## PRESENT STATUS OF VEGETABLE PRODUCTION IN VIETNAM

#### Assoc. Prof. Nguyen Quoc Hung Fruit and Vegetable Research Institute





## Most of natural regions are mountainous



#### Agriculture's contribution in 2015 gross domestic product (GDP)



#### Share of Agriculture (including forestry and fishery) in GDP tends to decline.

National Annual Report 2015

## **Crop production 2015**

		Growing area (million ha)		Yield (ton/ha)	(m	Production nillion tons)
Rice	7.80	(+0.015)	5.78	(+0.2)	45.20	(+0.3)
Maize	1.10	(-0.08)	4.60	(N/A)	5.10	(-0.09)
Cassava	0.55	(0.00)	0.19	(N/A)	10.40	(N/A)
Fruits	0.82	(N/A)	Var	ied	8.20	(N/A)

Compared to 2014; N/A-not available

MARD Annual Report 2015

## **Industrial crop production 2015**

	Growing area (million ha)	Production (million tons)
Теа	0.132	1.000
Coffee	0.640	1.420
Rubber	0.970	0.980
Black pepper	0.100	0.165
Cashew	0.300	0.400

MARD Annual Report 2015

## **Composition of agricultural export in 2016**



Commodities reaching export value greater than **US\$1 billion** 

Coffee (3.36)

Cashew nut (2.84)

Vegetables & fruits (2.4)

**Rice (2.2)** 

**Rubber (1.67)** 

**Black pepper (1.42)** 

Cassava

Wooden products 6.91

Pork (1)

Shrimp

MARD Annual Report 2016

#### **II. PRESENT STATUS OF VEGETABLE PRODUCTION**

- Northern mountain and middle land: Tomato, cabbage, bean, chayote, leave vegetable.
- **Red river delta**: Tomato, pepper, cabbage, cauliflower, carrot, Kohlrabi, pakchoi, mustard...
- **Central highland**: Tomato, cabbage, cauliflower, potato, chinese cabbage, pepper, carrot
- Mekong river delta: cucumber, pumpkin, watermelon, bitter gourd, Kang kong.



### **Vegetable production in VN 2010-2014**

Year	Area (1000 ha)	Yield (ton/ha)	Production (1000 ton)
2010	782.405	16.57	12,967
2011	805.619	16.65	13,416
2012	829.895	16.86	13,992
2013	846.300	17.27	14,623
2014	881.000	17.50	15,419

## Major vegetable commodity production

- Red River Delta: 166,000 ha
- Northern midlands and mountainous: 103,000 ha
- Lam Dong province: 20,000 ha
- Ho Chi Minh City and neighboring:100,000 ha
- Mekong River Delta: 222,000ha

# Characteristics of vege. production in VN

- Household production with small scale
- Two main vegetable areas:

Intensive areas: peri-urban/industrial zones, high lands

Areas: rotation with rice crops

- Good infrastructure, high technical models in large cities and high land areas.
- High rate of hybrid seed application (>65%). Most hybrid seeds are imported



## Main vegetable crops in Vietnam

- Solanaceae: tomato, chili, eggplant...
- *Cucurbitaceae*: cucumber, pumpkin, watermelon, bitter gourd...
- Brassicaceae: Cabbage, Kohlrabi, pakchoi, mustard...
- Fabaceae: french bean, yard long bean
- Convulvulaceae: Kang kong...







## **Growing seasons**

- The Central and South parts of Vietnam
  - High temperature
  - Grow almost year round
- The North part of Vietnam
  - Two main seasons: hot and cold
  - Grow in winter-spring season and spring-summer season.

## **Off season vegetable production**

- Grow vegetables in regions with micro-climate suitable for specific vegetable species production (Da Lat, Sa Pa, Moc Chau)
- Grow grafted vegetable seedlings (tomato, watermelon), or grow heat tolerance varieties
- Apply phytohormones to increase fruit setting rate
- Grow vegetables in low net tunnels or shelters

## Safe vegetable production

According to MARD (2015), the safe vegetable growing area accounted around 10,000 ha.

The safe vegetable growing area got VietGAP Certification accounted for 2,897 ha.



## **Vegetable Seed/Seedling Production**

- Most hybrid seed introduced by foreign companies
- Northern provinces: seed sowing in the field
- Southern provinces:
  - + Mostly seedlings on germination trays
  - + Tomato: 100 % grafted plants





## 15/09/2015

Statistics of

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## **High-tech vegetable production in VN**

- Vegetables of high-tech production: tomato, sweet pepper, cucumber, musk melon, lettuce.

- Regions of hich-tech production: Da Lat - Lam Dong province; Ho Chi Minh City, Ha Noi City.







## 15/09/2015

## **Characteristics of vegetable market**

#### **Domestic market**

- Most farmers sell their products by themselves
- Abundant supply ways:
  fresh market, street
  vendor, supermarket,
  shop

#### Export market

- Horticultural export value is increasing
- Vegetable value is 35 –
  48% of horticultural export value
- Market: China, Korea, Japan

15/09/2015

III

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## Opportunities and challenges to the vegetable production

#### **Opportunities**

- Traditional production with experience
- High production efficiency
- Diversed natural conditions, suitable for various vegetable crops:
  - Winter season in Red River Delta: have comparative advantages in comparison with other vegetable production countries in ASIAN
  - Year-round production in Da Lat, Moc Chau, Sapa...
- Expanding and more stable market

#### Challenges

- Small household farm land area, difficult for application of technical advances and large commodity production.
- Low yield but high loss (20-50%)
- Limited research on breeding, dependent on introduced cultivars which accounts to 80% of production
- Poor use of comparative advantages for export (in Red River Delta and Lam Dong province)
- Underdeveloped infrastructure for production, processing and postharvest
- High requirements and integration of the domestic and export market, challenges of quality and safety

## **Vegetable development orientation towards 2020**

Regions	Production (2010)			Planning (2020)			
	Area	Yield	Production	Area	Yield	Production	
Total	780	166	12,935	1,200	172	20,640	
Red River Delta	166	203	3378	160	220	3520	
Northern midlands and	103	124	1287	180	130	2340	
mountainous North Central Coast	84	108	905	150	120	1800	
South Central Coast	65	136	887	130	150	1950	
Central Highland	78	220	1726	150	230	3450	
Eastern South	61	152	932	80	160	1280	
Mekong River Delta	222	172	3822	350	180	6300	

## **Vegetable research structure in Vietnam**

**1. Research Institutes:** under MARD and Vietnam Academy of Agricultural Sciences

- Research on breeding and seed production
- Cultural techniques (incl. plant protection)
- Postharvest technologies
- Economics and marketing
- **2. Universities and colleges**: VNUA, Thai Nguyen University, Can Tho University, National University of Science...

Cultural technologies and cropping systems

#### 3. Enterprises:

Breeding, seed production and supply

## **Major research aspects**

## Breeding

- Breeding and selection of major vegetable crops (F1): Solanaceae, Cucurbitaceae, Brassicaceae
- Applying biotechnology into breeding (molvecular markers, pollen culture, embryo rescue, gene transfer...)
- ➤Collecting and restoring local and indigenous varieties
- ➢ Production technologies of hybrid and pure seed

## **Intensive cultural techniques**

- Establising safe vegetable production protocols by each ecozone
- VietGAP, Basic GAP vegetable production
- Applying high-tech in vegetable production
- Off-season vegetable production

## **III. SOME OUTSTANDING ACHIEVEMENTS ON RESEARCH & DEVELOPMENT FOR VEGETABLE**

#### **NEW VARIETIES:**

#### Tomato variety: FM29

- Crop cycle: 140-160 days
- Most suitable planting time: Sep-Nov.
- Yield: 50 tons/ha
- Virus and phythophthora resistant variety.

A.A.S. Member

IGHIÊN CỨU RAU QUA

#### Tomato variety: HPT10

- ✓ Crop cycle: 110-120 days
- Most suitable planting season: Fall-Winter and Spring-Summer.

I.A.A.S. Member

ÊN NGHIÊN CỨU RAU QUA

- ✓ Yield: 60-65 tons/ha/year
- $\checkmark$  Good resistance to diseases.



### Hot pepper variety: HB9

- ✓ Crop cycle: 110-120 days
- Most suitable planting season: Fall-Winter and Spring-Summer.
- ✓ Yield: 20-25 tons/ha (30-35 tons/ha with intensive cropping)

I.A.A.S. Member

ÊN NGHIÊN CỨU RAU QUA

- Anthracnose resistance
- Suitable for processing


# Hot pepper variety: GL1-1

Crop cycle: 120-140 days

Most suitable planting season: Fall-Winter and Spring-Summer. Yield: 20-25 tons/ha (30-35 tons/ha with intensive cropping) Suitable for processing



## Cucumber variety: CV29

- ✓ Crop cycle: 80-90 days
- Fruit size: (3.5-4) x (25-35) cm
- ✓ Yield: 40 tons/ha (two harvests)
- Downy mildew and and powdery mildew resistant
- Suitable for both fresh consumption and salting

I.A.A.S. Member

ÊN NGHIÊN CỨU RAU QUA

## **Cucumber variety GL1-2**

- Crop cycle: 80-85 days.
- Yield: 50-60 tons/ha.
- Fuit size: 18-20 cm length x 4.0-4.2 cm diameter.
- Most suitable climate arear and planting season: Winter and Spring-Summer.

V.A.A.S. Member



# Bitter gourd MĐ1

- Yield: 50-55 tons/ha (springsummer season), 30-40 tons/ha (fall-winter season).
- Fruit size (18-20 cm in length x 3.5-4.0 in diameter), light green color skin.
- Good quality, mild bitter.
- Suitable to spring-summer and fall-winter seasons in the North of Vietnam.
- Downy mildew and powdery mildew resistant.

V.A.A.S. Member

VIÊN NGHIÊN CỨU RAU QUẢ



# **Breeding Tomato Resistant to Diseases**

- Objectives: to breed tomato hybrids carrying multiple genes resistant to diseases and adoptable to commercial production
- Approaches: Conventional and Marker assisted selection
- Target genes: *Ty* genes (governing *Tomato Yellow Leaf Curl Virus*), Ph genes (governing *Late blight*)

### Late blight caused by *Phytophthora infestant*



#### **Marker Assisted Selection for Late Blight Resistance**



Selection individual plants carrying homozygous gene *Ph3* in F2 population

#### **Tomato lines resistant toTYLCV**



#### Marker assisted selection for genes Ty1,Ty3

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#### Agarose gel image used Ty3 marker in selection of the F2 population



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# Agarose gel image used Ty1 marker in selection of the F2 population



# **CULTIVATION TECHNIQUES**

V.A.A.S. Member

IÊN NGHIÊN CỨU RAU QUA

- Stating tomato on eggplant rootstock technique
- ✓ Flooding tolerance
- Resistance to Bacterial wilt, phytophthora, late blight, nematode.
- Yield: 15-20 tons/ha higher than that of non-grafted

# Hydroponics Vegetables (NFT) Technique





# Hydroponics Vegetables (NFT) Technique

## Safe vegetable production technique in protected areas





#### Safe vegetable production technique in open areas









# **IV. SOME RESULTS OF JAPAN MAFF PROJECT**

**Selection** of tropically – adapted lines of vegetable to improve productivity of vegetable value chain in Southeast Asia

### The bitter gourd line/varietal lists were evaluated // in autumn - winter season 2016 in FAVRI

Sr.	Conde No.	Origin	Remark
1	AVBG 1301	AVRDC	Line
2	AVBG 1323	AVRDC	Line
3	AVBG 1324	AVRDC	Line
4	AVBG 1601	AVRDC	F1
5	VL	FAVRI	Line
6	Hybrid D	AVRDC	F1
7	Hybrid E	AVRDC	F1
8	Hybrid H	AVRDC	F1
9	Hybrid I	AVRDC	F1
10	VA No.1 (check)	Viet A Seed Co.	F1

### The pumpkin line/varietal lists were evaluated in autumn - winter season 2016 in FAVRI

Sr.	Conde No.	Origin	Mark
1	AVPU 1502	AVRDC	Line
2	AVPU 1504	AVRDC	Line (Multiple virus resistant)
3	FAVRI 3	FAVRI	Line
4	Bi hat dau	Vietnam	F1
5	TN8880 (check)	Vietnam	F1

# The tomato line/varietal lists were evaluated

Sr.	Conde No.	Name	Local Name	Origin	Note
1	AVTO1303	CLN3447G		AVRDC	Bvr, Ty2, Ty1/Ty3, Ty5
2	AVTO1306	CLN3451D		AVRDC	Bvr, Ty1/Ty3
3	AVTO1409	CLN3641A		AVRDC	Ty2
4	AVTO1424	CLN3682C		AVRDC	Bvr, Ty2, Ty1/Ty3. Ph3
5	AVTO0301	CLN2498D		AVRDC	Bvr, Ty2
6	AVTO9708	Tanya		AVRDC	12
7	AVTO1418	CLN3669A		AVRDC	Ту2, Ту3
8	AVTO1420	CLN3670b		AVRDC	Ty2, Ty3, Sm
9	AVTO1314	CLN3212C		AVRDC	Bvr, Ty5, Sm
10	AVTO1502	CLN3252J		AVRDC	Ty1/Ty3, Sm
11	AVTO0922	CLN3024A		AVRDC	Bvr, Ty2
12	AVTO1219	CLN3241H-27		AVRDC	Bvr, Ty2, Ty3, Ph2, Ph3, I2, Sm

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### The pepper line/varietal lists were evaluated

Var.	Entry code Local Name		Origin	Note
1	AVPP9703	Line	AVRDC	Trial with 3 replication
2	AVPP9813	Line	AVRDC	
3	AVPP0303	Line	AVRDC	
4	AVPP0707	Line	AVRDC	
5	AVPP1111	Line	AVRDC	
6	V1037808	Line	Srilanca	
7	AVPP1324	Line	AVRDC	
8	AVPP1346	Line	AVRDC	
9	AVPP1330	Line	AVRDC	
10	AVPP1339	Line	AVRDC	
11	AVPP9602	Line	AVRDC	
12	AVPP1240	Line	AVRDC	Only with 4 <sup>th</sup> rep.
13	AVPP1241	Line	AVRDC	
14	VI046805	Line	Peru	

#### **BITTER GOUL** Z





VIỆN NGHIÊN CỨU RAU QUẢ DỰ ÁN RAU NHẠT BẢN - AVRDC (MAFF).

Chọn lọc các dòng/giống mướp đắng phù hợp với điều kiện nhiệt đới nhằm cải thiện sản lượng trong chuỗi giá trị rau của vùng Đông Nam châu Á

Selection of tropically-adapted lines of bitter gourd to improve productivity of the vegetable value chain in Southeast Asia (Japan MAFF)

Số mẫu giống/Variety: 10

Ngày gieo/Sowing date: 17 September, 2016

Ngay trong/Transplanting date: 27 September, 2016

Số lần nhắc/Replications: 4

Cán bộ thực hiện/Responsibility: Ngo Thi Hanh - Phạm Thi Minh Hue

# 15/11/2016 07:05

#### Diseases damage of thirteen bitter gourd lines/varieties in Autumn - Winter season 2015 at 72 days after transplanting

No.	Line/Variety	Powdery mildew (mark)	Downy mildew (mark)	Cercospara (mark)	Luteovirus (mark)	Disease reaction
1	AVBG 1301	1	0	0	0	High Resistance
2	AVBG 1323	2	0	0	1	Moderate Resistance
3	AVBG 1324	2	0	0	1	Moderate Resistance
4	AVBG 1601	2	0	0	1	High Resistance
5	VL	3	0	0	2	Moderate Resistance PM and Luteovirus
6	D	3	0	0	2	Moderate Resistance PM and Luteovirus
7	Е	2	0	0	2	Moderate Resistance PM and Luteovirus
8	Н	2	0	0	2	Moderate Resistance PM and Luteovirus
9	Ι	2	0	0	2	Moderate Resistance PM and Luteovirus
10	VA.N0-1 (check)	4	0	2	3	High Susceptible to PM

### AVBG 1301 - Promising bitter gourd line in Winter season 2016 at 80 DAT

### **Spray pesticides**

#### No spray



#### AVBG 1601 – Promising hybrid bitter gourd variety in winter season 2016 at 80 DAT

**Spray pesticides** 

No spray pesticides



# PUMPKIN



A MARKAN MARKAN

Chọn lọc các dòng/giống bí ngô phù hợp với điều kiện nhiệt đới nhằm cải thiện sản lượng trong chuỗi giá trị rau của vùng Đông Nam châu Á Selestion of tropically-adapted lines of pumpkin to improve productivity of the vegetable value chân in Southeast Asia (Japan MAFF)

Nghy ginokowany, 20 Nghy ginokowang data: 16 September, 2016 Ngh ring Irangdaning data: 26 September, 2016 Si lan hale Repletations: 4 Can by thyre birtheopossibility: Ngn Thi Hanh - Hoang Minh Chau - Le Thi Tini



# 15/11/2016 07:09

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#### Yield components and yield of pumpkin lines/varieties in winter season 2016 in FAVRI

No	Line/variety	Number of fruits	Average	Yield (kg/plot)	Yield	Brix
		/plant	fruit weight (kg)	(plot size: 40 m <sup>2</sup> )	(ton/ha)	(%)
1	AVPU 1502	5.04	0.71	35.78	8.95	9.3
2	AVPU 1504	4.17	0.80	33.36	8.34	7.9
3	FAVRI 3	3.88	0.86	33.37	8.34	8.1
4	TN880 F1	2.24	3.09	24.73	6.18	7.4
	(check)					
L	SD (P=0.05)	0.99	0.14	1.18	2.96	
	CV%	17.5	7.70	19.5	19.5	

#### Diseases damage of pumpkin lines/varieties between September 2016 - February 2017

No	Line/variety		Disease damage	Disease reaction	
		Virus	Gummy stem	Powdery	
		(mark)	blight (mark)	mildew	
				(mark)	
1	AVPU1502	1	1	2	Moderate Resistance
2	AVPU1504	1	1	2	Moderate resistance
3	FAVRI 3	1	1	2	Moderate Resistance
4	TLP 868	1	1	2	Moderate Resistance

# **AVPU 1502- Promising pumpkin line in Winter season 2016**





# AVPU 1504- Promising pumpkin line in Winter season 2016



# TOMATO

#### MAFF

DUAN RAU MAN AND COLRACOLAFT) Chọn lọc các dòng/giống cải tua phù hợp với điều kiện nhiệt đới nhằm cải thiện sản lượm, rong chuốg giá trị rau của vùng Dông ym châu Á

Selection of tropically-adapted lines of tomato to improve productivity of the vegetable alue chain in Southeast Asia (Japa VAFF)

> zåy gien/Sowing date: 1 September, 2016 zåy trång/Transplanting dat lån nkåe/Replications: 4

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# 15/11/2016 07:12

# Yield and yield components of tomato line/varieties

				Average fruit weight	Fruit yield		No of plant
No		Line/varieties	No Fruit/plant	(g)	(kg/plot)	Yield ( tons/ha)	harvessted
	1	AVTO1303	17,02	108,3	32,72	40,96	17,75
	2	AVTO1306	14,38	90	25,88	28,76	20
	3	AVTO1409	20,17	150,5	60,7	67,44	20
	4	AVTO1424	25,08	101,8	50,4	56,71	19,75
	5	AVTO0301	26,66	112,6	55,54	66,71	18,5
	6	AVTO9708	23,55	119,6	55,63	62,59	19,75
	7	AVTO1418	39,95	82,74	59,15	72,02	18,25
	8	AVTO1420	26,42	84,08	46,97	52,19	20
	9	AVTO1314	22,37	121,9	62,1	69	20
	10	AVTO1502	23,01	121,5	51,72	62,13	18,5
	11	AVTO0922	18,64	104,8	39,09	43,43	20
	12	AVTO1219	31,69	106,3	67,34	74,82	20
	13	MT1	80,26	28,65	40,82	51,1	17,75
	15	M73	94,47	38,4	41,72	80,62	11,5
	16	MT4	72,26	42,07	43,32	67,56	14,25
	17	MT5	46,45	46,77	30,42	48,29	14
	18	MT6	50,79	53,09	53,92	59,91	20
	19	MT7	49,45	77,44	76,59	85,1	20



# **HOT PEPPER**



#### Yield components and yield hot pepper of lines in autumn-winter season 2016 in FAVRI

No.	Line/Variety	No. of Fruit/pla nt	Fruit weight (g)	Fruit weight/plant (g)	Theoretical yield (ton/ha)	Marketable yield
1	AVPP9703	71.8	6.3	443.5	10.1	9.9
2	AVPP9813	63.0	8.6	535.4	12.4	11.9
3	AVPP0303	23.6	22.8	539.6	13.9	12.0
4	<b>AVPP0707</b>	58.5	9.4	547.1	12.6	12.2
5	AVPP1111	80.4	7.9	627.4	14.4	13.9
6	VI037808	157.0	3.4	514.8	11.6	11.4
7	AVPP1324	105.5	6.5	673.1	15.4	15.0
8	AVPP1346	245.9	2.4	581.3	12.5	12.4
9	AVPP1330	84.7	7.7	650.4	15.1	14.5
10	AVPP1339	83.0	6.7	554.2	12.5	12.3
11	AVPP9602	60.8	10.0	602.5	11.4	11.2

## Diseases and insect damage of hot pepper lines in Autumn - Winter season 2016 in FAVRI

No.	Line/Variety	VR	PB	AN	BL	INSECT
1	AVPP9703	0.0	0.0	0.08	0.42	0.00
2	AVPP9813	0.0	0.0	1.17	0.38	0.00
3	AVPP0303	0.0	8.3	2.46	0.08	0.00
4	AVPP0707	0.0	0.0	1.50	0.08	0.04
5	AVPP1111	0.0	0.0	0.33	0.92	0.04
6	VI037808	0.0	0.0	0.33	0.17	0.00
7	AVPP1324	0.0	0.0	0.38	0.21	0.00
8	AVPP1346	0.0	0.0	0.08	0.00	0.00
9	AVPP1330	0.0	0.0	1.58	0.38	0.00
10	AVPP1339	0.0	4.2	0.83	0.04	0.00
11	AVPP9602	0.0	0.0	1.53	0.29	0.00

VR(=Virus), AN (=anthracnose), PB (=Phytophthora blight), BL (=Bloss soom)
#### AV8 (AVPP1346) - Promising hot pepper line



- Yield//plant): 580 g
- % Marketable : 99
- Fruit Size (LXW) : 5,7x0,9 cm
- Fruit weight: 2-3 g



# AV9 (AVPP1330) - Promising hot pepper line



- Yield/plant): 650 g
- % Marketable : 95,5
- Fruit Size (LxW): (11,2x1,2) cm
- Fruit weight: 9 g



#### AV8 (AVPP1346) - Promising hot pepper line



- Yield//plant): 550 g
- % Marketable : 98
- Fruit Size (LXW) : 5,7x0,9 cm
- Fruit weight: 2,5-3 g



# AV9 (AVPP1330) - Promising hot pepper line



- Yield/plant): 650 g
- % Marketable : 95,5
- Fruit Size (LxW): (11,2x1,2) cm
- Fruit weight: 9 g



#### **Bitter gourd**

- AVBG 1301 and hybrid AVBG 1601 were evaluated promising lines high resistance to Powdery mildew, Cercospora and Luteovirus.

- AVRDC hybrid AVBG 1707 and AVBG 1324 line has chosen by Vietnamese farmers and consumer in Northern Vietnam with good in number of fruit, fruit length, fruit color, fruit bitterness and Moderate Resistance PM, DM, Cerospara and Luteovirus

- AVRDC bitter gourd lines will be using like a valuable germplasm resource for bitter gourd breeding program in Vietnam in general and in FAVRI particular.

# Pumpkin

- There are two AVRDC pumpkin lines such as AVPU 1052 and AVPU 1504 are evaluated promising lines high resistance with virus, Gummy Stem Blight

- AVPU 1502, AVPU 1504, and FAVRI 3 are chosen by Vietnamese farmers and consumer in Northern Vietnam for taste quality, fruit shape and diseases resistance.

- AVRDC pumpkin lines AVPU 1502, AVPU 1504 will be using like evaluable germplasm resource for pumpkin breeding program in Vietnam in general and in FAVRI particular.

# Tomato

- Lines AVTO1418, AVTO1314, AVTO1219 have yield around 70tons/ha. They were evaluated promising lines high resistance to TYLCVD and other diseases in autumn winter in Vietnam.

# Hot pepper

- AV8 (AVPP1346) and AV9 (AVPP1330) were evaluated promising lines in Autumn - Winter season 2016 in FAVRI, Hanoi, Vietnam

- The experiment will be evaluated under the disadvantaged conditions of the spring-summer 2017

### IV. RECOMMENDATIONS FOR FUTURE COORPERATION

- 1. Conduct short training courses in vegetable breeding for scientists
- 2. Exchange materials of vegetable germplasm between AVRDC and countries
- 3. Set up co-operation programs of vegetable development
- 4. Exchange experts and researchers to sharing experience in research and development

