

Production structure of trout aquaculture industry in Chahar Mahal Bakhtiary province, Iran

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Abstract

Production structure of trout aquaculture industry in the Chahar Mahal Bakhtiary Province of Iran were studied to identify the probability of reduction in production cost. The approach given in Duality theory was found useful and the system of Translog cost function and cost share equations using pooled time series-cross section data were jointly estimated. The result of estimates showed that the production structure of the industry was non-homothetic implying that any change in the output level or scale could affect the cost shares. It was found out that the industry was labor and capital saving, and food and fish (larva) intensive. The estimated Allen partial elasticity of substitution showed the substitutability of inputs, except complementary relation of larva with food and labor. The results of study on own-price elasticities of demands in absolute values indicated that demands for labor, capital and food inputs were inelastic to changes of their price in trout aquaculture industry. In addition, the demand for food was less responsive to change in price of labor, capital and food inputs than responsivity of demand for these inputs to change in food price.

Keywords: Production structure, Trout aquaculture, Scale economics, Factor substitution, Elasticity of demand, Translog cost function

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Life table parameteres of *Hippodamia variegata*
(Col.: Coccinellidae) on *Aphis fabae* (Hom.: Aphididae)
under laboratory condition

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Abstract

In this study, life table parameters of the lady beetle *Hippodamia variegata* Goeze on *Aphis fabae* Scopoli were studied under laboratory condition. Ten pairs of male and female adults of the lady beetle were released into a cage (6×11×23 cm) separately. Experiments were carried out in a growth chamber at 25±1^oC, 65±5 RH and 16:8(L:D) photoperiod. Parameters including age (x) and surviving from birth to exact ages (x) were used for calculation of life table parameters such as number of survival (l_x), age specific mortality (q_x) and life expectancy of the lady beetle (e_x). The most basic life table (Fecundity subtable) parameters such as number of female produced (m_x), Intrinsic rate of increase (r_m), Net reproductive rate (R₀), mean generation time (T) and Doubling time (DT) were also calculated. Results revealed high potential of lady beetle to control *Aphis fabae* Lady beetles survived 31- 70 days. Age specific mortality (q_x) began at 30th day and the highest rate of this parameter was observed at 69th days. Life expectancy was 51.02 at the initiation of development. Mean fecundity was 943.9 ± 53.53 eggs and sex ratio was 0.7. Intrinsic rate of natural increase, net rproductive rate, mean generation time and doubling time were estimated 0.287 female/female/day, 509 female/generation, 21.7 and 2.4 days, respectively.

Keywords: *Hippodamia variegata*, *Aphis fabae*, Life table, Intrinsic rate of natural increase

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Data-based mechanistic modeling of rainfall-runoff process, case study: upper Karoun subbasin data analysis

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Abstract

A major part of hydrological researches focused on complex and non-linear rainfall-runoff process. Mathematical models were presented to describe this process including a wide range from simple black-box representation to complex physically-based models. Considering inherent uncertainty associated with the process as a result of uncertain input variables and uncertain calibrated parameters, stochastic modeling seemed preferable to deterministic approaches. In this study, data-based mechanistic modeling (DBM) was selected to identify non-linearities of the process. The method is categorized as a stochastic approach relying upon recursive parameter estimation using Kalman filtering algorithm in state space system of equations. In addition, it is capable to reflect a physical interpretation of rainfall-runoff conversion to describe the behavior of the system. The later capability differs it from other black-box modeling approaches. In this research, a parallel structure of flow routes was identified in upper-Karoun subbasin of the great Karoun catchment. Sensitivity analysis was also carried out based on Monte Carlo simulation (MCS) method and the reliability of the presented model were quantified.

Keywords: Data-based mechanistic modeling, Rainfall -runoff process, Recursive estimation, Linear store model, Parallel flow process.

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Allelopathic effects of *Chenopodium album*, *Amaranthus retroflexus* and *Cinodon dactylon* on germination and growth of rapeseed

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Abstract

This research was conducted to evaluate the allelopathic effects of root and shoot extracts of three abundant weeds of rapeseed fields in Iran including: *Chenopodium album*, *Amaranthus retroflexus* and *Cinodon dactylon* on germination and growth stages of rapeseed. Experimental design was factorial based on completely randomized design (CRD) at three replicates. Treatments were control and shoot and root extracts of the mentioned weeds. Results revealed that studied weeds disturbed rapeseed germination and growth by producing allelopathic substances. Weed extracts influenced seedling length, seedling dry weight, germination percentage and germination duration. *C. album* shoot extract and root extract of *C. dactylon* inhibited rapeseed germination at all. In laboratory tests, extracts of other parts of the weeds inhibited seedling dry weight and length up to 41.6% and 98.28%, respectively. In greenhouse experiments, weed extracts affected root and shoot dry weight, leaf area, and biomass of rapeseed, significantly. They also decreased rapeseed root length at least 5.82% and its biomass up to 82.87%.

Keywords: Allelopathy, *Amaranthus retroflexus*, *Chenopodium album*, *Cinodon dactylon*, Germination, Growth, Rapeseed

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Study of phenotypic characteristics of potato bacterial wilt isolates in Fars and Hamedan provinces, Iran

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Abstract

In order to study of Phenotypic characteristics of potato bacterial wilt isolates, several potato fields were surveyed for potato wilt plants in Fars and Hamadan provinces of Iran during 2000-2002. The infected samples to potato wilt were collected and screened for bacterial infection under laboratory condition. Isolation and purification of suspected bacterial samples were done on TTC (2,3,5-triphenyl tetrazolium chloride) culture medium. Characteristics of bacterial isolates were determined on the basis of colony morphology, biochemical differentiations, pathogenicity and antibiotic sensitivity tests as well as whole cell protein analysis. In this study, a typical HR symptom was observed in infiltrated tobacco leaves after 24-48 hours. All isolates were assigned in race 3 biovar 2, based on the pathogenicity tests on tomato and potato seedlings and utilization of defined carbohydrates by isolates. Utilization of glucose, sucrose and trehalose were positive for all isolates, whereas it was negative for ramnose, raffinose, arabinose, fucose and tartrate. H₂S production from cysteine, urease, oxidase, catalase and utilizing of sodium citrate were positive, while indole, methyl red, arginine dihydrolyase, gelatin and starch hydrolysis and utilizing of malonate and gluconate were negative. In bacterial cell membrane protein analysis using SDS-PAGE method, no significant differences were observed in electrophoretic patterns of local and standard strains (ACH 0158 from Australia and CIP 10 from Peru) and only strain RsR79 was a little different from others.

Keywords: Potato bacterial wilt, *Ralstonia solanacearum*, Phenotype, Isolate

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The Study on the effect of tobacco, harmel and thymus Plants on *Varroa*, a honey bee parasite

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A. Ahmadzadeh²

Abstract

Varroa is one of the most dangerous honey bee parasites, which causes serious damages to the bee industry. By now, various herbal and chemical drugs had been used against the parasite. In this research, the effect of 7 treatments including: tobacco, harmel and, thyme extracts, tobacco, harmel and thymus smokes and a control were studied on *Varroa* in 21 honey bee colonies as a completely randomized design (CRD) at three replications. The rate of hive contamination to *Varroa* at the beginning and end of the experiment and daily rate of *varroa* and worker bee mortality were recorded. There was no significant difference between experimental hives in view point of contamination to *Varroa*, at the beginning of the study. However, significant dissimilarity was found out among treatments at the end of experimental period. Mortality rate of *Varroa* in different days and the whole period of the study was significantly different in treatments. Results revealed that tobacco and harmel extracts caused the most *Varroa* and honey bee mortality, respectively.

Keywords: Honey bee, *Varroa*, Tobacco, Harmel, Thymus.

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Effect of alternate furrow irrigation method on grain yield and water use efficiency of common bean genotypes

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Abstract

A field experiment was conducted in order to investigate the effect of alternate furrow irrigation on yield and water use efficiency (WUE) of common bean genotypes in Karaj, Iran during 2005 - 2006. The experimental design was split plot based on randomized complete block design (RCBD) with 4 replications. Three furrow irrigation methods including: alternate furrow irrigation (AFI), fixed furrow irrigation (FFI) and conventional furrow irrigation (CFI) methods were considered as main factor and three genotypes of Akhtar, Derakhshan and D81083 line were planted in subplots. Results showed no significant difference between the effect of AFI and FFI methods on grain yield of bean genotypes. However AFI decreased grain yield of line D81083, Akhtar and Derakhshan cultivars up to 10.2, 32.5 and 30.9 percent in comparison to CFI method, respectively. Line D81083 showed higher water use efficiency than other two studied genotypes. Irrigation water use efficiency of Akhtar and Derakhshan cultivars and line D81083 was also increased by AFI in comparison to CFI method up to 9.2%, 11.9% and 52.9%, respectively.

Keywords: Alternate furrow irrigation, Common bean, Water use efficiency, Grain yield

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Effect of water stress at different growth stages on yield and yield components of Kidney bean cultivars

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Abstract

Investigation on the effect of water stress on crop yield is very important in Iran duo to arid and semiarid climates and limited water resources. In this research, a field experiment was conducted in research station of Zanjan University as split plot based on randomized complete block design (RCBD) with three replications. Water stress application at different growth stages including: vegetative (V), flowering (F), poding (P) stages were considered as main factor and kidney bean cultivars of Sayad, Akhtar, Derakhshan, Naz and D- 81083 were placed in subplots. Irrigation index was decreasing 50 mm from evaporation pan (class A) and addition 50 mm for each water stress treatments. Measured traits were number of grains per pod, number of pods per plant, length of pod, 100 kernel weight, grain yield, biological yield and harvest index. Analysis of variance showed that there was significant differences between cultivars, stage of water stress application and their interaction in grain and biological yield of common bean. Results revealed that Sayad had better performance than other cultivars and high sensitivity of cultivars was observed to water stress at flowering stage. The greatest biological and grain yield was observed in Sayad cultivar in control (non stress treatment) and Naz in V treatment. The lowest value of the mentioned parameaters were observed in Akhtar cultivar in F treatment. In addition, Sayad had higher harvest index in control. Number of pods per plant and grain per pod were significantly reduced in F treatment and 100 kernel weight in treatment P. Among cultivars, Sayad produced more pods per plant and grain per pod, and Akhtar showed the highest 100 kernel weight. Grain yield showed significant positive correlations with harvest index and biological yield, but it had negative relationship with 100 kernel weight and number of pods.

Keywords: Kidney bean, Water stress, Grain yield, Biological yield, Harvest index

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Investigation on the effect of nitrogen and micronutrient amounts and fertilizing methods on corn (S.C. 704) yield in Kerman condition, Iran

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Abstract

In order to investigate the effect of nitrogen and micronutrient amounts and fertilizing methods on corn (S.C. 704) quantity, an experiment was carried out at research station of Islamic Azad University, Kerman branch in 2005. The experimental design was the split split plot based on completely randomized block design (BCRD) with 3 replications. Source of nitrogen fertilizer, Urea, were considered in three levels (300, 450 and 600 Kg/ha) as the major plots with ($\frac{1}{2}$ and $\frac{1}{3}$) fertilizer divide methods of each as the subplots. The micronutrient factor was also considered in two levels (0 and 3 ppm) as sub-subplots. Cultivation was performed as furrow system with 75cm between rows and 15cm between plants on the rows in 30th April. Nitrogen fertilizer was sprinkled in three time stages: synchronous with cultivation and 4 and 8 leave stages through fertilizing methods. The micronutrients was also sprinkled in 4 leave stage in two consecutive weeks. Plants were selected from 5m² of three middle rows for determination of grain and biological performance at physiological ripening time. 15 plants were also selected randomly for measuring yield components. The quantity characteristics of corn, number of row in each corn, number of seed in each row, total weight of plant and weight of 1000 seeds were determined. According to the results, using 600 Kg/ha of Urea with $\frac{1}{2}$ fertilizer dividing method resulted in higher yield than other treatments. Also, micronutrient application at 3ppm level only significantly improved total weight of plants and weight of 1000 seeds.

Keywords: Corn, Nitrogen, Micronutrient, Fertilizer, Single cross 704.

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