

(DenseNet201 & InceptionV3 & RegNetY080 & Xception & original data & CLAHE & EL) by using IDLF and EL model together



**Key words:** Ensemble learning , hybrid model, Image enhancement techniques, transfer learning , Machine learning, Deep learning

Ref.	Year	Datasets	Method used	Class number	Number of test examples	Accuracy (%)
Safarizjalal et al. (2022)	2022	Wheat Disease Detection	EfficientNet-B0	3	368	99.72
Borhani et al. (2022)	2022	Wheat Disease Detection	Model 3/ Model 4	3	737	97.00
Proposed Approach	2023	Wheat Disease Detection	(DenseNet201 (TL) + InceptionV3 (TL) + RegNetY080 (TL) + Xception (TL)) feature & Original dataset & Structured with CLAHE dataset & EL	3	720	99.72

Model	Dataset	TF*	Clf*	Class	PPV	SN	F <sub>1</sub>	Overall ACC
DenseNet201 (TL) & InceptionV3 (TL) & RegNetY080 (TL) & Xception (TL)	CLAHE	8032	EL	Healthy	0.9960	1.0000	0.9980	0.9944
				Yellow Rust	0.9957	0.9915	0.9936	
				Brown Rust	0.9915	0.9915	0.9915	
	Original + CLAHE	16064	EL	Healthy	1.0000	1.0000	1.0000	0.9972
				Yellow Rust	1.0000	0.9915	0.9957	
				Brown Rust	0.9915	1.0000	0.9957	

## Results:

**Validation Accuracy: 0.9977349943374858**

**Test Accuracy: 0.994572591587517**

