Stress Combination and their Interaction in Plants (SCIP) Database

Website link: http://www.nipgr.res.in/scipdb.php

Effect on wheat cultivars (*Triticum aestivum* L.)

The net impact of individual and combined stress on the plant

Stress 1: *Puccinia recondita*
Stress 2: *Septoria nodorum*
Stage of plant: Heading stage

The table shows the impact of individual and combined stress on yield loss of wheat cultivars

Cultivar	Treatment	Response under combined stress (Type A parameter*) Reduction over control (%) Yield (kernel weight)
Flamingo**	*P. recondita* (2.5×10^5 spores/mL) + 21 days interval + *S. nodorum* (2.5×10^5 spores/mL) (Sequential stress)	40.47 ↓
	P. recondita (2.5×10^5 spores/mL)	9.52 ↓
	S. nodorum (2.5×10^5 spores/mL)	7.14 ↓
Flamingo**	*P. recondita* (2.5×10^5 spores/mL) + 21 days interval + *S. nodorum* (2.5×10^5 spores/mL) (Sequential stress)	39.02 ↓
	P. recondita (2.5×10^5 spores/mL)	26.83 ↓
	S. nodorum (2.5×10^5 spores/mL)	7.33 ↓
Hope × Timstein	*P. recondita* (2.5×10^5 spores/mL) + 21 days interval + *S. nodorum* (2.5×10^5 spores/mL) (Sequential stress)	23.68 ↓
	P. recondita (2.5×10^5 spores/mL)	10.53 ↓
	S. nodorum (2.5×10^5 spores/mL)	0
Joss Cambier	*P. recondita* (2.5×10^5 spores/mL) + 21 days interval + *S. nodorum* (2.5×10^5 spores/mL) (Sequential stress)	45 ↓
	P. recondita (2.5×10^5 spores/mL)	17.5 ↓
	S. nodorum (2.5×10^5 spores/mL)	12.5 ↓
Rubis	*P. recondita* (2.5×10^5 spores/mL) + 21 days interval + *S. nodorum* (2.5×10^5 spores/mL) (Sequential stress)	63.64 ↓
	P. recondita (2.5×10^5 spores/mL)	31.82 ↓
	S. nodorum (2.5×10^5 spores/mL)	4.55 ↓

For raw data – Click here (.xlsx file)

Reference–Vandarwal AF, Shearer BL, Zadoks JC (1970) Interaction between *Puccinia recondita* f. sp. *triticina* and *Septoria nodorum* on wheat, and its effects on yield. Neth. J. PI. Path.**76:** 261-263

Note: *Values presented in the table were calculated using the formula described below.*

$$\text{Reduction over control (\%)} = \frac{(\text{Value}_{\text{Control}} - \text{Value}_{\text{Stress}})}{\text{Value}_{\text{Control}}} \times 100$$

1) '⬇'- indicates plant parameter is more affected by stress that leads to high susceptibility (higher the value more the damage).
2) '0'- indicates plant parameters less/not affected by stress leading to improved resistance (higher the value lesser the damage)

'*'- *For more information on parameters classification, please refer to 'methodology' tab*
'**'-cultivars treated with different vernalization treatments. Vernalization is the induction of plant's flowering process by exposure to the prolonged cold of winter, or by an artificial equivalent

The inference from the study: Vanderwal *et al*., 1970 studied the interaction between *P. recondita* (causal agent of brown rust) and *S. nodorum* (causal agent of chaff brown) on the yield loss of wheat cultivars Flamingo, Joss cambier, Hope × Timstein, and Rubis by inoculation both the pathogens sequentially and singly. Flamingo and Joss cambier, possess moderate susceptibility to *P. recondita* and susceptibility to *S. nodorum*, therefore showed a more yield loss in comparison with the cv. Hope × Timstein. The cultivar Hope × Timstein showed less yield loss in comparison with the other cultivars as it is mildly resistant to *P. recondita* and moderately susceptible to *L. nodorum.* As cultivar Rubis is likely vulnerable to both pathogens, it showed more yield loss in comparison with other cultivars. **However, overall observation from this study reveals that the yield loss was additive with combined treatment of both the pathogens in comparison with the plants inoculated with the single pathogen only, for all the cultivars.**