

Short Communication

EVALUATION PROMISING SOYBEAN VARIETIES

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ABSTRACT

New soybean varieties are being tested over the last few years. These involve the development of high yielding, short duration genotypes (roughly 80 days) with high value crops, to be adapted to rice based cropping pattern areas in Mekong Delta. In the areas, fresh water is relatively scarce in dry season. Somewhere, salt intrusion has become a problem. After three seasons, the varieties were assessed and GxE analyzed over multilocal yield trials. Promising genotypes were recommended as OMDN110, OMDN111, OMDN112, OMDN109, OMDN113, OMDN114. They exhibited their high yield and stability. They were proposed to be released soon. OMDN1, OMDN115, OMDN116 especially obtained high productivity but they are not stable due to seasonal reason. They should be conducted more tests in next time.

INTRODUCTION

Soybean is one of traditional crops and it is a main source of food for human and animals. The seed of soybean consist of 40% protein, 18% fat. Nowadays, the USA becomes one of the most countries on soybean producing and exporting in the world.

In Vietnam, soybean growing area is 197,800 ha (MARD figure in 2010) with the production of 296,900 ton and the average yield of 1.50 t/ha. In Mekong Delta, the growing area is approximately 11,000 ha with the fast increase rate as compare to South-Eastern region and High Plateau, recently. The cropping pattern of rice - soybean, rice - soybean - rice, rice - soybean - soybean, rice - soybean - aquatic culture have been popularly developed in Mekong delta.

New soybean varieties become the farmer need for rice-soybean rotation in Mekong Delta. Old soybean varieties such as Nam Vang, Palmeto were cultivated too long and degenerated. Their productivity is low and unstable. Their resistance

ability to main pests and diseases are not stable too.

Raw material from soybean for animal feed stuff, shrimp and Pangasius fish has increased year by year. Most were imported with roughly two million ton / year. Soybean breeding becomes an urgent need in Mekong Delta because it now obtained the highest productivity in Vietnam with average yield > 2.2 ton/ ha. Big challenges are submergence tolerance, drought tolerance, Spodoptera and Heliothis resistance, short duration adapted to rice based cropping system.

The study aims at developing new high-yielding soybean varieties resistant to major pests, and short-duration.

MATERIALS AND METHODS

1. Materials

16 promising soybean genotypes have been selected through crossing during 2001-2010, ATF15 was used as check variety.

Table 1. List of soybean lines in the experiments

No.	Desigantion	Origin
1	OMDN110	MT§176/ ATF7
2	OMDN111	MT§455-3 4/ OMDN1
3	OMDN112	AK05/ OMDN29
4	OMDN109	DT84/ G20
5	OMDN113	MT§176/ ATF15
6	OMDN114	MT§ 517-8/ ATF15
7	OMDN1	MT§ 483-4/ G25-2
8	OMDN115	Marker-assisted selection
9	OMDN116	Nang vang/ HSP3
10	OMDN117	SARI
11	OMDN118	MT§ 652-4/ G10
12	ATF15 (Check)	DT93/ ATF16
13	OMDN29	Marker-assisted selection
14	OMDN36	Backcross between transgenic line and recurrent
15	OMDN32	Marker-assisted selection
16	OMDN34	Marker-assisted selection

2. Methods:

The 16 best varieties were selected for yield trials in 2009 dry season and wet season. The experiments were laid out in randomized complete block design (RCBD) with 3 replications, spacing 20 x40 cm, sowing 3 grains/ hill.

Fertilizer dosages: 40 - 60 - 40 kg N - P₂O₅ - K₂O / ha.

2009 dry season (DS) Sowing date: 7 Dec, 2009
2009 wet season (WS) Sowing date: 27 April, 2009

RESULTS AND CONCLUSIONS.



Figure 1. Variety nurseries

In most cases, rice is the only option during the wet season and mostly the sole crop before the introduction of the high yielding short maturing varieties. Additional options are currently being attempted for the dry season. Rice-rice fits well in areas where salinity level is not too high during the

dry season with the use of short maturing varieties and some farmers even grow three rice crops during the year. In areas where is relatively high during the dry season and fresh water is scarce, non-rice crops like soybean seems promising. Rice intercropped with soybean can be considered

as a good source of income for farmers and selection of better varieties together with the adjustment of sowing dates, water management and cultural practices, together with proper training of farmers in farming these new crops will help increase crop production and improve

farmer's conditions. For these reasons, the CLRRRI continued to develop and test new varieties of different crops in these areas, and some examples of high yielding soybean varieties are presented in Table 2, 3, 4, 5

Table 2. Growth Duration of Genotypes

No.	Desigantion	Days to flower		Plant Height		Duration	
		DS	WS	DS	WS	DS	WS
1	OMDN110	34	36	33.0	53.0	85	87
2	OMDN111	34	36	26.1	50.3	82	91
3	OMDN112	35	34	26.7	49.1	82	90
4	OMDN109	34	34	25.3	43.3	80	86
5	OMDN113	35	37	29.0	55.2	84	87
6	OMDN114	34	39	21.0	49.4	85	93
7	OMDN1	33	31	22.5	44.2	76	78
8	OMDN115	36	31	40.5	62.4	84	86
9	OMDN116	33	31	38.7	57.9	84	88
10	OMDN117	36	40	34.8	49.3	78	97
11	OMDN118	34	33	27.1	48.0	78	81
12	ATF15 (Check)	34	31	23.5	38.5	77	78
13	OMDN29	34	31	14.6	21.4	84	88
14	OMDN36	34	31	13.0	22.1	84	88
15	OMDN32	34	30	15.9	21.0	85	88
16	OMDN34	36	29	14.8	20.1	83	89

Table 3. Agronomic characters of varieties

No.	Desigantion	Usuesul branches		No. Interpose/plant	
		DS	WS	DS	WS
1	OMDN110	3.3	2.5	9.5	12.5
2	OMDN111	3.5	3.7	8.1	12.6
3	OMDN112	3.2	4.9	8.3	12.4
4	OMDN109	3.7	3.2	8.2	11.1
5	OMDN113	2.9	2.5	8.9	13.1
6	OMDN114	3.2	3.5	8.5	12.0
7	OMDN1	3.0	2.8	7.0	11.5
8	OMDN115	2.8	2.9	10.6	14.5
9	OMDN116	3.2	2.1	10.7	13.5
10	OMDN117	4.0	3.1	9.4	13.2
11	OMDN118	3.4	4.1	8.7	11.9
12	ATF15 (Check)	2.6	3.3	8.1	10.7
13	OMDN29	2.5	2.1	5.0	8.5
14	OMDN36	2.1	2.2	4.9	7.4
15	OMDN32	2.1	2.4	5.7	7.7
16	OMDN34	2.1	1.9	5.1	7.3
CV(%)		21.1	21.2	13.1	9.1
LSD 0.05		1.04	1.065	1.72	1.654

Table 4. Yield components of varieties

No.	Desigantion	Total pods/plant		(% ³ -Grain pods/plant		100-grain weight (gr)	
		DS	WS	DS	WS	DS	WS
1	OMDN110	26.5	42.2	26.9	26.1	14.9	16.3
2	OMDN111	22.0	48.1	14.8	33.3	15.3	18.8
3	OMDN112	21.5	52.9	10.8	29.1	15.7	18.0
4	OMDN109	23.7	44.3	22.8	15.9	12.3	15.4
5	OMDN113	18.5	45.7	11.8	29.2	16.4	14.9
6	OMDN114	23.3	48.9	12.0	33.5	13.8	17.6
7	OMDN1	17.6	37.2	13.6	33.4	16.5	16.9
8	OMDN115	25.3	54.1	12.0	25.3	15.8	19.6
9	OMDN116	24.3	38.5	10.1	33.4	17.3	20.8
10	OMDN117	25.5	66.1	36.6	44.3	9.8	13.1
11	OMDN118	17.8	48.9	19.9	28.3	10.4	12.7
12	ATF15 (Check)	21.0	42.8	18.7	18.4	14.2	15.9
13	OMDN29	12.2	23.1	37.2	21.2	17.4	23.2
14	OMDN36	13.5	28.5	17.3	16.3	17.8	22.7
15	OMDN32	15.9	27.1	13.4	18.8	18.5	22.6
16	OMDN34	12.4	23.8	14.0	21.2	17.3	23.1
CV(%)		25.4	16.4	22.9	20.7	2.17	3.26
LSD 0.05		8.34	11.32	8.41	9.507	0.55	0.63

Table 5. Yield of varieties

No	Desigantion	Yield (tons/ha)	
		DS	WS
1	OMDN110	2.39a	2.86a
2	OMDN111	2.18ab	2.70abc
3	OMDN112	2.08ab	2.99a
4	OMDN109	2.03abc	2.39cd
5	OMDN113	2.03abc	2.48bcd
6	OMDN114	2.03abc	2.95a
7	OMDN1	1.95bcd	2.40cd
8	OMDN115	1.94bcd	2.50bcd
9	OMDN116	1.94bcd	2.78ab
10	OMDN117	1.90bcde	1.94ef
11	OMDN118	1.67cdef	1.77f
12	ATF15 (Check)	1.65cdef	2.19de
13	OMDN29	1.53ef	1.11g
14	OMDN36	1.40f	1.34g
15	OMDN32	1.29f	1.22g
16	OMDN34	1.29f	1.01g
CV(%)		13.2	9.4



Figure 2. Yield trials and Demonstrations

CONCLUSIONS

- During two seasons, the varieties have been evaluated and GxE analyzed, six varieties OMDN110, OMDN111, OMDN112, OMDN109, OMDN113, and OMDN114 obtained stable and high-yielding. They were proposed to be released soon.
- The OMDN1, OMDN115, OMDN116 obtained high yield but their yield still depended on given season. They should be more confirmed next seasons.

Giống đậu nành triển vọng ở Đồng bằng Sông Cửu Long

Khảo nghiệm các giống đậu nành từ những tổ hợp lai tại Viện Lúa Đồng bằng Sông Cửu Long được thực hiện tại nhiều điểm và qua hai vụ liên tục. Các giống triển vọng là OMDN110, OMDN111, OMDN112, OMDN109, OMDN113, và OMDN114. Các giống cần tiếp tục theo dõi là OMDN1, OMDN115, OMDN116