



# Weight loss of Raj4037, Raj3077 and Raj3765 wheat varieties to check the status of relative resistance against the stored insect pest *Rhyzopertha dominica*

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**Abstract-** Since many food grains require extended storage, post-harvest losses in agriculture are raising in tandem with the expansion of wheat, corn, bajra, rice, and maize production. The actions of the insect, like feeding locations and oviposition rates, are discovered to be influenced by varieties. It was proposed to conduct a systematic investigation to link the physiochemical characteristics of the grains with the wheat varieties' resistance to storage insects. Varietal resistance to storage insects is a potential way to reduce post-harvest losses, according to a later analysis of the storage insects. Growth, development duration, and weight loss were used to classify several wheat types according to their resistance to *Rhyzopertha dominica*. Percentage loss in weight of different wheat varieties due to damage caused by *Rhyzopertha dominica* revealed that the maximum loss occurred in RAJ 3777 (13.3) followed by RAJ 4037 (12.30), and RAJ 3077 (12.00). The minimum weight loss was observed in RAJ 3765 (5.00) which differed significantly with all other test varieties.

**Keywords-** Wheat variety, *Rhyzopertha dominica*.

**INTRODUCTION-** A common and significant issue is food grain loss during storage due to various insects and pests. For the growth and population proliferation of any insect pest, the climate and storage conditions are often beneficial. Serious negative effects, such as genetic resistance and hazardous residue, result from using insecticides to control insects in grain storage. Farmers may be able to choose food grain varieties that are less likely to be harmed by insects and that will enable them to efficiently and reasonably easily preserve food grains from pests by using research on the resistance or relative susceptibility of different grain varieties to attack under storage conditions. As long as the traits causing this resistance are found and thoroughly investigated in the field, resistant types against stored insects are definitely a possibility. Certain wheat cultivars have been found to be resistant to stored insect pests. These various responses are said to be caused by certain grain characteristics, such as grain kinds, husk thickness and texture, relative hardness of kernels, protein and carbohydrate content, etc.

Raj3077, Raj 3765 and Raj4037 wheat varieties were collected from Basni Mandi, Jodhpur.

## MATERIAL AND METHOD

- Maintenance of insect culture-

Twenty-five pairs of adult insects that were one to two days old were released for oviposition in a culture bottle containing 100g of wheat grains after a pure culture of the test insect, *Rhizopertha dominica*, was obtained. To maintain a stock culture and provide an uninterrupted supply of the majority of insects required for the experiment, the newly emerged adults were also put in fresh culture bottles containing wheat grains.

- Release of insects in different wheat varieties-

Each wheat variety culture container included twenty-five recently emerged adults. It takes 35 days for *Rhizopertha dominica* larvae in their first instar to mature into adults. The larvae and pupae develops inside the grains, hence emergence of adults were recorded after 35 days of release (the data were analyzed). The culture was kept untouched for 40 days. Finally total number of adult emerged and developmental period (in days) was recorded. The weight loss also was recorded after the emergence of adult. It was calculated by subtracting the final weight with the initial weight and converting it in to percentage.

$$\text{Percentage weight loss} = \frac{A - a}{A} \times 100$$

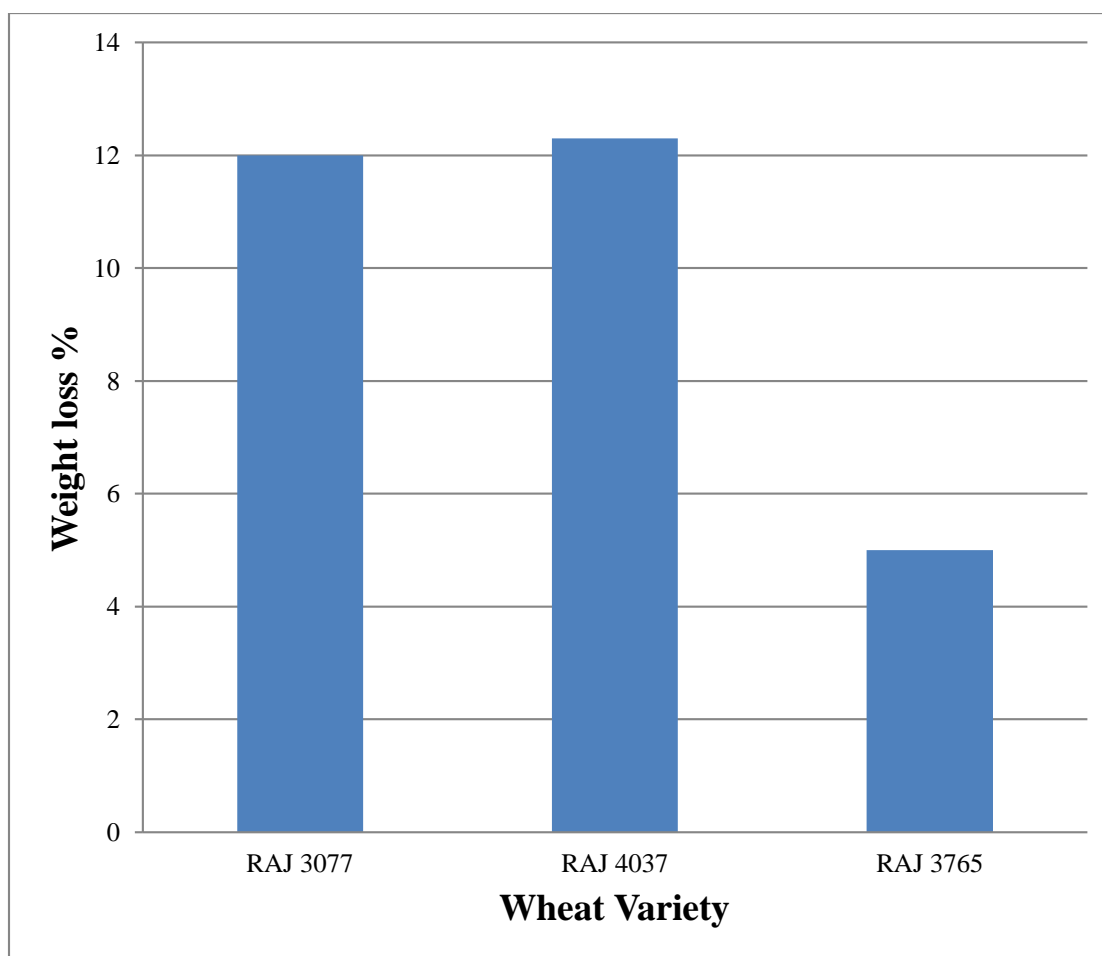
Where, A = initial weight of wheat grain

a = final weight of wheat grain

### Weight loss % of different wheat variety

S.NO.	Wheat variety	Weight loss			Weight loss % **
		Initial (g)	Final(g)	Total (I - F)	
1	RAJ 3077	10	8.8	1.2	12.00 (20.6)
3	RAJ 4037	10	8.77	1.23	12.30 (20.02)
4	RAJ 3765	10	9.5	0.5	5.00 (13.6)

Graphical presentation of wheat weight loss-



Weight Loss % of varieties of Wheat

### Result –

The given data indicate that the different wheat varieties produce different growth and reduction responses. The categorization of different wheat varieties for their resistance to *Rhizopertha dominica* was made on the basis of growth, development period and weight loss.

Percentage loss in weight of different wheat varieties due to damage caused by *Rhizopertha dominica* revealed that the maximum loss occurred in RAJ 3777 (13.3) followed by RAJ 4037 (12.30), and RAJ 3077 (12.00). The minimum weight loss was observed in RAJ 3765 (5.00) which differed significantly with all other test varieties.

### Discussion-

**Singh and Thapar(1998)** resulted the average number of adult emerged in different wheat variety significantly ranged from 12-90% for *Rhizopertha dominica*. **Nehra et al., (1983)** used flours from 13 varieties of wheat for resistance of infestation by *Tribolium castaneum* and concluded that Raj 1646 was the most resistant, exhibiting the adult emergence. The loss in weight of wheat varieties due to attack of test insects range from

Ten wheat cultivars were studied by **Ramzan et al., (1991)** for storage losses by insect pest

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