Relation between density of Phalaris minor and broadleaf weeds with respect to the Grain Yield of crop

Results

Correlation of weed density with grain yield

A strong negative correlation between grain yield and weed density was evident in the study. The higher grain yield was mainly due to the broad-spectrum weed control provided by herbicide combinations, which tilted competition in favor of the crop, leading to higher production of crop. *Phalaris minor* caused 86.4 and 86.3% variation in grain yield in 2021-22 and 2022–23. During the growing seasons of 2021-22 and 2022–23, the density of broadleaf weeds significantly influenced wheat grain yield explaining 85.6 and 85.8% of variance, respectively (Table 1, Fig. 1).

There was strong negative correlation of grain yield of wheat with density of P. minor weeds, with R2 of 0.864 and 0.863 during 2021-22 and 2022-23, respectively. The regression equations were as below –

$Y = - 88.555 X + 6647.4$ (2021-22)

$Y = - 84.479 X + 6761.8$ (2022-23)

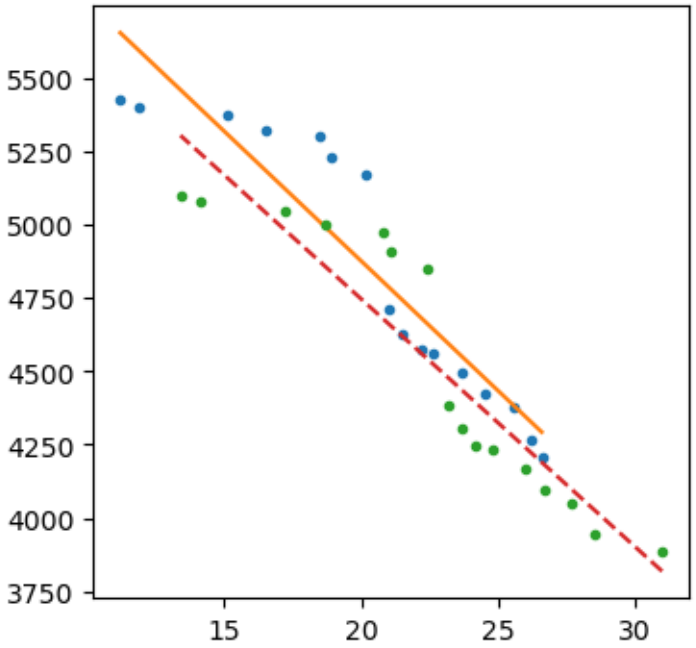
Similarly, R2 for correlation between grain yield of wheat with density of broadleaf weeds was 0.856 and 0.857 during 2021-22 and 2022-23, respectively. The regression equations were as below –

$Y = - 44.296 X + 5951.5$ (2021-22)

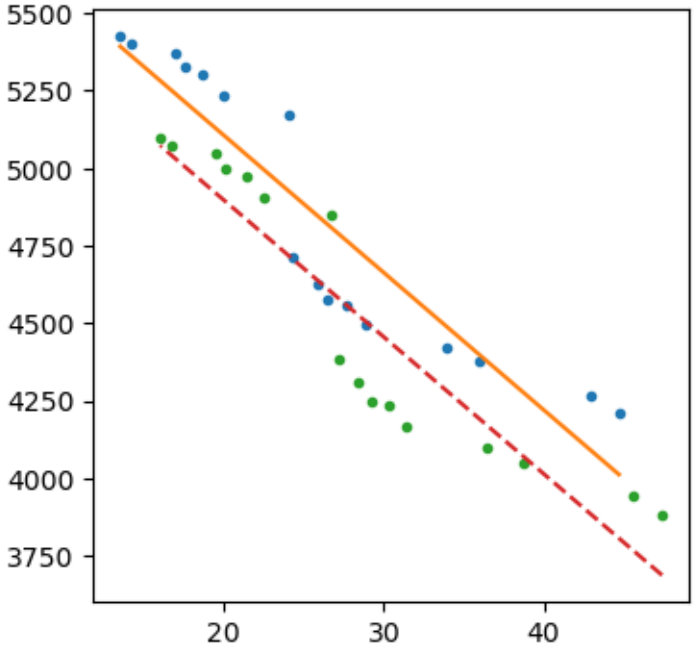
$Y = - 44.119 X + 6103.5$ (2022-23)

Table 1. Effect of metribuzin MTZ) doses, time and method of application on density of *Phalaris minor* and broadleaf weeds (BLW) (No. m^{-2}) in wheat at 90 DAS and grain yield of zero tillage wheat under residue retention

Treatment	**Time of application**	***Phalaris minor* (No. m^{-2})**		**Broadleaf weeds (No. m^{-2})**		**Grain yield of wheat (kg ha^{-1})**	
		2021-22	**2022-23**	**2021-22**	**2022-23**	**2021-22**	**2022-23**
MTZ-210 spray	**PRE**	26.6	31.0	44.7	47.4	4,209	3,884
MTZ-350 spray		26.2	28.5	42.9	45.6	4,267	3,942
MTZ-105 spray	**21 DAS**	25.6	27.7	36.0	38.7	4,378	4,050
MTZ-210 sand-mix		24.5	26.7	33.9	36.4	4,422	4,097
MTZ-280 sand-mix		23.7	26.0	28.8	31.4	4,495	4,170
MTZ-350 sand-mix		22.6	24.8	27.6	30.3	4,560	4,235
MTZ-210 urea-mix		22.2	24.2	26.4	29.2	4,574	4,249
MTZ-280 urea-mix		21.5	23.7	25.8	28.4	4,625	4,307
MTZ-350 urea-mix		21.0	23.2	24.3	27.2	4,712	4,387
MTZ-105 spray	**35 DAS**	20.2	22.4	24.0	26.7	5,174	4,849
MTZ-210 sand-mix		18.9	21.1	19.9	22.5	5,232	4,907
MTZ-280 sand-mix		18.5	20.8	18.6	21.4	5,301	4,976
MTZ-350 sand-mix		16.5	18.7	17.6	20.1	5,325	5,000
MTZ-210 urea-mix		15.1	17.2	17.0	19.5	5,372	5,047
MTZ-280 urea-mix		11.9	14.1	14.2	16.7	5,401	5,076
MTZ-350 urea-mix		11.2	13.4	13.5	16.0	5,425	5,100



Grain Yield vs P.Minor density (2021-22 & 2022-23)



Grain Yield vs Broadleaf weed density (2021-22 & 2022-23)

Fig. 1. Correlation between wheat grain yield, and density (No. m^{-2}) of *Phalaris minor* and broadleaf weeds under different treatments of metribuzin