours holding in chamber, ripened fruits were taken out and stored at ambient condition ($25 \pm 2°C$, $85 \pm 5\%$ RH) for 8 days. Dashehari reached to optimum soft eating stage on the 4th days after ethylene dosing. Chausa and Langra reached at optimum ripening stage on 6th day, while Dashehari spoiled and could not be stored further. Chausa and Langra lasted up to 8 days in storage, while their response to ethylene was found different. Ethylene evolution peak was observed maximum (1.81 µl C2H4 kg-1 h-1) in Dashehari and lowest (0.40 µl C2H4 kg-1 h-1) in Langra on 4th day of storage. Climacteric peak was declined on 8th day and lowest peak (0.31 µl C2H4 kg-1 h-1) was noticed in Langra fruits closely followed by Chausa. Finally we found ethylene sensitivity of these three varieties as Dashehari <Chausa < Langra.

R Asrey, V R Sagar, K Kumar & S Sharma
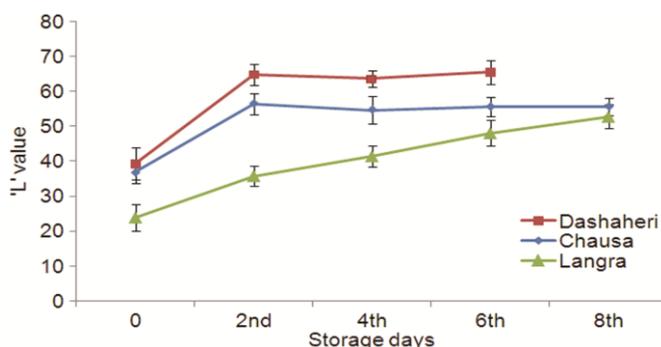
As the persistent resistance of Staphylococcus aureus to available antibiotics is associated with high infection incidence, mortality rate and treatment cost, novel antibacterial agents with innovative therapeutic targets must be developed. Four novel pyran derivatives (1-4) were synthesized and characterized via IR, 1H NMR, HRMS, and single crystal X-ray crystallography. The antibacterial activities of the four compounds were investigated against Salmonella paratyphi A and Enterococcus faecalis by MIC and MBC assay. It was found that compared with compounds 1 and 2, compounds 3 and 4 exerted rather potent activities against the two cell lines.

**Wen-Jing Hao, Xiao-Yan Xu, Dai-Zun Zhang & Rui Han**

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Energy and Environment

A study was conducted to develop allometric equations by destructive sampling of selected trees for prediction of biomass in Pongamia using easily measurable attributes (collar diameter, tree height, crown width and depth) and test the reliability of these relationships using an independent dataset from different management situations. Allometric models based on collar diameter, followed by crown width, showed better fit statistics as compared to the models based on other input variables. Crown depth has shown relatively weak link with the biomass parameters. Collar diameter was found to be the key driver in determining the biomass variables and number of branches. The results obtained with an independent data set validated the trained models.
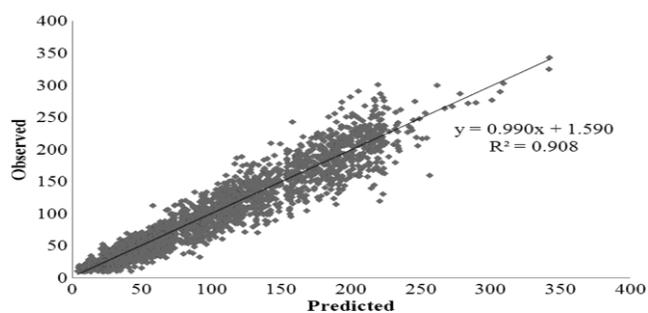
G R Rao, B M K Raju, P Sathi Reddy & P Sharath Kumar

Author-Reader Platform

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