

## **Article 1:**

### **Selection of hybrid maize varieties for sloping land in Anh Son district, Nghe An province**

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#### **Abstract**

The study on selection of hybrid maize varieties for sloping land in Anh Son district, Nghe An province was conducted by the Agricultural Science Institute of Northern Central Vietnam (ASINCV) during 2015 – 2016. The result showed that the highest yield over 2 years (63.46 - 64.69 quintals/ha) was recorded at VS71 hybrid maize variety with good drought tolerance and some of the major insect and diseases. The result of the demonstration of VS71 maize variety in spring crop yielded 67.25 quintals/ha with 10.44 quintals/ha higher than that of the control variety DK6919 (56.81 quintals/ha). The added profit increased by 7.7 million VND/ha.

**Keywords:** Hybrid maize, sloping land, selection

## **Article 2:**

### **Selection of potential peanut varieties for the North Central region**

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#### **Abstract**

The evaluation of 9 peanut varieties, including V79, G26, L20, TK10, R02, R03, Q1, Q3 and 1 control variety L14 showed that all studied varieties had medium growth duration (110 - 115 days) average yield from 3.45 – 4.75 tons/ha and good resistant to pests and diseases. Among studied varieties, Q2 variety had good characteristics such as Spanish plant type; average height at 35 - 40 cm; fruits were medium; seed coat color was white - purple; the ratio of two seeds was over 85%. Q2 had average growth duration from 115 - 120 days in Spring and 100 days in Autumn. The average yield of Q2 reached 4.5 - 4.7 tons/ha and was 15 - 20% higher than that of control variety L14. The weight of 100 fruits was 170 g and the

weight of 100 seeds was 68 g and the ratio of seeds was over 75%. Q2 variety was resistant to major pests and diseases and adaptable to eco-condition of the North Central region.

**Keywords:** Peanut varieties Q2, evaluation, yield, resistance

### **Article 3:**

#### **Stability of promising maize hybrid combinations over three different seasons in Phu Tho province**

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#### **Abstract**

Five hybrid combinations, including VN1, VN2, VN3, VN5 and NK67 with stable and high average yield (from 81.86 to 92.4 quintal/ha) were selected by yield stability assessment of 15 promising hybrid combinations in three seasons in Phu Tho province. These hybrid combinations could be planted in all seasons. VN7, VN12, VN13 and VN15 hybrid combinations had high average yield (from 78.3 to 83.0 quintals/ha), however, their stability index was not high, so that they are suitable in good environmental conditions (in Spring season). These initial results are important information for breeders before implementing production test.

**Keywords:** Maize, stability, good environment

### **Article 4:**

#### **Identification of planting density and fertilizer doses for winter maize production by applying minimum tillage and straw mulching in Red River Delta**

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## **Abstract**

Planting density and fertilizer doses play an important role in increase of yield and efficiency of Winter maize production in Red River Delta. This study was conducted in Hanoi and Vinh Phuc in Winter 2015 and Winter 2016. The results showed that planting density of 60,000 plants per ha (70 x 24 cm) and fertilizer doses of (180 kg N - 80 kg P<sub>2</sub>O<sub>5</sub> - 100 kg K<sub>2</sub>O/ha) gave the highest yield and efficiency for maize production in Red River Delta.

**Keywords:** Winter maize, planting density, fertilizer dose, minimum tillage, Red River Delta

## **Article 5:**

### **Effect of cassava planting density on growth, development, yield and starch content in Dak Nong province**

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## **Abstract**

Research aims to identify the best planting density for cassava growth, development with high yield and good quality. The experiments of cassava planting density included 5 treatments: CT1: 8,333 plants/ha; CT2 (control): 10,000 plants/ha; CT3: 12,500 plants/ha; CT4: 14,000 plants/ha; CT5: 15,625 plants/ha; the experiments were conducted in two years (2014 and 2015) in Krong No, Dak Song and Dak Glong districts. Results indicated that the most appropriate planting density was 12,500 plants/ha and obtained the superior yield of 28.18 tons/ha, increased by 14% as compared to that of the control and had high adaptation and yield stability; starch content reached 26.3%. In addition, the planting density of 14,000 plants/ha could be suitable for cassava monoculture in poor and slope soils, and the yield was recorded at 27.38 tons/ha.

**Keywords:** Krong No district, Dak Song district, Dak Glong district, Dak Nong province, cassava, planting density

## **Article 6:**

### **Effect of mulching materials on growth and yield of new sesame variety VD11 in Summer – Autumn crop season in Nghe An province**

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### **Abstract**

The different mulching materials lowered temperature and increased soil moisture in Summer – Autumn crop season in Nghe An province. The temperature decreased the most when mulching by the black nylon, followed by the white nylon and by the groundnut plants. By using mulch materials, the growth duration of sesame variety VD11 was prolonged; the plant height and the number of node/stems were increased; the yield increased by 26.7 to 32.4% on sandy soil and by 27.7 to 33.0% on light soil compared to that of the control and the yield decreased by following range of black nylon > white nylon > groundnut plants. The most economical efficiency was observed by mulching black nylon with an increase in net profit of 1.56 times, followed by white nylon with 1.45 times and groundnut plants with 1.42 times compared to the control.

**Keywords:** Mulching materials, yield, profit, sesame, Summer – Autumn crop season, Nghe An

### **Article 7:**

#### **Effects of phosphate doses on yield and economic efficiency of Dien Bien red groundnut variety in Tuan Giao district, Dien Bien province**

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### **Abstract**

Study on phosphate fertilizer in Tuan Giao district, Dien Bien Province showed that different phosphate doses affected significantly the growth of Dien Bien's red groundnut variety. The applying dose of 75 kg P<sub>2</sub>O<sub>5</sub>/ha was most suitable for the growth and development. The increase of P fertilizer doses in the range of 30 - 60 kg P<sub>2</sub>O<sub>5</sub>/ha positively correlated with the yield components and reached a maximum yield of 2.9 tons/ha in 2016 and 3.27 tons/ha in 2017 when applying 60 kg P<sub>2</sub>O<sub>5</sub>/ha. The highest net profit was obtained in comparison with the control (equivalent to 25 million VND/ha and 2.6 times in 2016; VND 36.8 million/ha and 2.8 times in 2017) when applying 1 ton of Song Gianh micro-organic fertilizer + 300 kg of lime powder + 30 kg N + 60 kg of P<sub>2</sub>O<sub>5</sub> + 60 kg K<sub>2</sub>O.

**Keywords:** Red groundnut, phosphorus doses, Tuan Giao district, Dien Bien province

## **Article 8:**

### **Effect of nano-micronutrient foliar-fertilizers on yield of soybean grown in the Southeast and Mekong Delta regions**

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#### **Abstract**

The experiment study on effect of nano- micronutrient foliar-fertilizers on yield of soybean was conducted in the Southeast (Dong Nai) in Summer-Autumn 2017 and in the Mekong Delta (Vinh Long) in Spring-Summer 2017. Eleven treatments from 9 different types of nano- micronutrient foliar-fertilizers and 2 controls were designed in randomized complete block (RCBD) with 3 replications. In Dong Nai province, DT A213, DT A312 and DT A313 nano-fertilizers foliar had the highest yields (23.2 quintals/ha, 22.6 quintals/ha, 23.6 quintals/ha, respectively) and higher than that of Rong bien control by 10%, 7%; 12% and by 19%, 16%; 21% in comparison with water control. In Vinh Long province, DT A212, DT A213, DT A313 nano-fertilizers foliar spray have the highest yield (26.07 quintals/ha, 25.97 quintals/ha, 25.21 quintals/ha, respectively) and higher than that of Rong bien control by 10%; 9%; 6% and by 26%; 25%; 21% in comparison with water control. The treatment of DT A213 and DT A313 was a promising one which can be applied to Dong Nai and Mekong Delta provinces or other locations with similar conditions.

**Keywords:** Nano fertilizer, nano-micronutrient fertilizers foliar, soybean foliar

## **Article 9:**

### **Study on foliar fertilizer effect and Thien Nong GA<sub>3</sub> on the quality of Hong Quang Tien pomelo fruit**

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#### **Abstract**

Application of additional foliar fertilizer Yogen 16 (5 -7 -44) or another foliar fertilizer Dau Trau 902 (17-21-21) to the pomelo variety Hong Quang Tien after 7 – 8 year old harvesting and spraying 3 times in August with 10 days interval could increase Brix index to 10.34 -

10.47% with 0.69-0.82% higher than that of the control (9.65%). Using GA<sub>3</sub> Thien nong product with concentration of 90 – 110 ppm at 3 growth stages (budding, full of flower, flower finishing) could reduce 47.18-55.13% of seed number and 50.52 - 58.01% seed weight in comparison to that of the control.

**Keywords:** Hong Quang Tien pomelo, Thien Nong GA<sub>3</sub>, foliar fertilizer

### **Article 10:**

#### **Results on building demonstration pilot of intensive cultivation of high yielding groundnut, cassava and maize varieties in Quang Tri province from 2016 to 2017**

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#### **Abstract**

The project “Agricultural technology development and dissemination in Lao Cai and Quang Tri under KOICA Happiness Programs” in the period of 2016 - 2018 was carried out by ASINCV in Quang Tri province from 2016 to 2017. The project selected potential crop and built demonstration pilot of intensive cultivation of high yielding for groundnut, cassava and maize in Cam Lo and Vinh Linh districts of Quang Tri province. The results showed that the yield of crop varieties in the demonstration pilot was higher than that in the traditional cultivation farm. The groundnut intensive cultivation model yielded from 3.42 to 3.74 tons per hectare (increased by 53.98 - 68.02%), profit increased by 21.05 - 21.80 million VND/ha; the yield of cassava intercropping with mung bean reached 36.8 tons/ha (increased by 26.03%), adding profit increased by 8.4473 million VND/ha; the yield of maize was 6.64 - 6.74 tons per hectare (increased by 69.24 to 71.64%), and the profit increased by 11-12 million VND/ha.

**Keywords:** Demonstration pilot, Quang Tri, groundnut, cassava and maize varieties, intensive cultivation

### **Article 11:**

#### **Building of demonstration pilot for intensive cultivation of peanut by applying mechanization in Nghe An**

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### **Abstract**

Applying mechanization (Seedling equipment MGL-1, harvesting machine MTL-1000 and peanut seed separator MBL-1000) into some stages of peanut production combined with advance techniques made the yield of peanut variety (L26) reaching 4270 kg/ha, increased by 16.9% to 28.2% in comparison to that of the control. The total income was recorded at 50.18 million VND/ha, increased by 70% in comparison to that of the same variety L26 and by 2.5 times compared with local varieties when applying traditional cultivation technique. Application of mechanization in peanut production could decrease labor cost in more than 30% and free labour sources, contributing to changes of farming habit toward big farm, massive production and motivating the re-structure of agriculture in future

**Keywords:** Mechanization, intensive cultivation, peanut, Nghe An province

### **Article 12:**

#### **Evaluation of hybrid maize combinations in Nghe An province**

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### **Abstract**

Eight promising hybrid maize combinations with average yield of 11.0 - 11.4 tons/ha and their average yield was higher than that of the controls by 3.2 tons/ha were selected. These hybrid maize varieties were resistant to main pests and diseases, their growth duration was similar to that of the controls with 105 - 109 days and they were suitable for Nghe An cultivation condition.

**Keywords:** Hybrid maize combinations, evaluation, yield, Nghe An province

### **Article 13:**

#### **Identification of crops for intercropping with sugarcane in sandy soil in Nghia Dan district, Nghe An province**

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#### **Abstract**

The experiment on various crops intercropping with sugarcane on sandy soil in Nghia Dan district, Nghe An province was carried out by Phu Quy Industrial and Fruit trees Research Center during the period of 2016 – 2017. The result showed that crops including groundnut varieties L26, L23; soybean variety DT26 and mung bean variety DX14 grew and developed well when intercropping with sugarcane variety ROC22. The average yield of intercropping varieties varied from 7.5 - 17.33 quintals/ha and the yield of sugarcane was 68.09 - 75.5 tons/ha. The farmer income increased from 8.08 mill. VND to 31.54 mill. VND per ha compared to sugarcane monocropping. In addition, intercropping crops also provide supplementary nutrients and improve soil quality (green manure, protein).

**Keywords:** Intercropped sugarcane, raw sugarcane, sandy soil, Nghe An province

### **Article 14:**

#### **Evaluation of growth and development characteristics of introduced orange variety V2 in Nam Dong district, Thua Thien - Hue province**

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#### **Abstract**

Orange has been considered as a valuable crop in Nam Dong district, Thua Thien Hue province, but degraded in terms of low yield and quality because of pest, diseases and unsuitably applied technologies. To improve the growing situation, newly screened orange cultivar namely V2 was introduced and cultivated in Nam Dong district under the project of establishment of orange intensive cultivation pilot from 2011. The result was recorded after 5

years of project implementation showed that V2 orange variety had good growth presented by proper tree height (3.2 - 3.5 m), stem diameter (7.3 – 7.6 cm) and reasonable canopy (2.6 - 3.1 m in diameter). Its yield ranged from 10.75 - 12.5 tons/ha, equivalent to that as grown in Nghe An, Hanoi, Phu Tho...The studied result provides a scientific basis for evaluation of V2 adaptability to climate and soil condition of Nam Dong.

**Keywords:** V2 orange, evaluation, characteristics, growth, development, Nam Dong, Thua Thien – Hue

### **Article 15:**

#### **Study on pesticide utilization for maize production in Mai Son district, Son La province in 2015 and 2016**

Nguyen Van Tao<sup>1</sup>, Le Quoc Thanh<sup>1</sup>, Dang Ngoc Ha<sup>2</sup>,  
Luong VanVang<sup>2</sup>, Vu Ngoc Quy<sup>2\*</sup>, Le Van Vuong<sup>2</sup>,  
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### **Abstract**

The results of survey on maize cultivating area in Maison district, Sonla province, Viet Nam in 2015 và 2016 showed the presence of full target pests on maize including insect pest, weeds and diseases. The chemicals containing *Atrazin* as active ingredient was the most effective herbicide to control dicot weeds after two growing seasons of pesticide and herbicide testing. The herbicide that contain *Simazine* as active ingredient was the most effective to control monocot weeds. Among four active ingredients including *Ethyl Chlorpyrifos*, *Acetamid*, *Abamectin* and *Fenitrothion*, the *Ethyl Chlorpyrifos* was not as much effective as the others. Among the acive ingredient group *Cholorothanotil*, *Carbendazim* and *Thiram*, *Cholorothanotil* was more effective than others.

**Keywords:** Disease herbicide, pest, insect, insecticides, maize, weed

## **Article 16:**

### **Survey on culture conditions of recombinant bacteria *E. coli* BL21- pET22b(+)-*gelE* synthesizing gelatinase**

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#### **Abstract**

The investigation of carbon, nitrogen sources, temperature, pH and culture time was conducted to evaluate the effects of culture conditions on growth and gelatinase biosynthesis of *E. coli* BL21- pET22b(+)-*gelE* strain. The results showed that: Nitrogen, carbon sources supplemented to the recombinant breeding medium were *E. coli* BL21- pET22b(+)-*gelE*, yeast extract or peptone 1% + glucose 1%. Simultaneously, the suitable culture condition for this recombinant strain was at 30 ÷ 37 °C and pH = 7 ÷ 8. The appropriate culture time for recombinant bacteria *E. coli* BL21- pET22b(+)-*gelE* was in 24 hours.

**Keywords:** Gelatinase, recombinat bacteria, *E. coli*

## **Article 17:**

### **Determination of culture conditions for *Streptomyces variegatus* NN1 to improve anti-fungal effect on *Aspergillus flavus* causing disease on Citrus fruits**

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#### **Abstract**

This study aimed to determine appropriate culture conditions for *Streptomyces variegatus* NN1 to improve antifungal effect on *Aspergillus flavus* causing disease on citrus fruits. The experiments were designed and focused on evaluation of producing antibiotics ability of *Streptomyces variegatus* NN1 under different fermentation conditions. The results showed that the optimal environment for fermentation was A4-H medium, pH 7 - 8; the best temperature was at 30 - 35°C and the ratio of culture volume/vessel volume was 10%. Then

the culture medium was shaken with speed of 200 rpm. The time for *Streptomyces variegatus* NN1 producing the most antifungal agents was after 5 shacking days. After using above conditions, the inhibition of NN1 strain to *A. flavus* was tested and it showed a strong antifungal activity.

**Key words:** *Aspergillus flavus*, *Streptomyces variegatus*, Actinomyces

### **Article 18:**

#### **Effect of endophytic bacteria on purple yam yield on acid sulfate soils**

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#### **Abstract**

Pot experiment and field experiment were conducted in Winter - Spring crop season and Summer - Autumn crop season of 2015 to evaluate effect of endophytic strains combined with nitrogen fertilizer doses on the yield of purple yams grown on acid sulfate soils in Hau Giang. Both experiments were arranged in a completely randomized block consisting of two factors with 4 replications. Factor (A) included nitrogen fertilizer doses (0 N, 25 N, 50 N, 75 N) and factor (B) was bacterial strains (non-bacterial, Azospirillum X1, Azospirillum X2). Results showed that Azospirillum X2 most effectively increased the diameter of purple yam tuber and yield. The treatment of 75 kg N ha<sup>-1</sup> combined with Azospirillum X2 got higher yield than that of the treatment of 75 kg N ha<sup>-1</sup> without bacteria.

**Keywords:** Acid sulfate soils, endophytic bacteria, nitrogen-fixing capacity (NFC), purple yam

### **Article 19:**

#### **Identification and characterization of a green mold causing disease in Lingzhi mushroom**

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## **Abstract**

Green mold is a disease in both the mycelium stage and the cap of *Ganoderma lucidum*. Initially, 6 mold strains from 40 infected Lingzhi mushroom were isolated. Through artificial infection or re-infection, LC1 strain was identified as the causative pathogen of green mold disease on the Lingzhi mushroom. Study on the biological characteristics of the LC1 showed that LC1 strain was capable of releasing chitinase. Colonies were green, no concentric cuts, aerial hyphae, small size ranged from 0.3 - 1.5 cm. The hyphae of LC1 had cross-sectional partition, bearing conidia (globose in structure, smooth outer surface, green, and spread easily in the air) and asexual reproduction by conidiophore. Optimal temperature for growth of LC1 strain was 25 - 30°C and optimal pH was 5.5 - 6.5. LC1 strain was identified to belong to *Penicillium citrinum* species, named *Penicillium citrinum* by analyzing biological and molecular biology characteristics.

**Keywords:** Green mold, *Ganoderma lucidum*, *Penicillium citrinum*, Lingzhi mushroom

## **Article 20:**

### **Evaluation of basal soil fertility for orange growing area in Phu Quy district, Nghe An province**

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## **Abstract**

This study focused on the actual soil fertility of the citrus growing area in Minh Hop commune, Quy Hop district and key cooperatives (Nghi Long, Nghia Hong, Nghia Hieu and Nghia Son communes) in Nghia Dan district having large, intensive growing areas in Phu Quy. The results showed that  $\text{pH}_{\text{KCl}}$  was less than 5.5 and the soil was almost acidic until very acidic while  $\text{pH}_{\text{KCl}}$  is suitable for citrus varying from 5.5 - 6. The total Organic Matter content (OM) in the soils of the areas was quite high with  $\text{OM} > 3.45\%$  and it was suitable for citrus. In the studied areas, the total nitrogen was low to medium (0.09 - 0.22%); total potassium was poor (0.03 - 0.77%) and easily assimilated potassium was also poor (3.44 - 9.98 mg/100 g soil); the total phosphate was almost high (0.1 - 0.29%) while the easily assimilated phosphate was low (0.7 - 14.63 mg/100 g soil).  $\text{Ca}^{2+}$ ,  $\text{Mg}^{2+}$  were insufficient in most of the studied soil samples.

**Keywords:** Soil fertility, citrus growing soil, Phu Quy district - Nghe An province

## **Article 21:**

### **Comparison of antiseptics in preventing silkworm from Milky and Septicemia diseases in Vietnam**

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#### **Abstract**

This study is the first comparison of four kinds of antiseptics including Calcium Hypochlorid, formalin, Dichlo Isocyanuric Acide, Trichlo Isocyanuric Acide in preventing silkworm from Hemophilia and Septicemia diseases in Vietnam. The results showed that, at the same dose (2%), Trichlo Isocyanuric Acide (TCCA) gave the highest effect ( $\alpha < 0.05$ ), followed by formalin, Calcium Hypochlorid and Dichlo Isocyanuric Acide (DCCA). In TCCA treatment, diseases decreased significantly to 7.63% and in Formalin 2% was 8.74%. The disease ratio was similar when applying DCCA 2% and Calcium Hypochlorid 2% (8.67% and 8.78%, respectively). The highest ratio of diseases (19.69%) was observed at the control treatment (in which the ratio of *Bombyxmori Cytoplasmic Polyhydrosis Virus* was 10.67, the ratio of Hemophilia was 5.67%, and the ratio of other diseases was 3.35%) and the incubation ratio was 9.67%. In addition, this group could also increase cocoon shell up to 16.44%, significantly higher than that of the others. The both experiments show the similar result. Thus, it is recommended to use TCCA for replacing other conventional chemicals in prevention of silkworm diseases.

**Keywords:** Trichlo Isocyanuric Acide (TCCA), Silkworm, Milky and Septicemia diseases

## **Article 22:**

### **Effects of planting depth on growth and yield of turmeric plants in Thanh Hoa and Bac Giang provinces**

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#### **Abstract**

The promising turmeric variety N8 was selected by Plant Resources Center and was recognized by the Ministry of Agriculture and Rural Development (MARD) for trial production in 2017. Based on the completion of integrated farming techniques for the N8 variety, the experiment on the planting depth from 10 to 30 cm was conducted in Bac Giang

and Thanh Hoa provinces. The results showed that the planting depth at 20 cm was the most suitable for developing of branches, leaves and roots. The drought tolerance of N8 varieties was highest (point 1) when putting of seedling at the depth from 20 to 30 cm. When the depth increased from 10 cm to 20 cm, the number and the weight of roots, and the actual yield increased respectively (corresponding to 1.3 - 2.6 roots/cluster, 621 - 824 g/cluster 24.6 - 36.4 tons/ha) in Bac Giang) and (from 1.2-2.5 roots/cluster, 639,4 - 815,7g/cluster, and the actual yield from 26.4 - 35.0 ton/ha) in Thanh Hoa.

**Keywords:** Depth, cuttings, turmeric, yield, Bac Giang province, Thanh Hoa province

### **Article 23:**

#### **Evaluation and field trial of soybean varieties in Mozambique**

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#### **Abstract**

A soybean collection of 7 Vietnamese and 8 Mozambician varieties was evaluated and tested in Zambezia province of Mozambique during 2015 – 2016. Three Vietnamese promising varieties namely DT22, DT26, DT30 having short growth duration (84 – 88 days), high yield (1.86 – 2.3 tons/ha), white flower, anti-lodging (at score of 1 – 2); resistant to rust disease with grade of 1-2/9; powdery mildew with grade of 1/9 and 2 Mozambician local varieties namely H16, TGX1740 with high yield, suitable for growing in dry season were indentified. The result of testing pilot of 4 Vietnamese soybean varieties showed that 2 varieties such as DT30 and DT26 had high yield of 1.93 and 2.07, respectively. These 2 varieties need to be tested further for production release.

**Keywords:** Soybean varieties, field trial, Mozambique