

Article 1:

Selection of inbred rice varieties and identification of planting density on grey soil area of Hiep Hoa district, Bac Giang province

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Abstract

Two separate experiments were carried out on grey soil area of Hiep Hoa district, Bac Giang province in Spring and Summer crop seasons of 2013 and 2014. The result of varietal comparison among 10 studied showed that variety BC15 was suitable to grey soil area of Hiep Hoa district, Bac Giang province in both Spring and Summer crop seasons. Variety BC15 had high grain quality, short growth duration (110 days in Summer and 125 days in Spring season), good tillering ability; filled grains per panicle ranged from 94.4 in Summer to 116.9 in Spring crop season. Grain yield of BC15 was obtained at 68.1 quintals per ha in Spring and 61.0 quintals per ha in Summer crop season and was significantly higher than that of control Khang Dan 18. The experiment of planting density with 20, 30, 40, 50 and 60 hills per square meter for BC15 showed that most suitable planting density was 30-40 hills per square meter in both Spring and Summer crop season. The number of panicles per square meter at planting density of 30 - 40 hills was significantly lower than that of 50 and 60 hills, but it was higher in the number of filled grains per panicle and 1,000 grain weight, so that the obtained grain yield was significantly higher and reached 70.1 - 72.8 quintals per ha in Spring and 62.1 - 64.7 quintals per ha in Summer crop season.

Keywords: BC15 rice variety, planting density, Hiep Hoa, grey soil, yield, spring season, summer season

Article 2:

Result of evaluation and selection of 12KT3-1 potato variety

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Abstract

The result of evaluation, selection and testing of 12KT3-1 potato variety showed that the growth and development of this variety were at very good level (5 points), low level of pest infestation and high yield potential, from 20 to 30 tons/ha. The dry matter content was > 18%, good quality for eating, suitable for fresh consumption market. The tubers are of oval shape, nice shiny yellow shell and yellow pulp. The 12KT3-1 potato variety meets the demand of domestic consumer market as well as for export.

Keywords: Potato variety 12KT3-1, high yield, quality

Article 3:

Selection of “Sanh orange” elite trees grown in Ham Yen district, Tuyen Quang province

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Abstract

Sanh orange (*Citrus nobilis* Blanco) has been concentratedly cultivating in Ham Yen district, Tuyen Quang province and plays an important role in improving local livelihood but this orange variety is characterized by seedy fruits and a bit sour resulting in lowering benefit. 17 villages of 7 communes in Ham Yen district were selected for surveying and 750 survey forms were filled up. 20 individuals of Sanh orange variety were identified as elite ones and 19 (95%) out of them were propagated by grafting and 19 (95%) individuals had the age of more than 8 years old with orange color of fruit skin and flesh which were special for this orange variety. Two individuals coded as PL01 and PL02 had the edible ratio of more than 65%; other 8 individuals coded as YL03, YL06, YL07, TT03, TT04, PL01, PL02 and PL05 had sugar Brix over 12%; 4 individuals as PLNN01, PLNN02, PL01, PL02 had 10 - 12 seeds/fruit. 2 individuals had high yield (255 g/fruit for PL01 and 262 g/fruit for PL02) and the yield of PL02 was stable in 3 years. Of two primarily selected individual trees, PL 02 was recognized by the Dept. of Agriculture and Rural Development of Tuyen Quang Province as Sanh orange elite tree with the code C.CAMSANH.08.074.02392.15.01 because of its regular yield (228 kg in 2015), high edible part percentage (more than 65%) and few seeds (less than 12 seeds/fruit).

Keywords: *Citrus nobilis* Blanco, PL02, Sanh Ham Yen orange, seedless orange

Article 4:

Evaluation of tolerant ability of Vietnamese rice germplasm to abiotic stresses

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Abstract

Rice germplasm evaluation is a crucial step so that suitable parental lines can be selected for MAGIC breeding program. 146 Vietnam rice varieties/lines were phenotyped for submergence, salinity and drought tolerances and genotyped for QTLs response for these traits. By phenotyping experiments, 5 lines were identified to be high tolerant to submergence (ML202, PY1, AN4 and OM8923, Q5), 1 line was moderate tolerant to 9‰ salinity (Độc Trắng) and 16 lines exhibited potential yield performance under drought stress. In parallel, genotyping analysis using 52 SNP markers revealed genetic patterns of 83, 1 and 44 lines which resemble haplotypes of effective alleles of *SUB1*, *qDTY_{3.1}* and *qDTY_{12.1}* respectively. These SNP markers, particularly, helped constructing a cladogram in which group of improved lines was clearly distinguished from that of landraces.

Keywords: Rice, submergence tolerance, salinity tolerance, drought tolerance, single-nucleotide polymorphism

Article 5:

Evaluation of resistance to pests and diseases of rice variety KR1

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Abstract

This study was conducted to evaluate resistant levels of new rice variety KR1 to main pests and diseases including brown plant hopper, blast disease, bacterial blight and sheath blight. The disease sources collected from 5 provinces in the North Vietnam including Hai Phong, Ha Noi, Hung Yen, Bac Giang and Thanh Hoa. The results showed that variety KR1 was resistant to brown planthopper collected from Hai Phong and Ha Noi at levels 1 - 3, medium resistant to brown planthopper collected from Thanh Hoa, Bac Giang and Hung Yen at a

degree of 3. Variety KR1 was medium resistant (scale 4 - 5) to bacterial blight collected from Ha Noi, Hai Phong and Bac Giang, light sensitive (scale 5 - 6) to bacterial blight collected from Thanh Hoa và Hung Yen. For the blast disease, KR1 was resistant at level 3 to the disease sources collected from Ha Noi and Bac Giang and medium resistant (scale 3 - 5) to the disease source collected from Hai Phong, Thanh Hoa and Hung Yen. The variety was sensitive to sheath blight collected from 5 provinces at the degrees of 5 - 7.

Keywords: Bacterial blight, blast, brown plant hopper, disease, rice, sheath blight

Article 6:

Determination of genetic polymorphism of citrus cultivars in Ham Yen district, Tuyen Quang province by PCR- RAPD

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Abstract

Polymerase chain reaction - Random amplified polymorphic DNA (PCR - RAPD) was used to assess polymorphism of 20 cultivars of citrus collected in Ham Yen district, Tuyen Quang province. 979 DNA fragments were randomly amplified by using 10 RAPD primers and grouped into 82 banding patterns; of which 69 (84.14%) were polymorphic. All of 10 primers showed polymorphism. The genetic polymorphism between orange and tangerine ranged from 0.53 to 0.69. Twenty cultivars collected from Ham Yen district were divided into 4 groups in which the genetic distance varied from 0.53 to 0.96. Three cultivars including CSPL2, SHY1 and SHY2 showed higher genetic similarity (0.84 - 0.92) comparing to that of seedless cultivars including SKH/M1 and SKH/M3.

Keywords: Ham Yen orange, LD6 orange, Mat orange, V2 orange, PCR-RAPD

Article 7:

Effects of Urea-Gold45^r on rice growth and grain yield in acid sulphate soils of the Mekong delta

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Abstract

The research was carried out on acid sulphate soil in Hoa An village, Hau Giang province in order to evaluate the effect of Urea Gold on spore density, root penetration of Endomycorrhizae fungi, and rice agronomic traits, grain yield. The experiments were conducted in randomized complete block design with 7 treatments. The results showed that Urea-Gold (Endomycorrhizae) gave high spore density, root penetration and diverse spore shapes of the endomycorrhizae. Urea-Gold fertilizer with a dose of 80% protein + 70% phosphorus had the highest number of spores and penetration rates of Endomycorrhizae; the agronomic traits, root weight, yield and profit were equivalent to that when applying a dose of 100% nitrogen + 100% phosphorus.

Keywords: Acid sulphate soil, Endomycorrhizae, Urea-Gold

Article 8:

Effects of fertilizing techniques on cutting yield and growth of tea cuttings of purple Trung du tea variety in the nursery in Thai Nguyen province

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Abstract

The effects of fertilizing techniques on cutting yield and growth of tea cuttings of purple Trung du tea variety in the nursery in Thai Nguyen province for enhancing the ability of multiplication of this tea variety showed that applying 20 tons of manure and 16 kg of NPK (16:10:6) for production and quality of A type cuttings had the highest yield and higher than that of the control at 95% confident level. The ratio of germination, plant height, number of leaves per plant reached the highest and higher than the control at 95% confident level when applying 70 g of NPK (16:10:6)/m².

Keywords: Cutting, fertilizer, purple Trung du tea variety, nursery

Article 9:

Study on quality of Trung du purple tea raw materials in Northern Vietnam

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Abstract

Results of monitoring, evaluating and analysis of the mechanical components; biochemical components; tea quality, in order to propose quality standards for raw materials of purple Trung du tea in Northern Vietnam showed that: The component of tea buds with 3 leaves had the ratio of buds as 2.88%; the ratio of the first leaf reached 8.50%, the ratio of the second leaf reached 21.44%; the ratio of the third leaf reached 32.05% and the ratio of stalk reached 35.14%. The grade of raw material of tea buds with the ratio of B+C type was over 42%. The biochemical components of one bud 3 leaves was recorded that the tanin content reached 28,63%; soluble substances contents reached 42.26%; anthocyanin contents reached 0.119% and chlorophyll contents reached 7.84%. Evaluation of product quality for purple Trung du tea by taste sensory testing showed that the sensory test core was 17.00 points and ranked fairly in all different growing seasons.

Keywords: Composition, tea buds, ratio, quality, standard

Article 10:

Effect of 1-methylcyclopropene concentration with low temperature on shelf life extension of postharvest red-fleshed dragon fruit (*Hylocereus polyrhizus*)

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Abstract

In this study, we investigated the effects of 1-MCP at different concentrations (0 ppb, 200 ppb, 300 ppb, 400 ppb, and 500 ppb) in combination with low temperature preservation (5⁰C) on storage duration of red-fleshed dragon fruit. The results showed that the concentration 1-MCP at 400 ppb was the most suitable for prolonging the shelf-life and remaining the quality of postharvest dragon fruit. At the same time, some quality factors were determined during storage at the same conditions (1-MCP of 400 ppb treatment; storage temperature of 5⁰C; humidity of 85-90%; 30 days storage) as follows: total sugar content: 11.61%; total acid content: 0.192%; weight loss rate: 0.80% and damage rate: 5.27%.

Keywords: Red-fleshed dragon fruit, storage, 1-MCP treatment, low temperature

Article 11:

Study on preparation of hydrogel from coir dust by irradiation method for arsenic adsorption application

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Abstract

In this study, the hydrogel materials were prepared from coir dust, acrylic acid and chitosan by gamma irradiation (Co-60) for adsorbing arsenic ion in water. The results showed that the gel fraction increased from 39 to 68%, while the water swelling degree of the hydrogel material decreased from 9.0 to 5.0 g/g when the irradiation dose increased from 4 to 12 kGy. In addition, when increasing the AAc/coir dust ratio, the gel fraction increased while the water swelling degree decreased. The gel fraction of hydrogel material increased when adding 1% chitosan. The prepared hydrogel showed an adsorption capacity for As⁵⁺ of 1.41 mg/g dry gel in 48 hours. The hydrogel prepared from coir dust has a potential application in water treatment for adsorption of arsenic ion.

Keywords: Acrylic acid, coir dust, irradiation, hydrogel, arsenic, water treatment

Article 12:

Study on technical measures for Ha thu o do (*Fallopia multiflora* (Thunb.) Haraldson) at Son Dong commune, Son Tay, Hanoi

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Abstract

The experiments were designed to evaluate the effects of growing time, planting distance and fertilizer doses on growth, development, yield and quality of *F. multiflora*. The results showed that the best growing time was in March or in October of the year; the planting distance of 40 x 30 cm and fertilizer dose for 1 ha within 2 year including 4 tons of microbial organic fertilizer + 200 kg N + 400 kg P₂O₅ + 200 kg K₂O. With all the above conditions, the yield of Ha thu o do growing in Son Dong commune, Son Tay district, Hanoi city reached

2600 - 2800 kg/ha and the content of 2,3,5,4'-Tetrahydroxystilben-2-o- β -glucosid was recorded over 2%.

Keywords: Cultivation, Ha thu o do, *Fallopia multiflora*, high quality and yield

Article 13:

Verification of DNA extraction methods for GMO detection purposes

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Abstract

This study was carried out to verify four DNA extraction methods, three in accordance with TCVN 7606: 2007 (ISO 21571: 2005) including Phenol/Chloroform, Polyvinyl-pyrrolydon (PVP) and CTAB DNA extraction methods. The fourth method was DNA extraction using Wizard kit clean-up (Promega). A total of 11 samples were extracted, including seed/particle, powder, liquid, feed and food products. Negative control (H₂O) and positive control (maize leaves) were also included. Each sample was extracted twice in each method. The results showed that the method of extracting DNA by phenol/chloroform was not suitable for the above matrix samples while method of extracting DNA by PVP was suitable for seed/particle matrix. The DNA extraction by using CTAB was suitable for pure DNA with a concentration ranging from 40.5 ng/ μ l to 184.4 ng/ μ l, the ratio of A260/280 fluorescent gained from 1.68 to 2.27. The method of extraction by using DNA clean-up kit was suitable for pure DNA with concentrations ranging from 75.6 ng/ μ l to 184.4 ng/ μ l, the A260/280 index ranging from 1.8 to 2.07. Two DNA extraction methods of using CTAB and DNA clean-up kit were recommended for testing purposes in the GMO laboratories.

Keywords: DNA extraction methods, matrix samples, concentration, quality

Article 14:

Bio-characteristics and development of potential fungus species *Paecilomyces cicadae* in controlling of Casidae damaging coffee

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Abstract

Paecilomyces cicadae is one of potential fungus species parasiting on cicada species damaging coffee in Western Highland of Vietnam. The study on Bio-characteristics and development of *Paecilomyces cicadae* was carried out from 2013 – 2015 and five indigenous strains of *Paecilomyces cicadae* (Pae1, Pae2, Pae3, Pae4, Pae5) were isolated and purified. Among them, Pae1 strain was high potential in controlling of Cicadas damaging coffee in Western Highland areas with efficacy of 87.8% in greenhouse conditions. The morphological characteristics of this fungal species were identified. The result also indicated that Pae1 strain developed well with colony diameter of 5.10 - 5.75 cm after 12 days of culturing in suitable PDA media at temperature from 20 to 25°C and at pH 6.0 - 6.5.

Keywords: *Paecilomyces cicadae*, Cicada species, coffee, efficacy, bio-characteristic

Article 15:

Isolation and evaluation of biological characteristics of bacterial endophytes from turmeric roots

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Abstract

This experiment was carried out to isolate and evaluate biological characteristics of endophytic strains from turmeric roots. 21 endophytic bacterial isolates were isolated from turmeric rhizome. All of these strains produced siderophore, IAA and solubilized phosphate. The strongest strain of TD2 was selected for evaluation of the effect of incubation time and medium pH on the IAA biosynthesis ability; effects of carbon and nitrogen sources on phosphate solubility. The TD2 strain showed the most powerful IAA synthesis after 5th day of culture (76.11 µg / ml) in the NA medium with pH 6-7. Suitable carbon and nitrogen sources for this strain exhibit phosphate solubility were D-sorbitol, peptone and NH₄⁺ and NO₃⁻ containing nitrogen sources.

Keywords: Endophytes, IAA and siderophore biosynthesis, phosphate solubility, turmeric roots

Article 16:

Testing of *Metarhizium anisopliae* fungus preparation for Cicada and longhorn beetle control

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Abstract

The project "Testing of *Metarhizium anisopliae* fungus preparation for Cicada and longhorn beetle control in Gia Lai, Vietnam" was conducted from 2010 to 2011. The results showed that *Metarhizium anisopliae* gave high effectiveness from 34.25% to 61.69% for cicada control after two years application. The highest effectiveness was recorded in treatment 3 (61.69% in 2011) after 30 days of application. *Metarhizium anisopliae* population remained in coffee plantation soil was $5.4 - 6.0 \times 10^5$ CFU/g. The effectiveness was unclear for longhorn beetle control. Furthermore, *Metarhizium anisopliae* population remained in sugar cane plantation soil was only $3.8 - 4.4 \times 10^3$ CFU/g.

Keywords: Coffee, sugarcane, cicada, longhorn beetle

Article 17:

Application of bio-product from *Bacillus subtilis* and industrial enzymes for hydrolyzing beer yeast

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Abstract

Research on the effect of industrial enzymes on hydrolysis of waste beer yeast cells showed that the suitable concentration of supplemented SEBflo-TL was 0.6% . Free amin nitrogen (FAN) content increased by 16%; total dissolved nitrogen increased by 19%; content of soluble dry matter in extract increased by 28%, reducing sugar content increased by 43%. The ratio of proteolytic enzymes Neutral PL for protein degradation was 1.2%. The FAN content increased by 38%, total dissolved nitrogen, by 24%, dry matter by 17%, and reducing sugar by 23% when adding 1.2% of proteolytic enzymes Neutral PL. The ratio of bioproduct

containing *B. subtilis* was 5% and at this ratio of bioproduct FAN, total nitrogen, dry matter, reducing sugar increased by 12%, 10%, 12%, and 14%, respectively. The bioproduct can be used for treatment of waste beer yeast to produce animal feed.

Keywords: Beer yeast, industrial enzyme, *B. subtilis* bio-product, hydrolysis

Article 18:

Effectiveness of *Tithonia diversifolia* for control of nematodes and fungi damaging coffee trees

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Abstract

Root rot and yellow leaf disease cause serious damages to coffee plants due to nematodes and fungi. Numerous studies worldwide have shown the potential of *Tithonia diversifolia* plant to control fungi and nematodes, but have not been interested in Vietnam. The result showed clearly effectiveness of *Tithonia diversifolia* powder for controlling nematodes, fungi and plant growth of coffee trees under greenhouse condition. The treatment of 20 g powder of *Tithonia diversifolia* with 1 kg soil had very high effects to control nematodes (91.75%) and *Rhizoctonia* spp. (100%) harming the coffee roots, keeping the low rate of galls and rotten roots (14.33%), and stimulating the better growth and development of coffee trees in a significant way compared to the control after 3 months of planting. Thus, *Tithonia diversifolia* powder (20 g/kg soil) was recorded to be potential for controlling nematode and fungal pathogens and produce free disease coffee seedlings.

Keywords: *Tithonia diversifolia*, nematodes, fungi, coffee

Article 19:

Effectiveness of crude extract from *Tithonia diversifolia* in resistance to nematodes and fungi damaging coffee trees

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Abstract

Root rot and yellow leaf disease cause serious damages to coffee plants due to nematodes and fungi. The result clearly showed that the effectiveness of crude extract from *T. diversifolia* against nematodes and fungi increased gradually with treating time and concentrations. The best effectiveness from crude extract treatments for killing *Meloidogyne incognita* and *Pratylenchus coffeae* was 400 ppm (85.64% and 80.40%, respectively after 48 hours of treatment). The crude extract at concentration of 400 ppm strongly inhibited the growth of *Rhizoctonia solani* (90.10%), but weakly inhibited the growth of *Fusarium oxysporum* (55.70%). This study opens up prospects for developing biological products from *Tithonia diversifolia* plants to control fungi and nematodes damaging coffee plants in Vietnam.

Keywords: *Tithonia diversifolia*, crude extract, nematodes, fungi, coffee

Article 20:

Economic efficiency of intercropping pilots on coffee gardens

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Abstract

The result of survey of 30 typical coffee growing pilots showed 11 intercropping systems with 6 intercrops (durian, avocado, pepper, macadamia, mangosteen and *Cassia Siamea*) which have functions of shading, windbreak and fruiting. The intercropping systems created an average profit of 186.36 million VND/ha nearly doubling coffee monoculture. Intercrops including durian, avocado and pepper produced a similar and high revenue (85 - 87 million VND/ha) which will be promised for crop diversification and for sustainable coffee production.

Keywords: Intercropping, sustainability, economic efficiency, coffee

Article 21:

The variation of basaltic soil fertility growing coffee in Western Highlands

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Abstract

The study results showed that soil fertility indicators were greatly improved after 25 years of coffee intensive cultivation in comparison with that after 4 years of coffee farming; especially, the contents of nutrients such as organic, total nitrogen, available phosphorus and potassium tend to be significantly improved with the increase of coffee productivity as organic content increasing 1.1%; available phosphorus > 5 mg P₂O₅/100 g of soil; available potassium > 4 mg K₂O /100 g of soil%. However, the other indicators related to soil quality tend to decrease as pH_{KCl} dropping 0.58 unit; exchangeable calcium 1.55 meq/100 g of soil (44.3%); exchangeable magnesium 1.6 meq/100 g of soil (59.3%). Balanced fertilization not only have contributed to increase yields but also to improve indicators of soil fertility such as total organic, total nitrogen, available potassium and phosphorus in the soil. Growing coffee with shade trees both control yield and improve the fertility status of the soil, and contribute to improve the economic efficiency, society and environment in coffee production in Western Highlands.

Keywords: Fertility, coffee soil, Western Highlands

Article 22:

Assessment of land suitability for arranging crops in Buon Don district, Dak Lak province

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Abstract

Agricultural production is the biggest sector in economical structure of Buon Don district, with cultivating area of 30,962.4 hectare. To have scientific basis for arranging suitable crops, the assessment of land suitability was carried out during 2014 – 2015. The land unit map (LUM) of Buon Don district was built by analyzing of climate and soil properties. The study results showed that Buon Don district had 74 LUMs, which expressed difference of soil, slopping, depth, texture, organic matter, water and drainage condition. The LUMs of Buon Don district belonged to 25 suitable types, depending on crop requirements. Type 1 was only suitable to rice, not appropriate for upland crops because of waterlogged; type 2 was suitable for upland crops, except cotton and pepper; types 3, 4, 6, 8, 9, 10, 11, 12, 13, 14 and 21 were adaptable to almost of crops; types 5, 7, 16, 17 and 18 were appropriate to annual crops except cotton, not suitable to perennial crops; types 15, 20 and 24 weree lack of water, so could not use for

growing crops which demand high irrigation water such as coffee, rice; types 19, 22 and 23 were suitable to upland crop; and type 25 was not suitable to any crop.

Keywords: Agriculture, arranging crop, land unit, major soil group, suitable type

Article 23:

The growth of high yield crossbred cattles between Laisind cows and bulls breeds: Brahman, Drought Master, Red Angus in Lam Dong province

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Abstract

By crossing between high yield bulls including Brahman, Drought Master and Red Angus with Laisind cows in Lam Dong province, the body weight of all three groups of high yield crossbreds at 6 month old was significantly higher than Laisind and reached: 124.0 kg/head; 134.0 kg/head and 137.0 kg/head while Laisind only reached 87.2 kg/head. Daily feeding 7 to 18 month old cattle with supplementation of 1,0 - 1.5 kg of concentrate food, the weight gain of Red Angus crossbred group (Red Angus x Laisind) reached highest, following was Drought Master crossbred group and the lowest was Brahman one. Although the weight gain of all three crossbred groups were higher than that of Laisind group. Fattening for 90 days, the weight gain of the three groups of high yield crossbreds was similar (801.1 to 882.2 g/head/day) and higher for Laisind group. The income of the Red Angus crossbred was highest, followed by the Drought Master crossbred and the lowest was the Brahman one.

Keywords: Cow Laisind, F1 (Brahman x Laisind), F1 (Drought Master x Laisind), F1 (Red Angus x Laisind).