

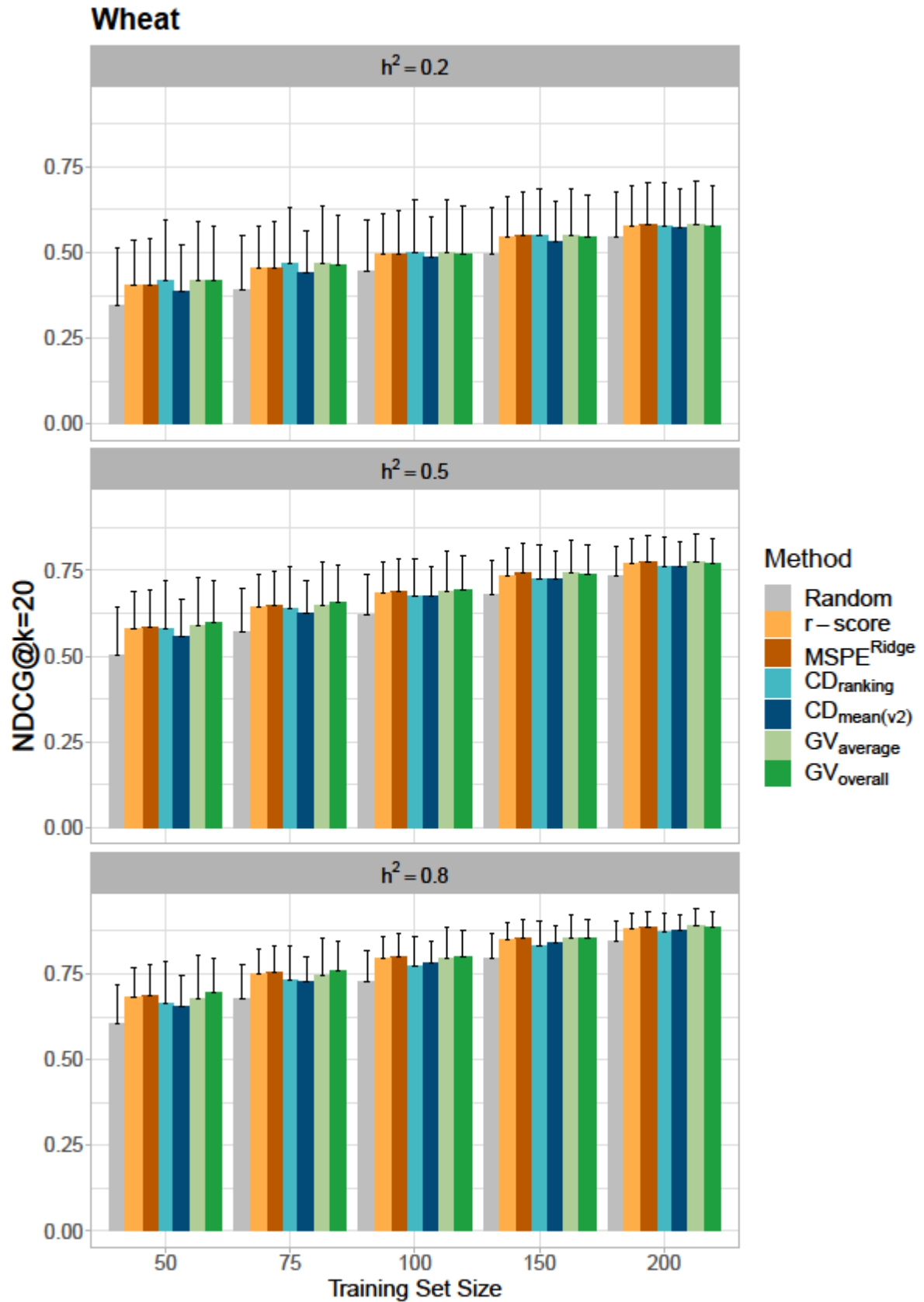


Figure S1: Averages and standard deviations of NDCG values among the best 20 genotypes over the 1000 simulated datasets using the proposed methods in the wheat dataset.

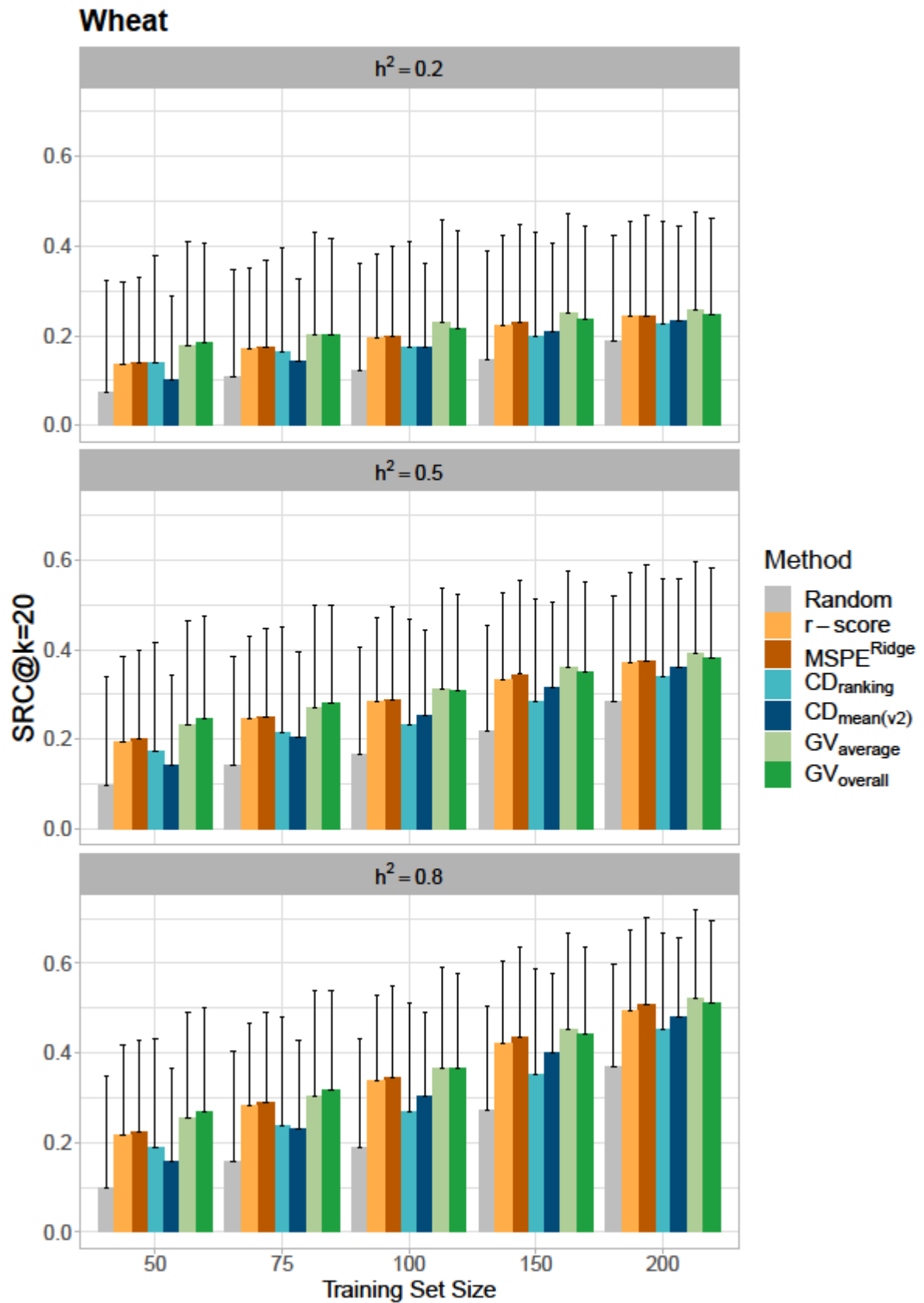


Figure S2: Averages and standard deviations of SRC values among the best 20 genotypes over the 1000 simulated datasets using the proposed methods in the wheat dataset.

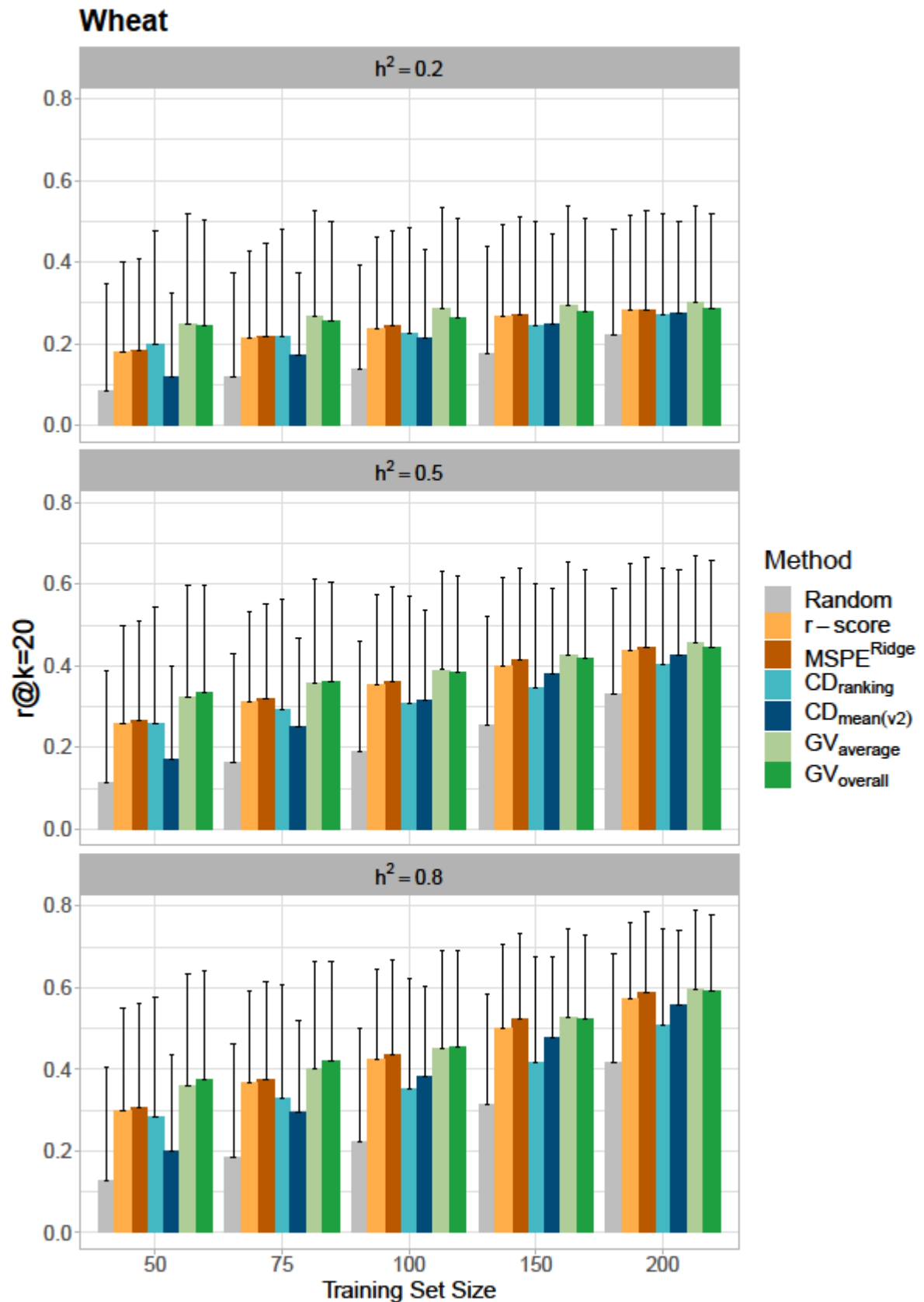


Figure S3: Averages and standard deviations of Pearson's correlation values among the best 20 genotypes over the 1000 simulated datasets using the proposed methods in the wheat dataset.

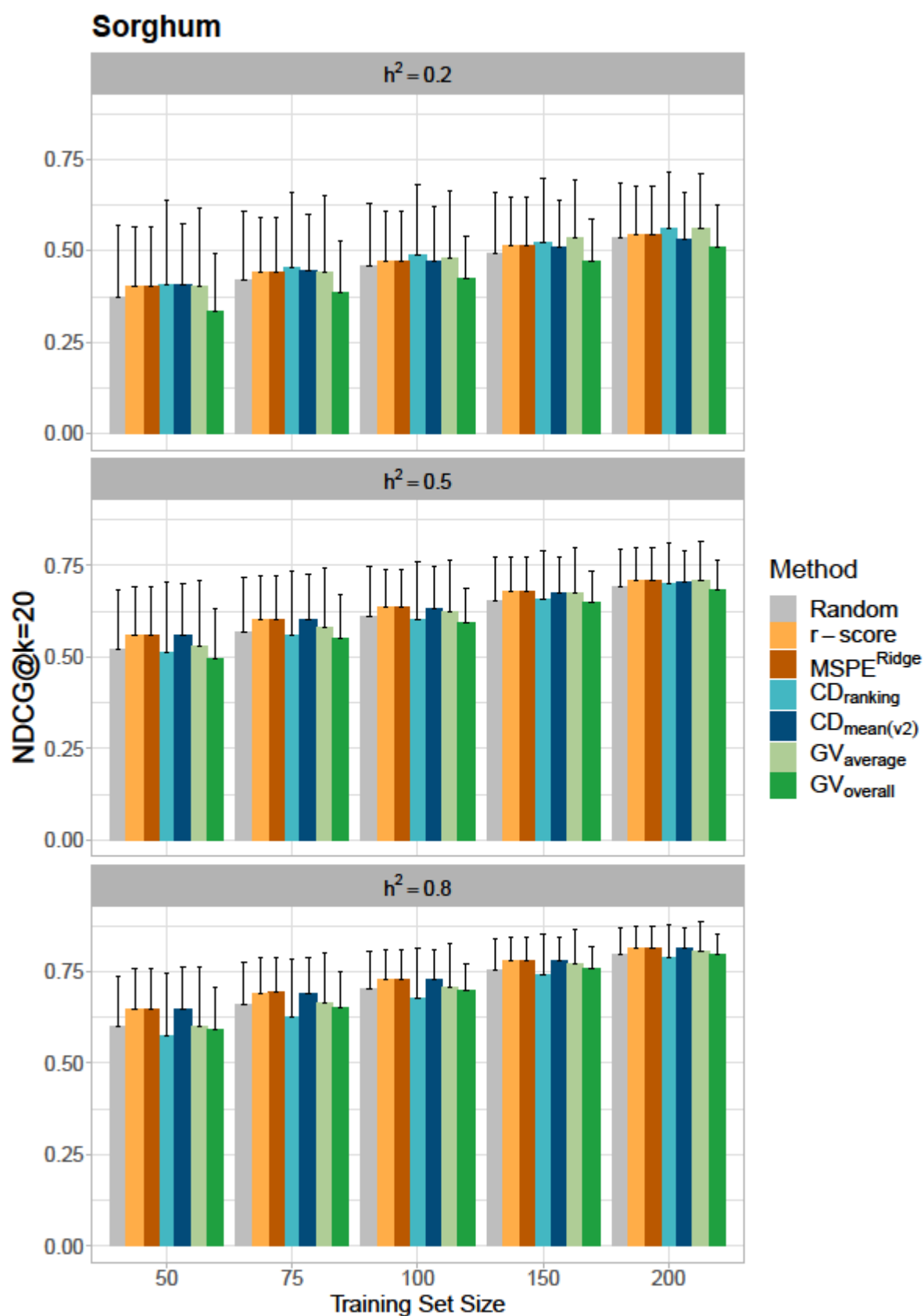


Figure S4: Averages and standard deviations of NDCG values among the best 20 genotypes over the 1000 simulated datasets using the proposed methods in the sorghum dataset.

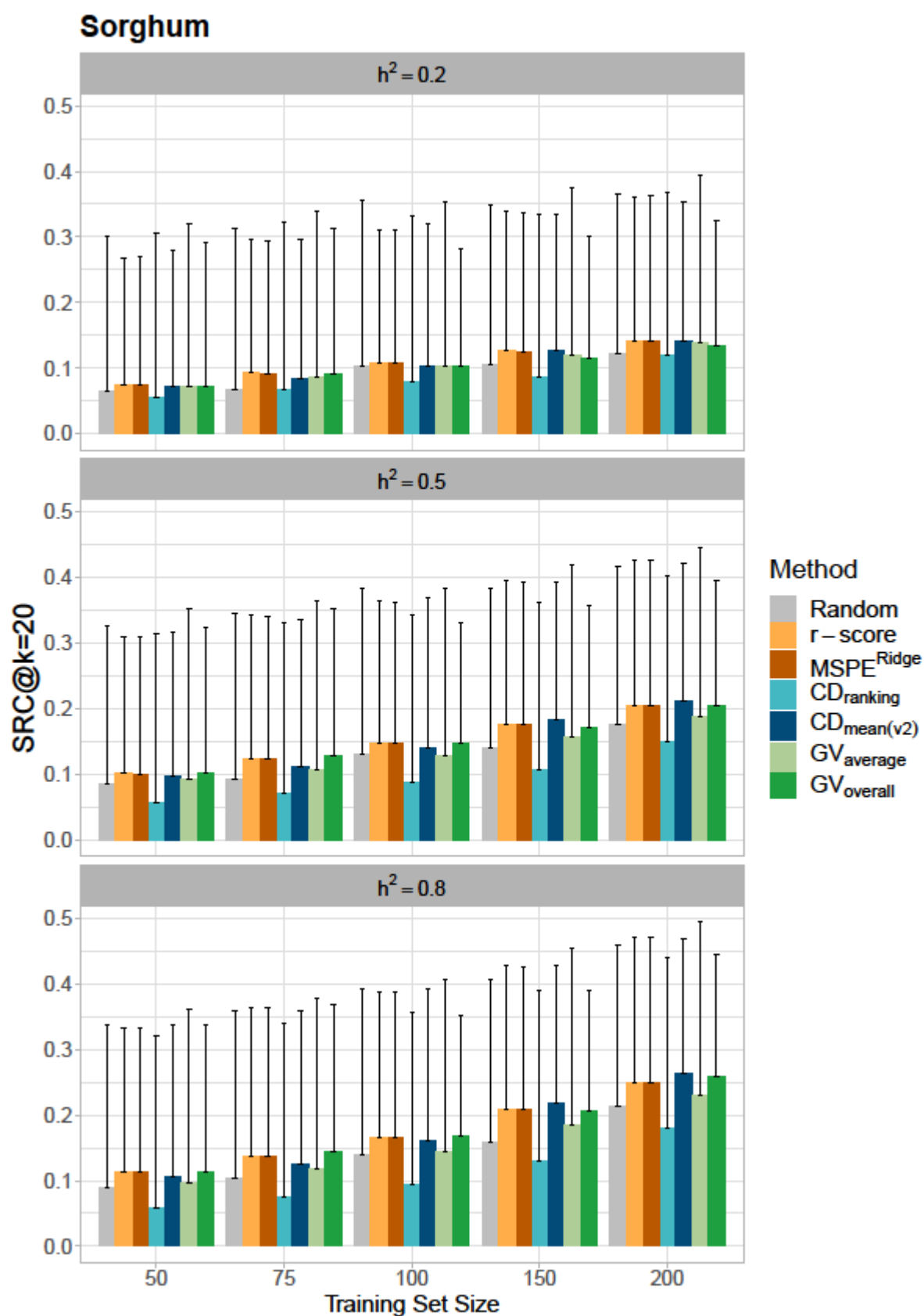


Figure S5: Averages and standard deviations of SRC values among the best 20 genotypes over the 1000 simulated datasets using the proposed methods in the sorghum dataset.

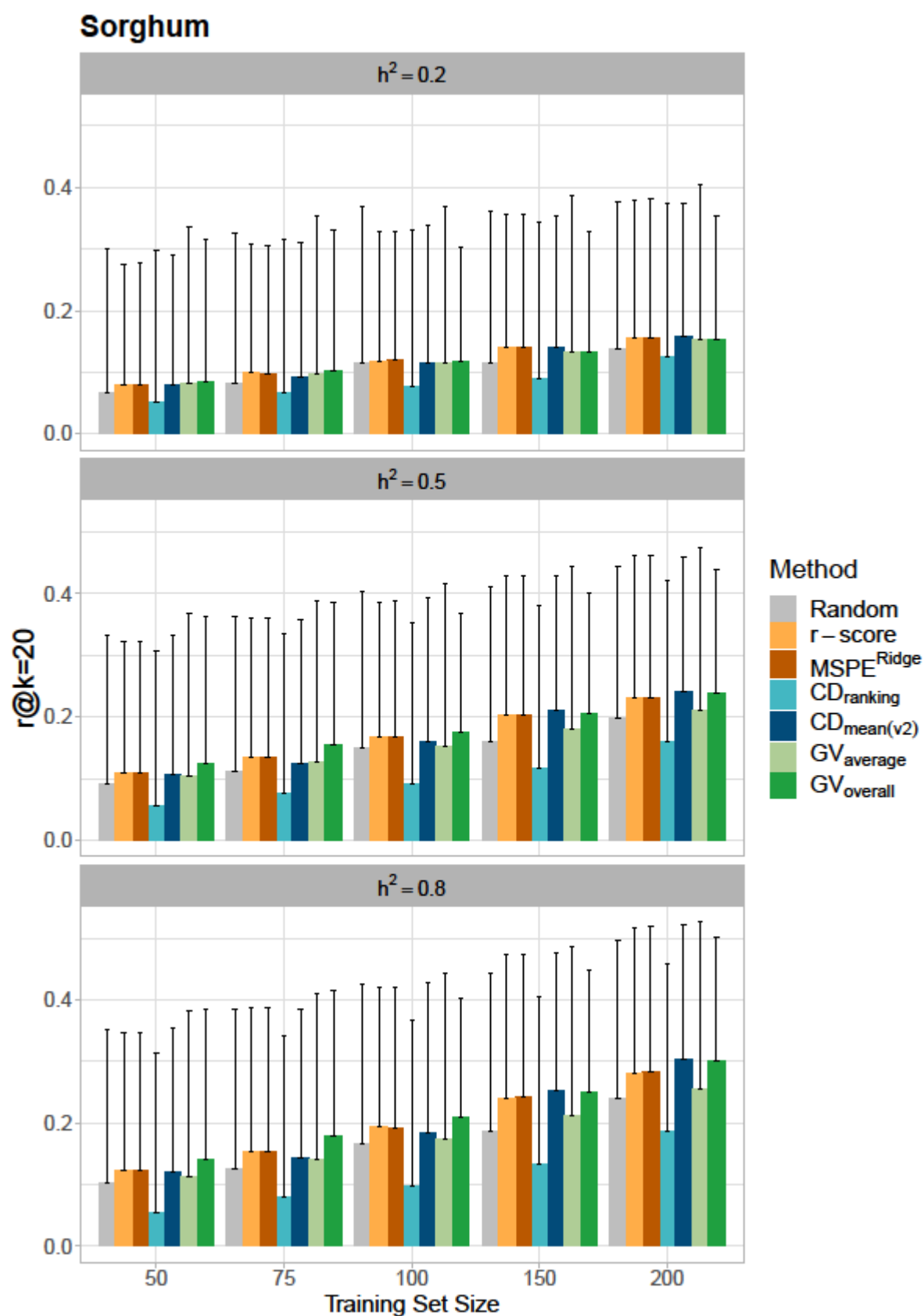


Figure S6: Averages and standard deviations of Pearson's correlation values among the best 20 genotypes over the 1000 simulated datasets using the proposed methods in the sorghum dataset.

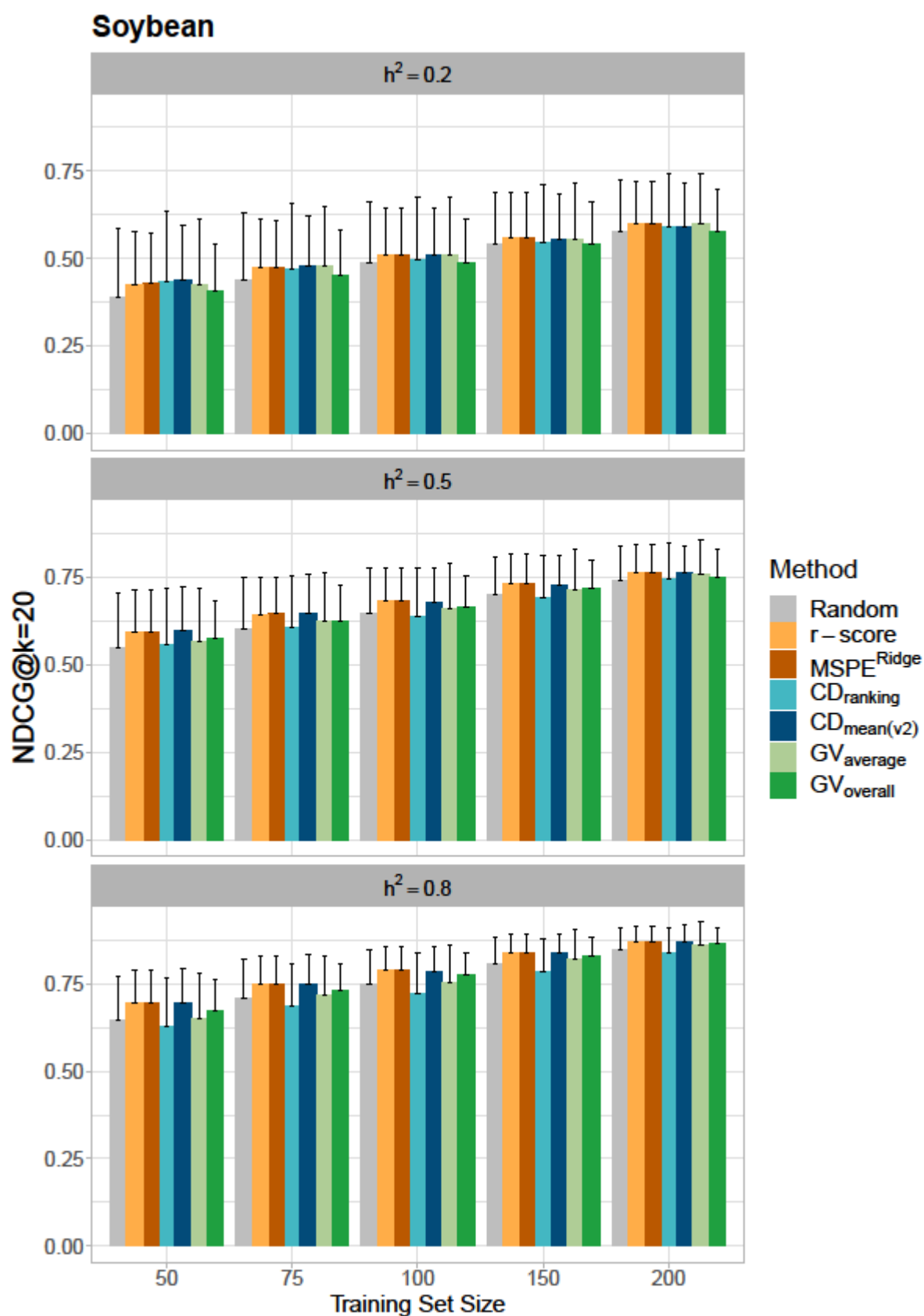


Figure S7: Averages and standard deviations of NDCG values among the best 20 genotypes over the 1000 simulated datasets using the proposed methods in the soybean dataset.

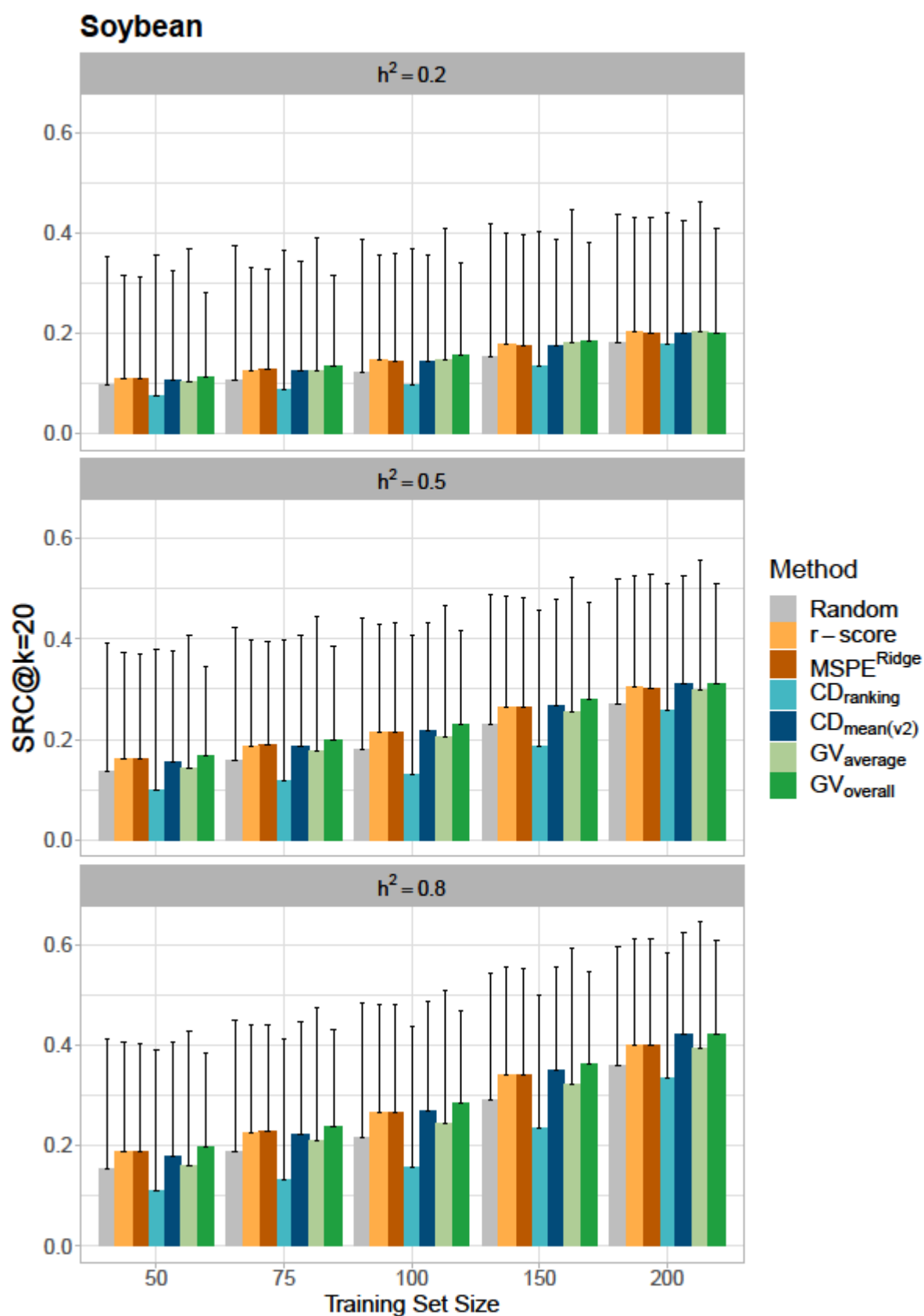


Figure S8: Averages and standard deviations of SRC values among the best 20 genotypes over the 1000 simulated datasets using the proposed methods in the soybean dataset.

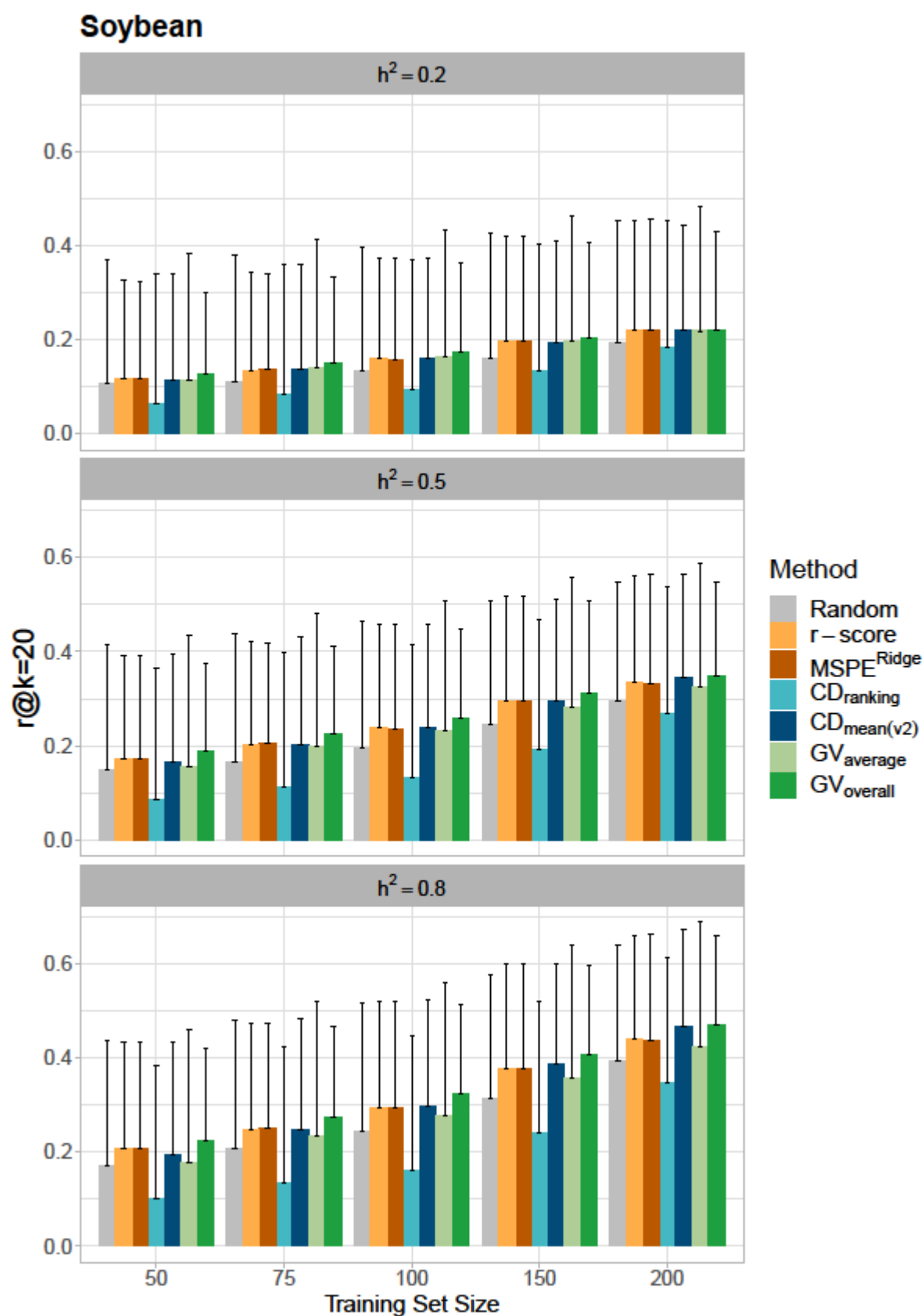
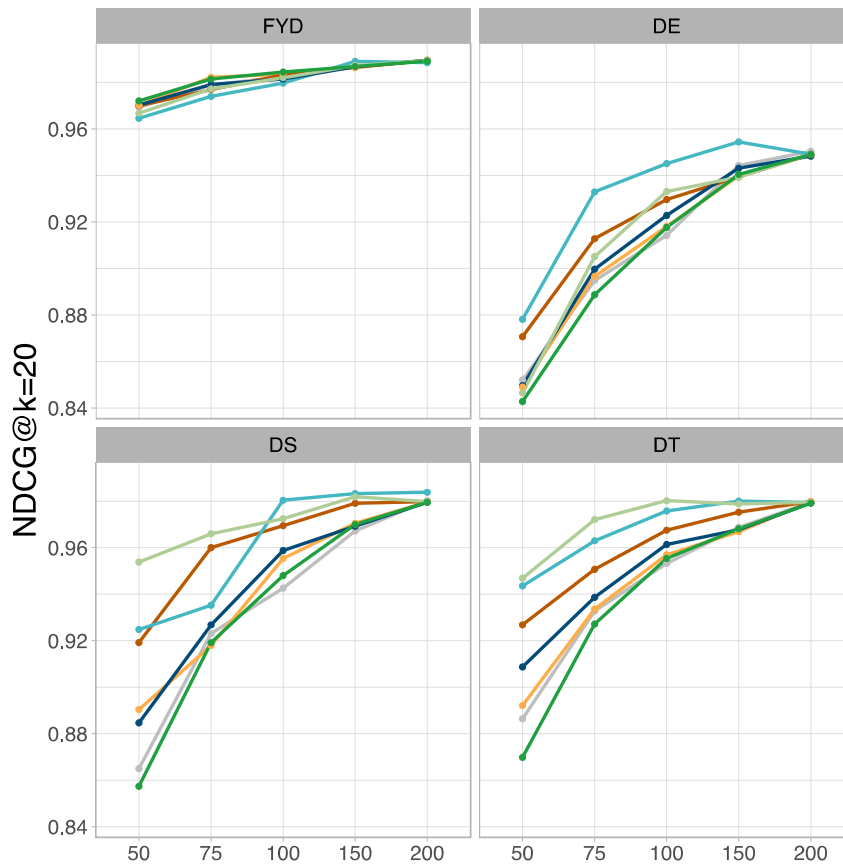
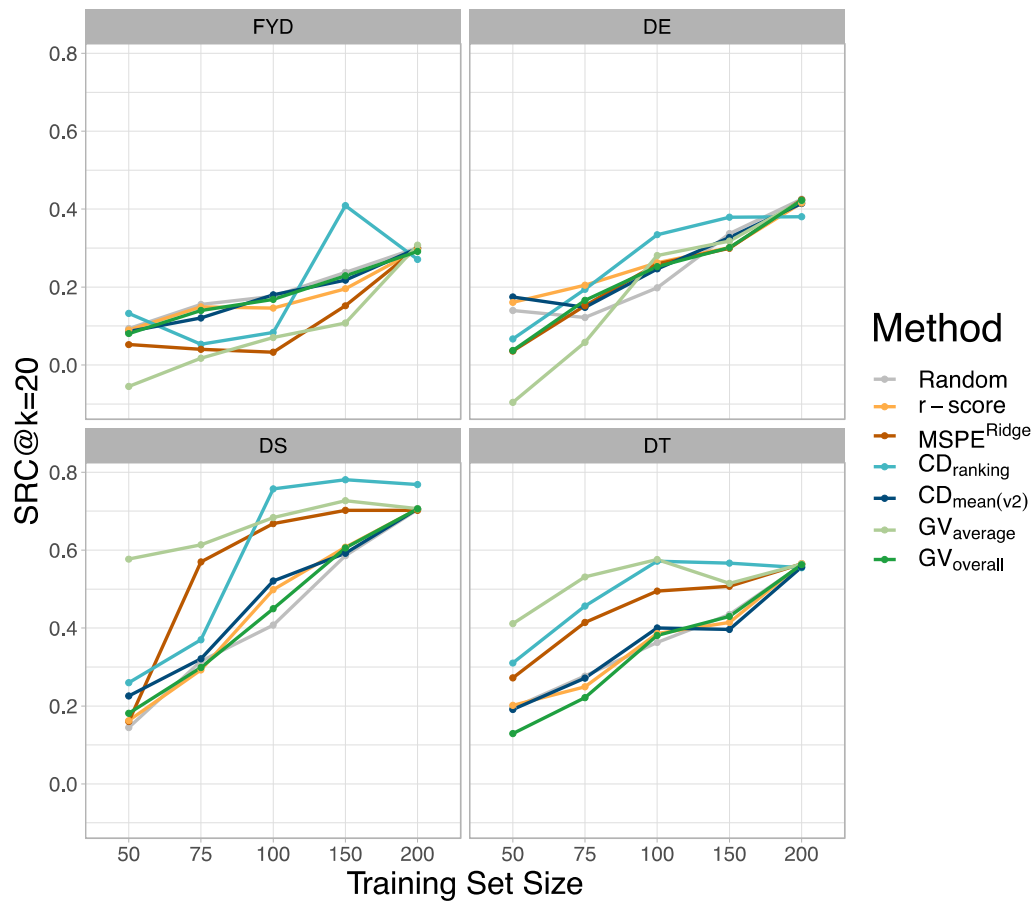


Figure S9: Averages and standard deviations of Pearson's correlation values among the best 20 genotypes over the 1000 simulated datasets using the proposed methods in the soybean dataset.

Wheat: NDCG@k=20



Wheat: SRC@k=20



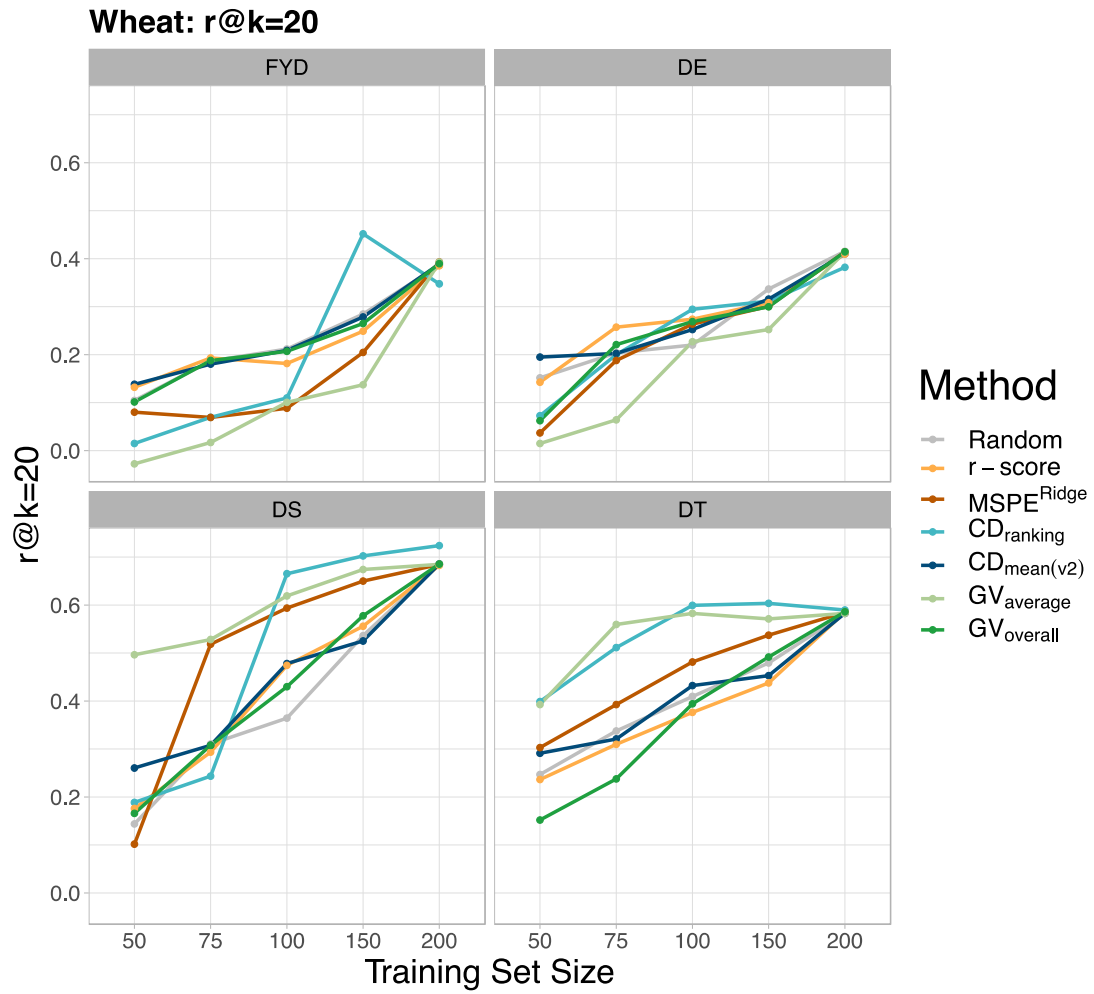


Figure S10: Averages of NDCG, SRC, and Pearson's correlation values among the top 20 genotypes over the 50 re-sampled candidate populations using the proposed methods for the real traits in the wheat dataset. FYD: flour yield; DT: dough tenacity; DE: dough extensibility; DS: dough strength.

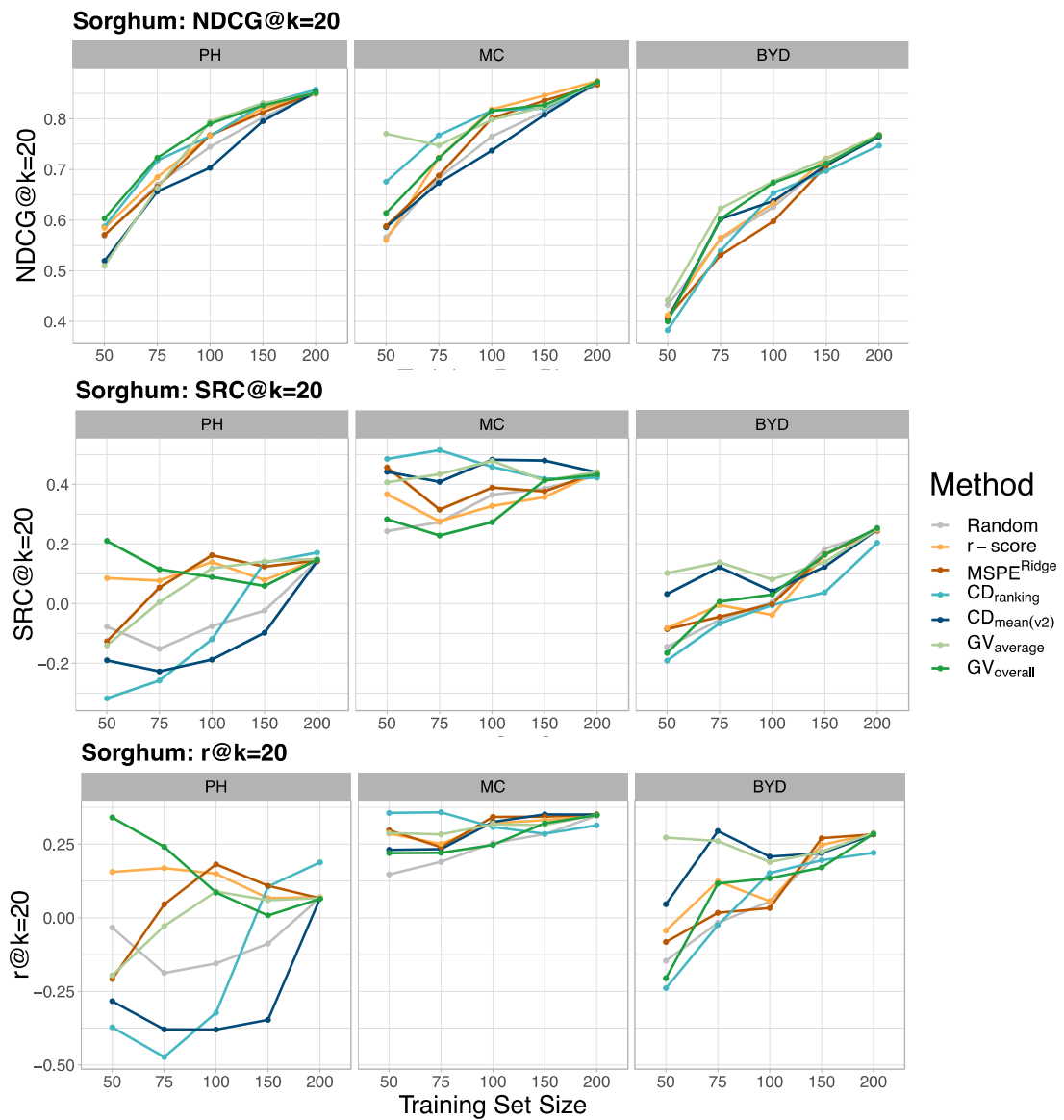


Figure S11: Averages of NDCG, SRC, and Pearson's correlation values among the top 20 genotypes over the 50 re-sampled candidate populations using the proposed methods for the real traits in the sorghum dataset. PH: plant height; MC: moisture content; BYD: biomass yield.

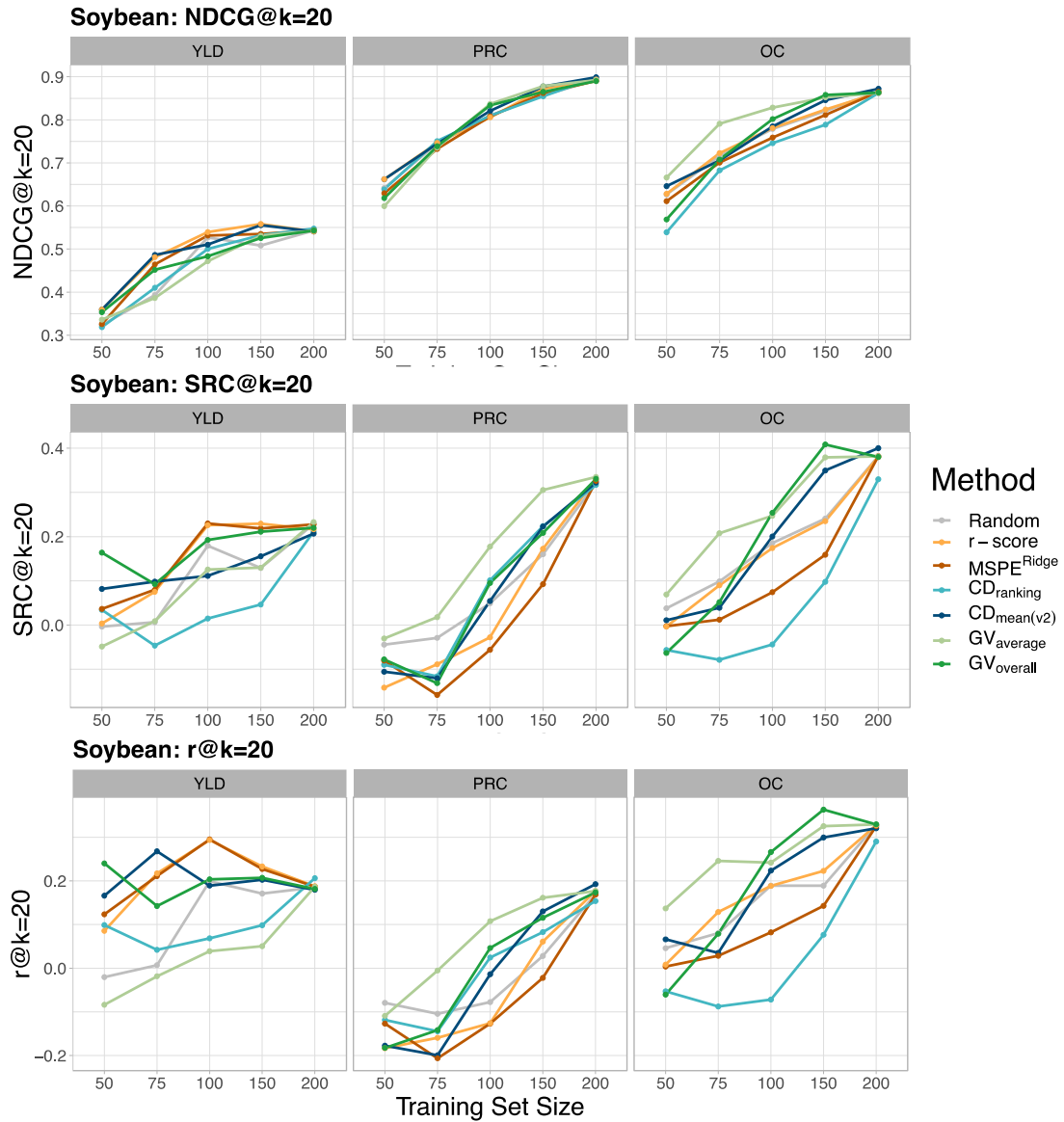


Figure S12: Averages of NDCG, SRC, and Pearson's correlation values among the top 20 genotypes over the 50 re-sampled candidate populations using the proposed methods for the real traits in the soybean dataset. YLD: yield; PRC: protein content; OC: oil content.