

P_2.12: Screening maize hybrids for resistance to the maize weevil (*Sitophilus zeamais* Motsch.) in Thailand

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Introduction

Infestation of the maize weevil, *Sitophilus zeamais* (Motsch.), causes up to 90% grain damage during storage in Thailand (Suprakarn *et al.*, 1982). Chemical control is the most commonly used practice to address the problem. However, high cost of insecticide, danger of resistance building up and hazards of insecticide are serious issues of concern. Host plant resistance is a preferred method for integrated pest management of stored maize. This study aimed at evaluating the level of resistance under laboratory conditions by promising hybrids to infestation by *S. zeamais*. Superior hybrids will be further nominated to the maize breeding program.

Materials and Methods

Sixteen hybrids were screened for damage caused by *S. zeamais* in a no-choice test. Freshly-harvested grains of each hybrid were cleaned and dried to 12-13% moisture content. Thirty grams grain of each hybrid was put in a grass jar with a ventilated lid. Fifteen unsexed 1-7-day-old adult weevils were introduced in each jar for seven days. The experiment was arranged in RCBD with three replications and was kept in the laboratory for 90 days. Number of emerged adults, percentage of damage grain and weight losses were used to evaluate the damage level.

Results and Discussion

There was statistically significant differences ($P < 0.05$) among hybrids (Table 1) for all evaluated parameters. The average of grain weight losses used as the resistant parameter was 12.79% (Horber, 1987). NSX042022 showed the lowest number of emerged weevils, percentage of damaged grain and percentages of grain weight losses.

NSX052011, NSX052016 and NK48 showed the highest number of emerged weevils and percentage of damaged grain. NK48 showed the highest percentage of grain weight losses. As no maize weevils resistant variety was used in this experiment, the identification level of resistance modified from Bergvinson *et al.*, (2002) was applied. Seven hybrids were identified as resistant, four hybrids as moderately resistant and five hybrids as susceptible.

Conclusions

Seven hybrids were identified as resistant to *S. zeamais*. NSX042022 showed lowest value of emerged weevil adults, percentage of grain damaged and percentages of grain weight losses. Hybrids identified as resistant and moderately resistant will be considered for nomination to the maize breeding program.

References

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Table 1. Comparison of adult weevils (*S. zeamais* Motsch.) emerged/jar, percentages of grain damage and grain weight losses of 16 hybrids after 90 days of storage in laboratory (Nakhon Sawan, 2009)

No.	Hybrids	No of <i>S.zeamais</i>	% damaged grain	% weight losses	Level of resistance
1	NSX052011	147.25 e	95.59 f	14.45 ab	MR
2	NSX052012	121.50 de	88.62 ef	18.21 ab	S
3	NSX052014	63.00 a-d	56.29 b-d	12.75 ab	MR
4	NSX052015	116.00 b-e	87.23 d-f	12.99 ab	MR
5	NSX052016	150.25 e	95.74 f	20.32 b	S
6	NSX052018	117.50 c-e	84.79 c-f	16.64 ab	S
7	NSX062006	64.75 a-d	54.43 bc	8.33 ab	R
8	NSX062012	56.50 a-d	58.03 b-e	6.06 ab	R
9	NSX062029	47.00 a-c	49.79 ab	8.46 ab	R
10	NSX062030	74.75 a-d	57.24 b-e	9.01 ab	R
11	NSX042022	21.00 a	21.70 a	2.32 a	R
12	Nakhon Sawan 3	52.00 a-d	52.13 b	5.85 ab	R
13	Nakhon Sawan 2	45.75 ab	41.11 ab	5.44 ab	R
14	NK 48	161.25 e	92.58 f	33.84 c	S
15	Big919	110.50 b-e	66.03 b-f	13.76 ab	MR
16	CP-DK888	104.00 b-e	85.79 c-f	16.24 ab	S
	Mean	90.80	67.94	12.79	
	CV (%)	46.42	28.34	73.89	

Means followed by common letter are not significantly different at 5% level by DMRT

Level of resistance based on % grain weight losses (R=Resistance, MR=Moderate resistance, S=Susceptible) Bergvinson *et al* (2002)