

# **Evaluation the effects of powdery mildew caused by *Blumeria graminis* f.sp. *hordei* and cultivar on the barley lodging**

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# Evaluation the effects of powdery mildew caused by *Blumeria graminis* f. sp. *hordei* and cultivar on the barley lodging

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## European Journal of Plant Pathology

Published in cooperation with the  
European Foundation for Plant Pathology

**2.224 (2021)**

Impact factor

**47 days**

Submission to first decision (Median)

**406,441 (2021)**

Downloads

**2.262 (2021)**

Five year impact factor

# Lodging

Definition:

Is a permanent bending of the stems of a crop



# Lodging losses

Lodging is not desirable:

- Uneven maturity of the crop,
- Increased moisture content of the grain,
- Decreased grain quality due to grain shriveling
- Increased harvesting costs.
- Yield reduction from 20% up to 66% is reported

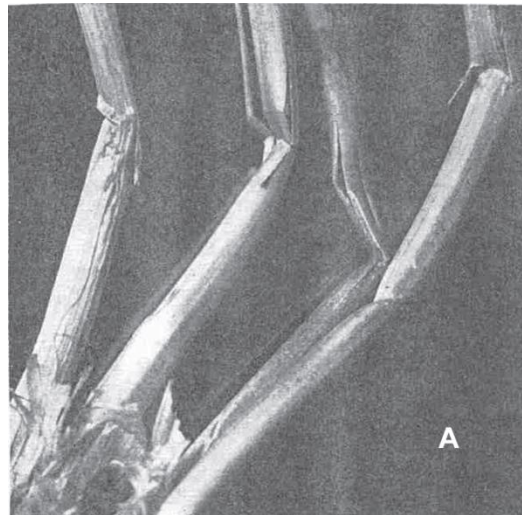
# Lodging causes

- High inputs of nitrogen fertilizer
- Water
- Limiting light penetration into the canopy
- Wind
- Rain
- Topography
- Soil type
- Variety height
- **Plant Diseases**

# Types of lodging

Two forms of lodging in cereals are known worldwide:

- Lodgings caused by stem fragility
- Lodgings caused by poor root development





# Barley powdery mildew

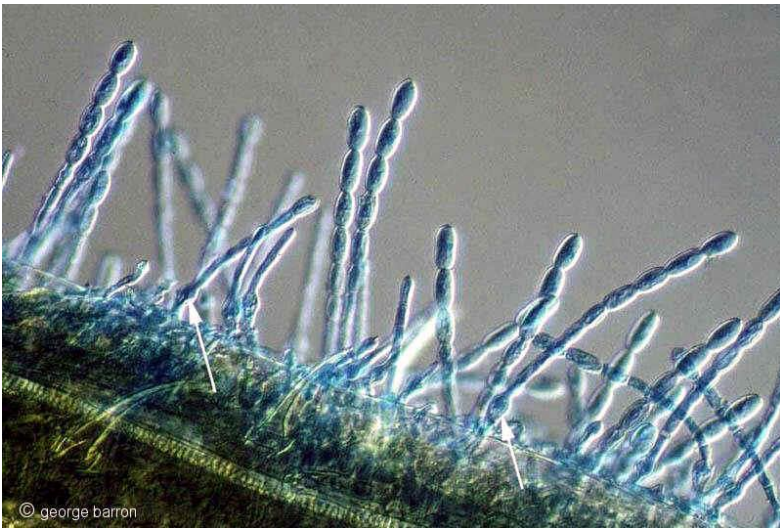
- Symptoms



# Barley powdery mildew

Cause

*Blumeria graminis* f. sp. *hordei*





# The experiment

- Location: Erbil Agriculture Research Centre (EARC)
- Duration: 2 years
- Factors: 2 (disease x cultivar)

# The experiment

- Disease factor:
  - Level A: diseased
  - Level B: non-diseased
- Cultivar factor: 4 barley cultivars
  - Tripper
  - Aksad 14
  - Two-row black
  - Two-row buhuth 1

# Lodging measurement

Belgian Lodging Scale (0.2 – 10):

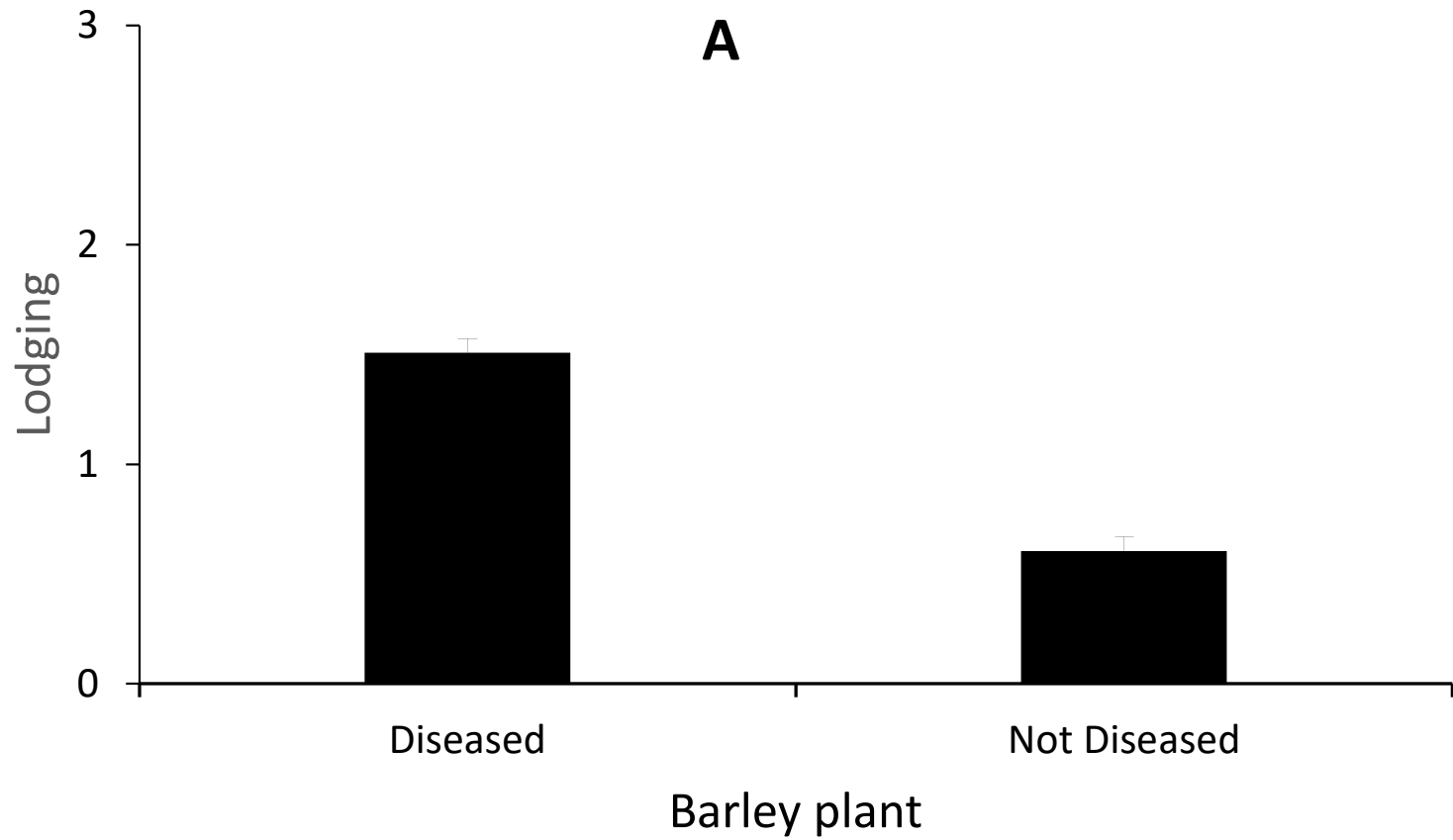
**Lodging = Area X Intensity X 0.2**

- Area = 1-10, where 1 is barley unaffected and 10 is entire plot affected
- Intensity = 1-5, where 1 is barley standing upright and 5 is barley totally flat.

# Measured parameters

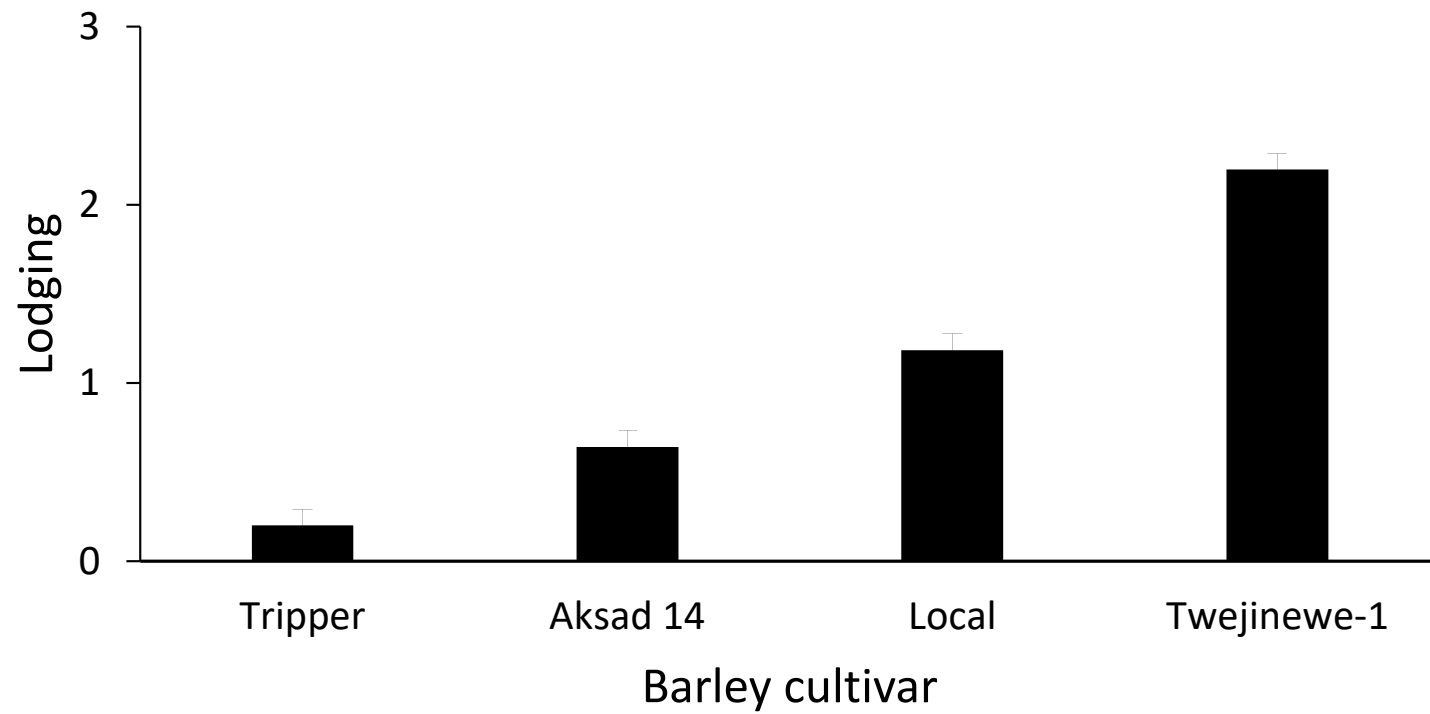
- Disease severity (using 1-9 evaluation scale)
- Lodging
- Plant height
- Biological yield
- Yield
- Weight of 1000 seed

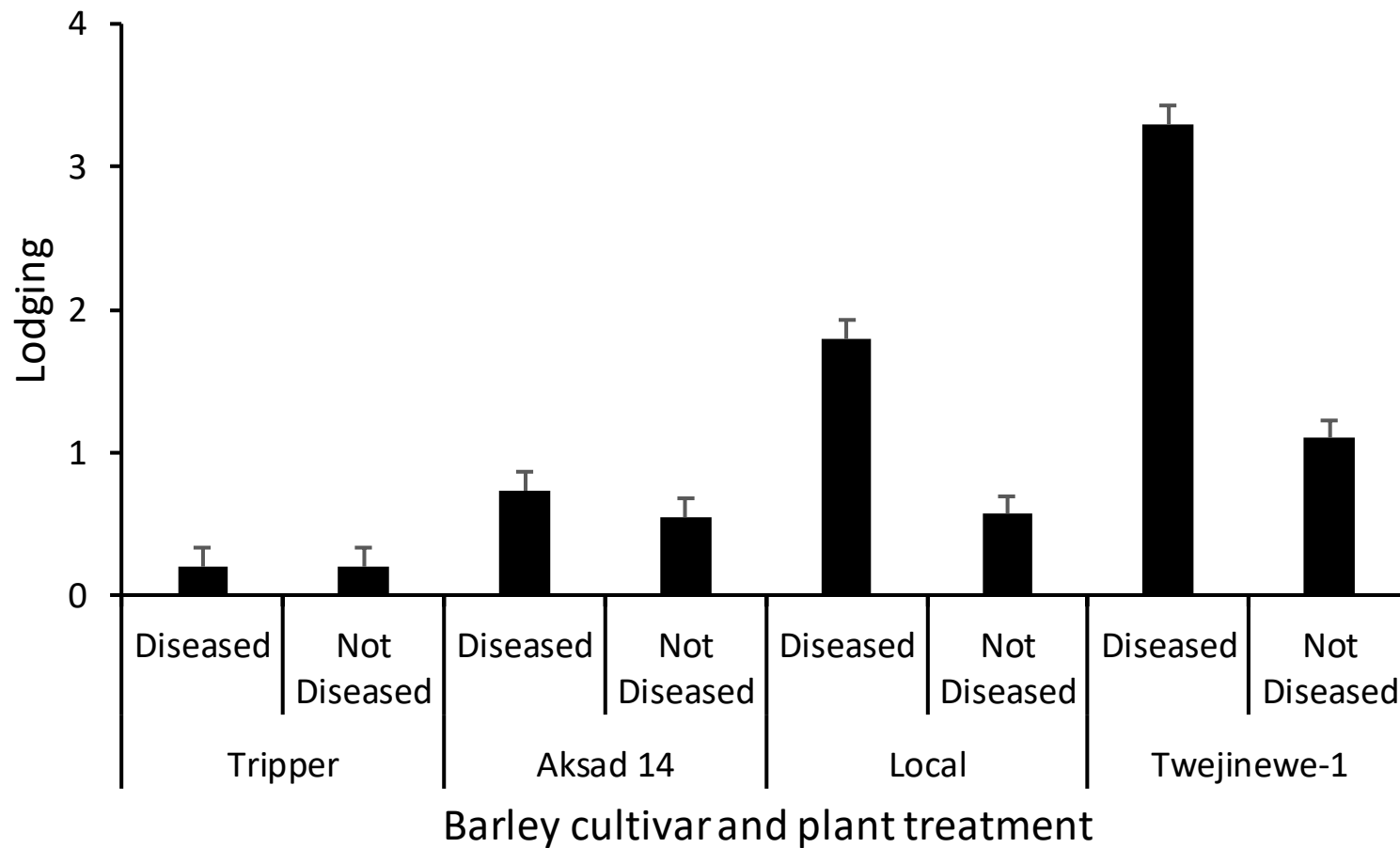
# Results



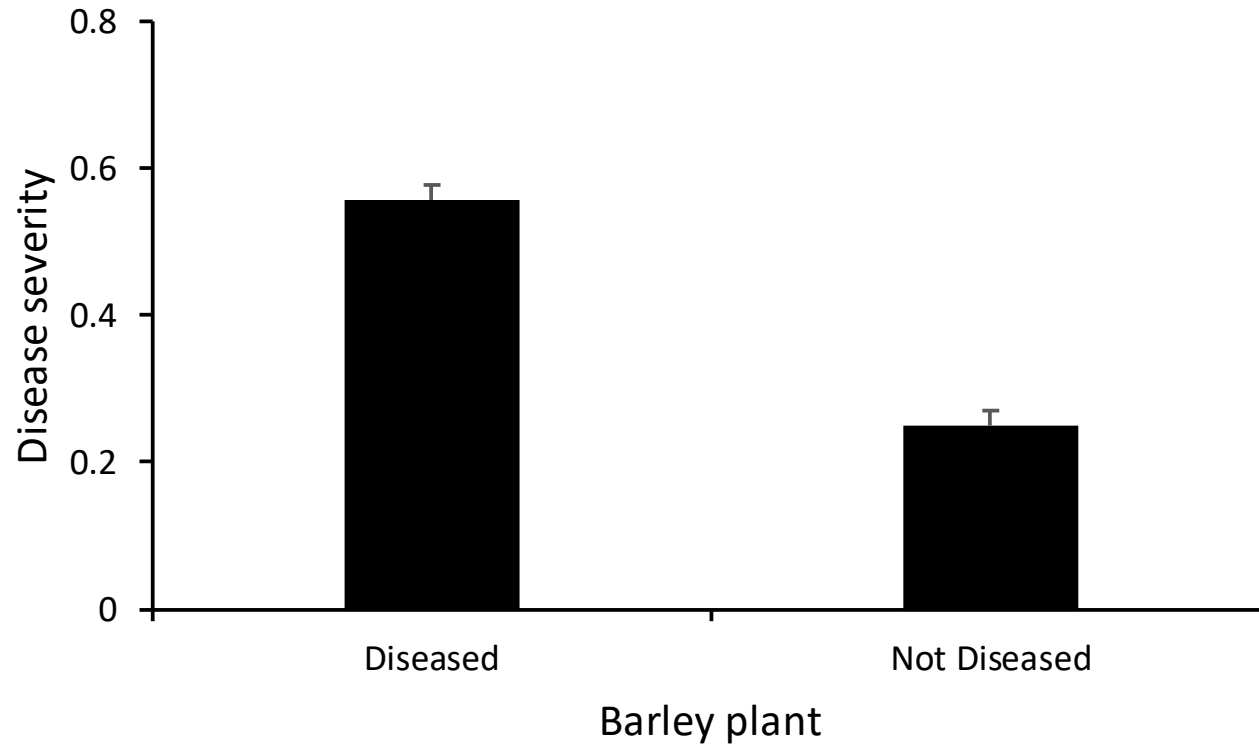


**B**

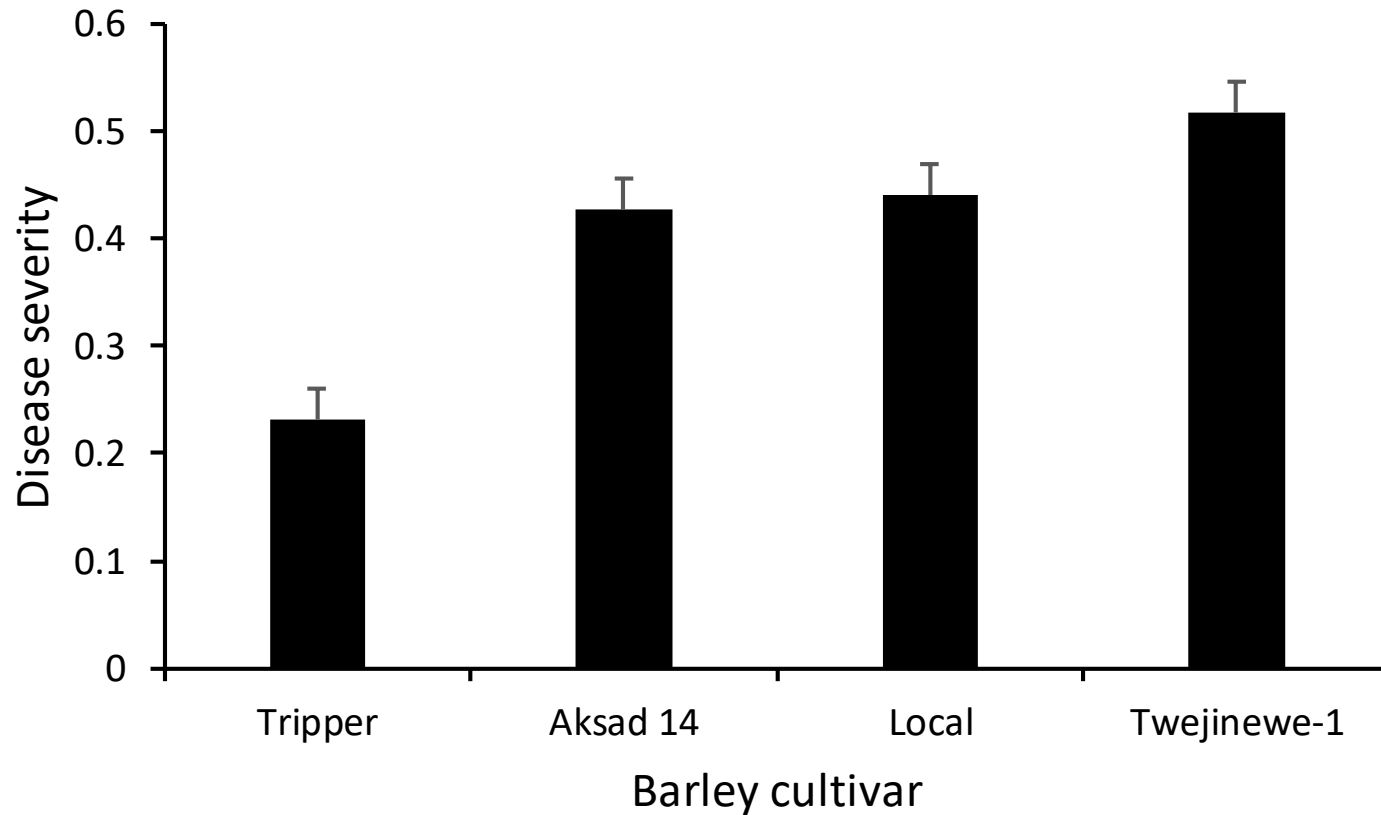




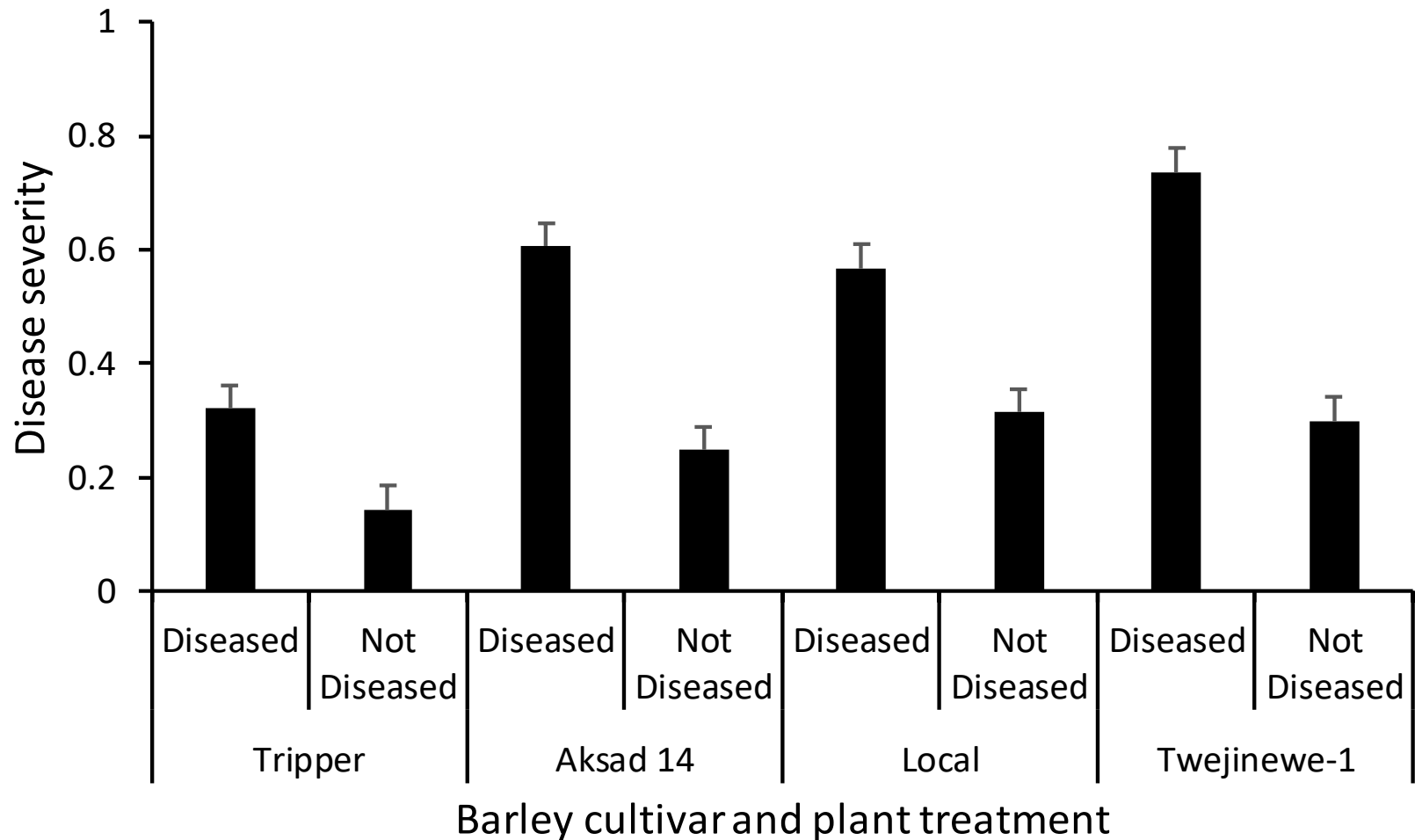
# Effect of barley cultivar and protectant fungicides on the disease severity



# Effect of protectant fungicides on the disease severity

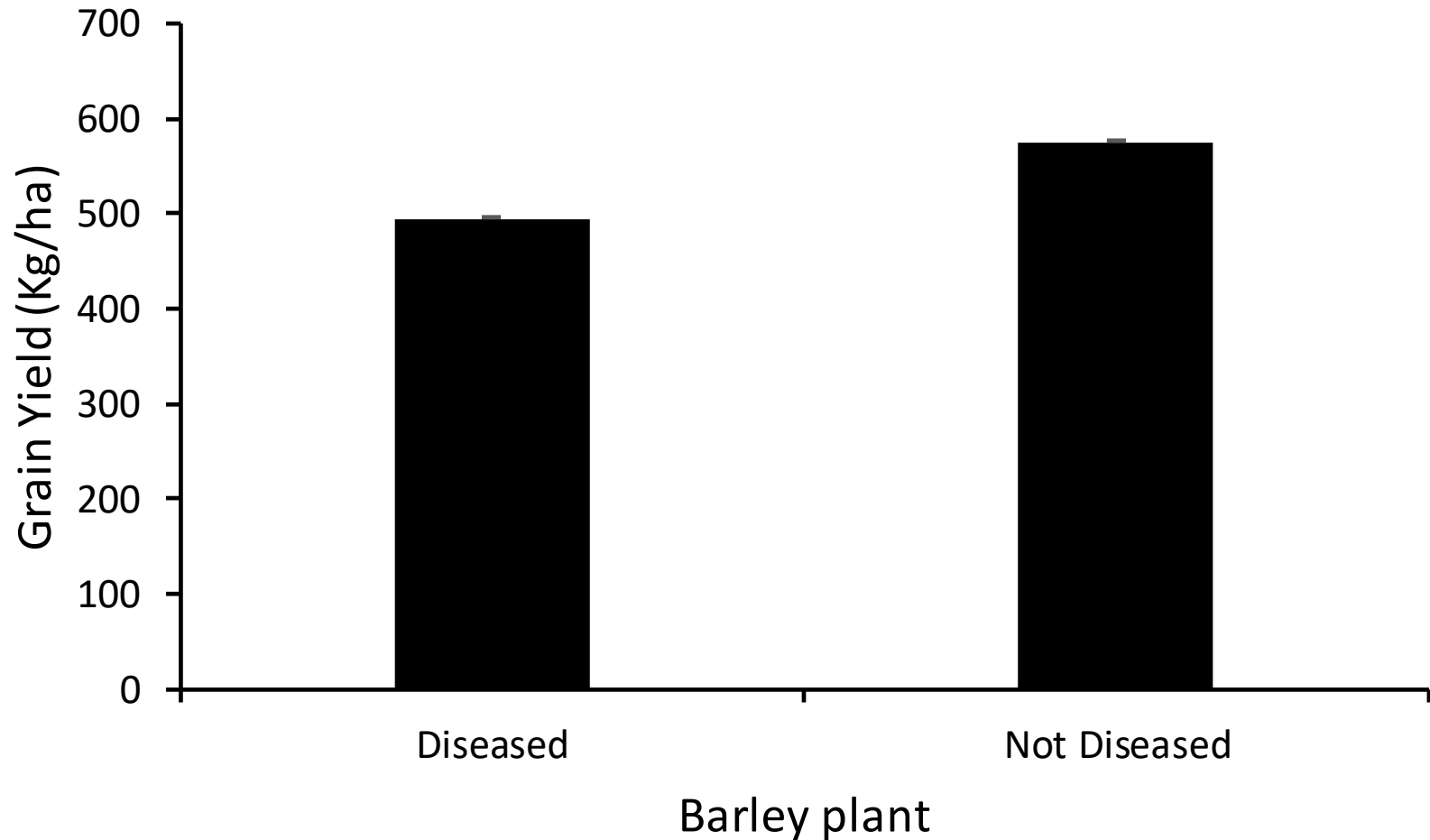


# Effect of barley cultivar and plant treatment on the disease severity

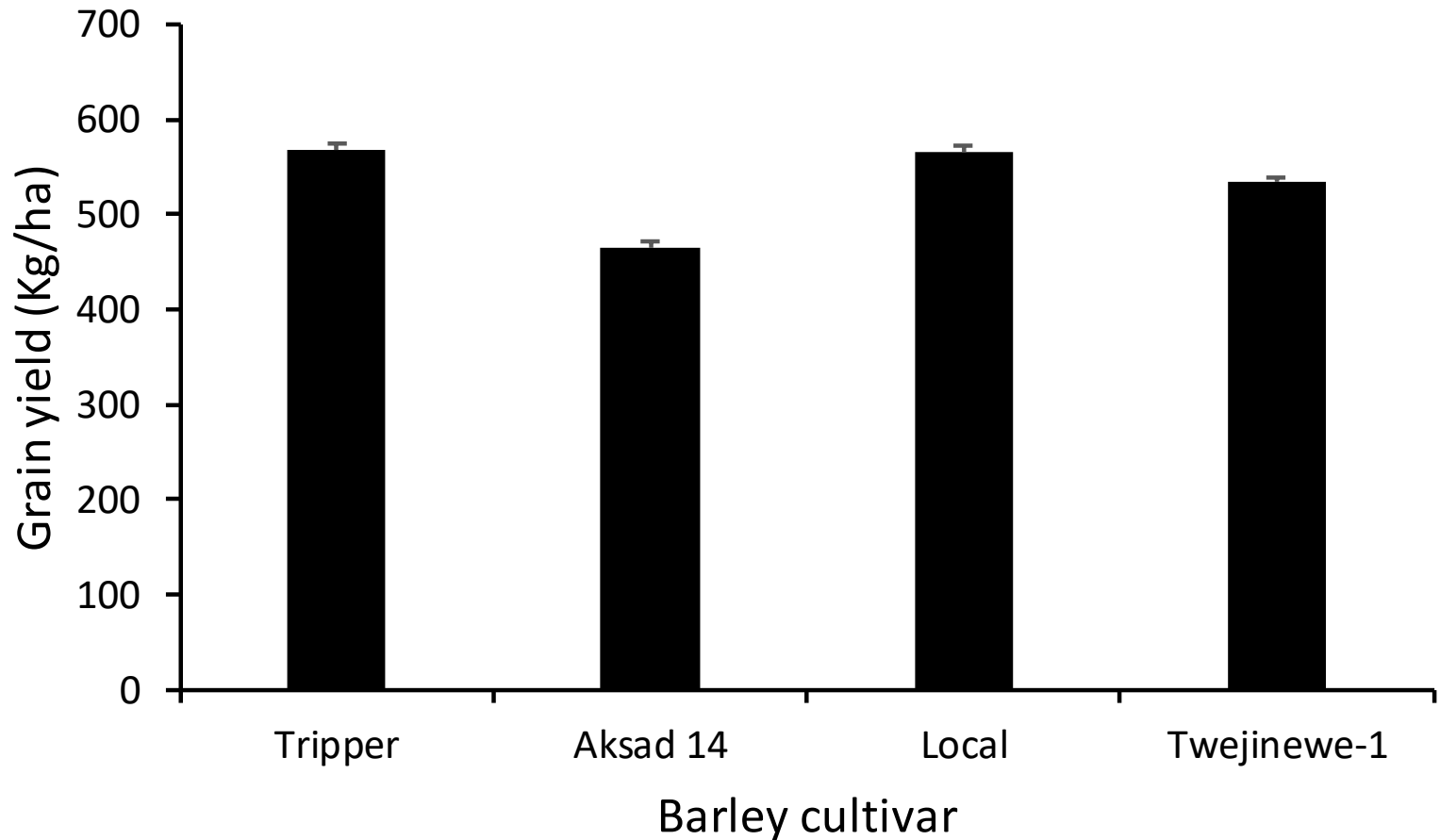




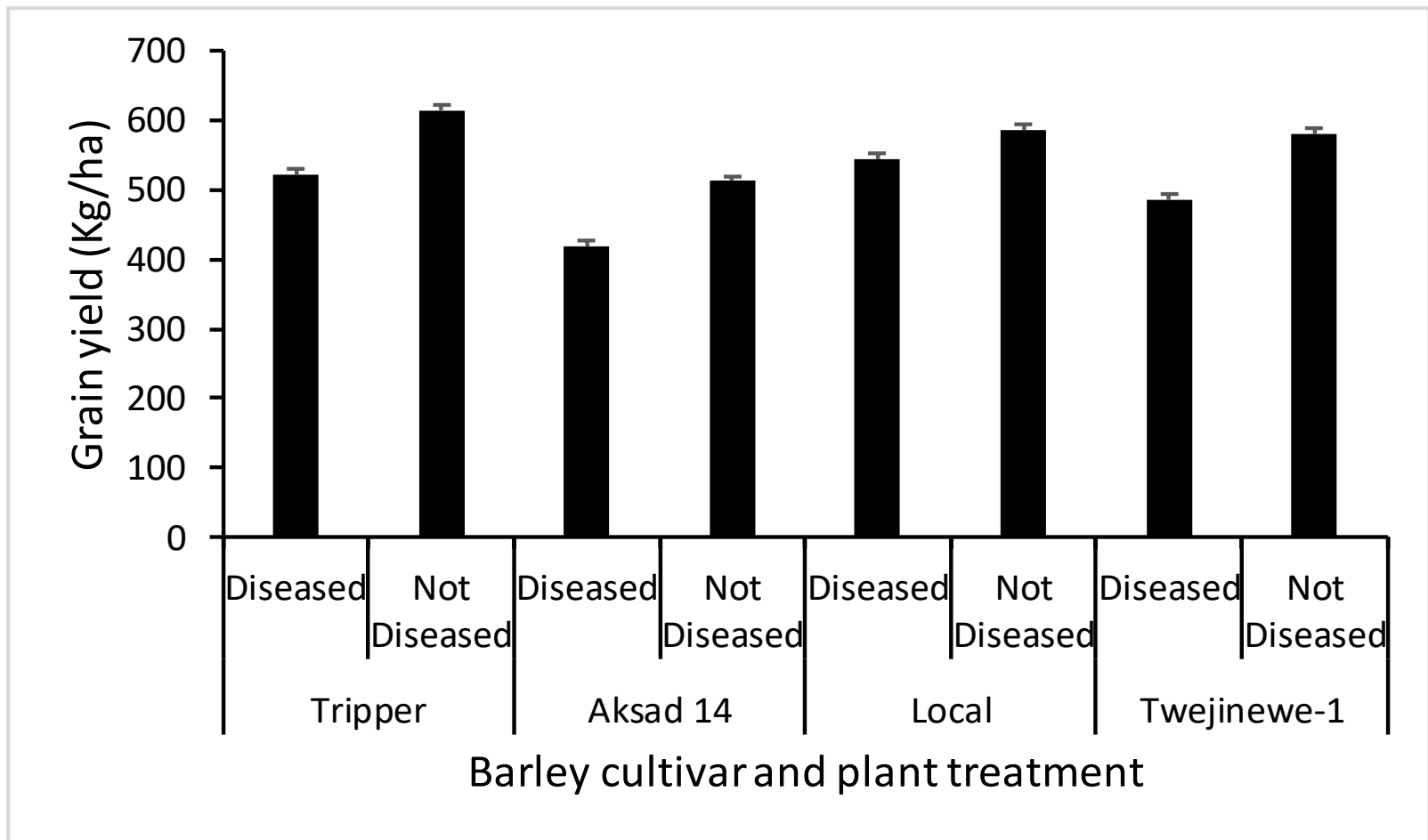
# Effect of powdery mildew on barley grain yield



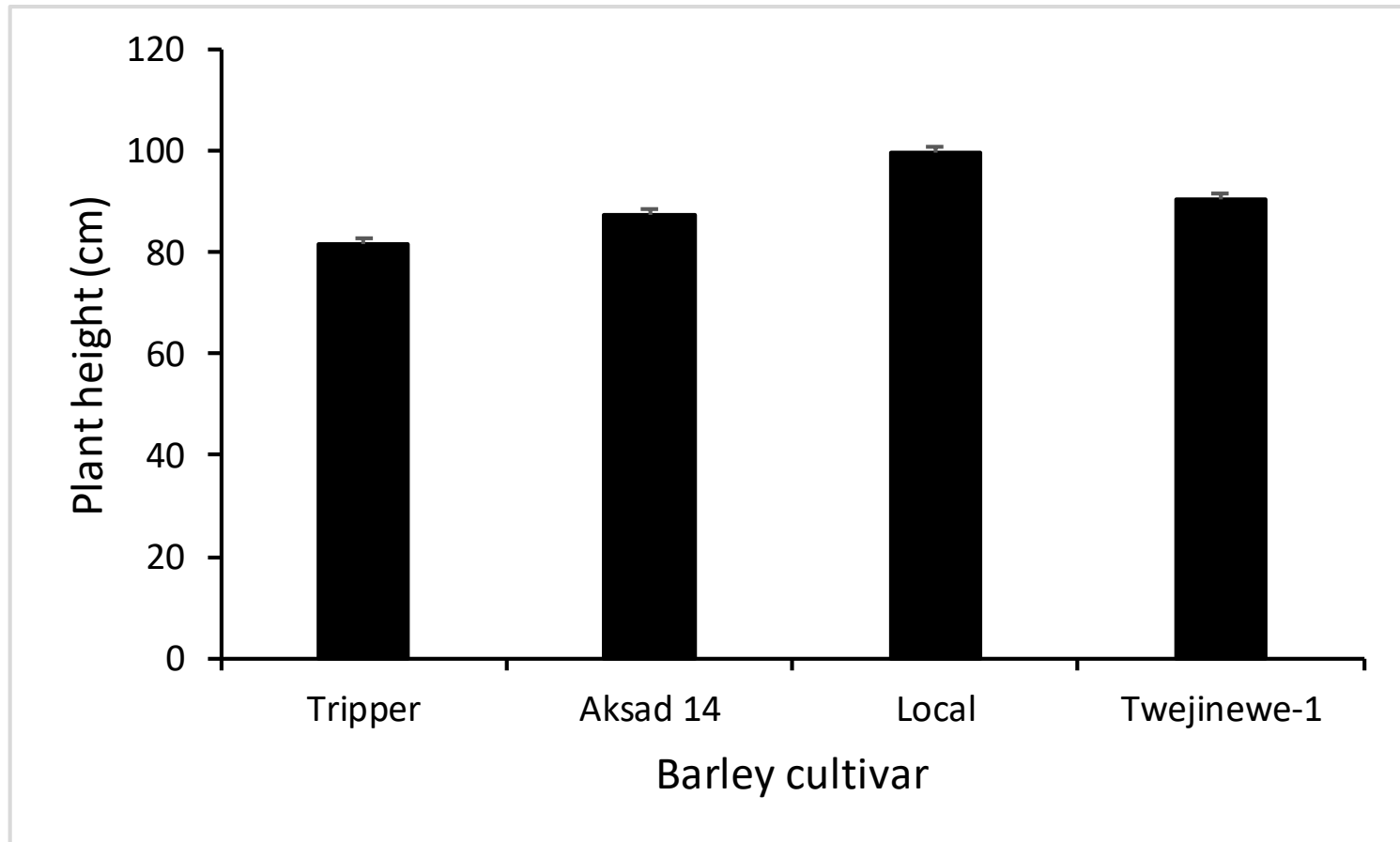
# Effect of barley cultivar on barley yield



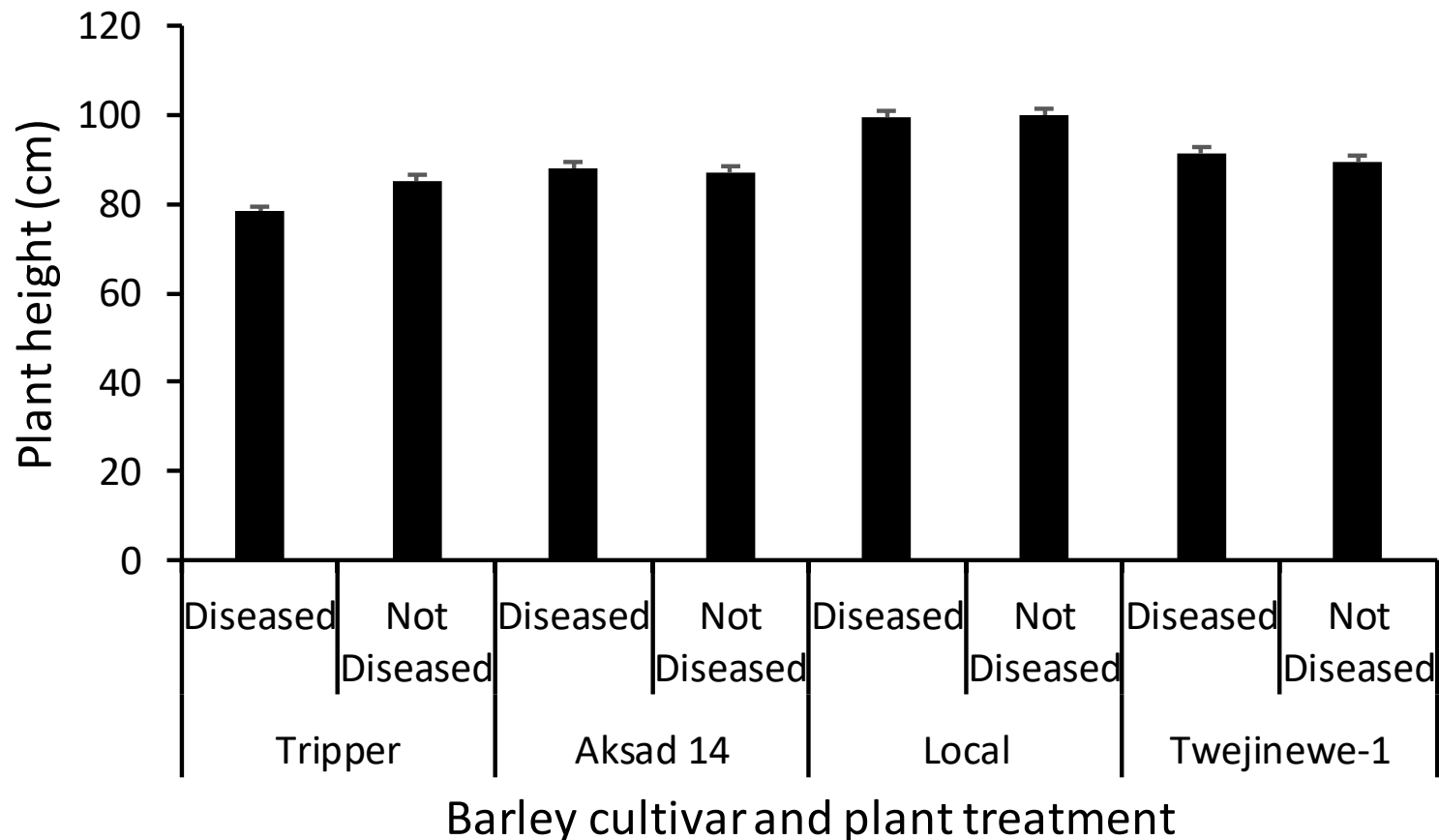
# Effect of barley cultivar and treatment on barley grain yield



# Effect of barley cultivar on the plant height

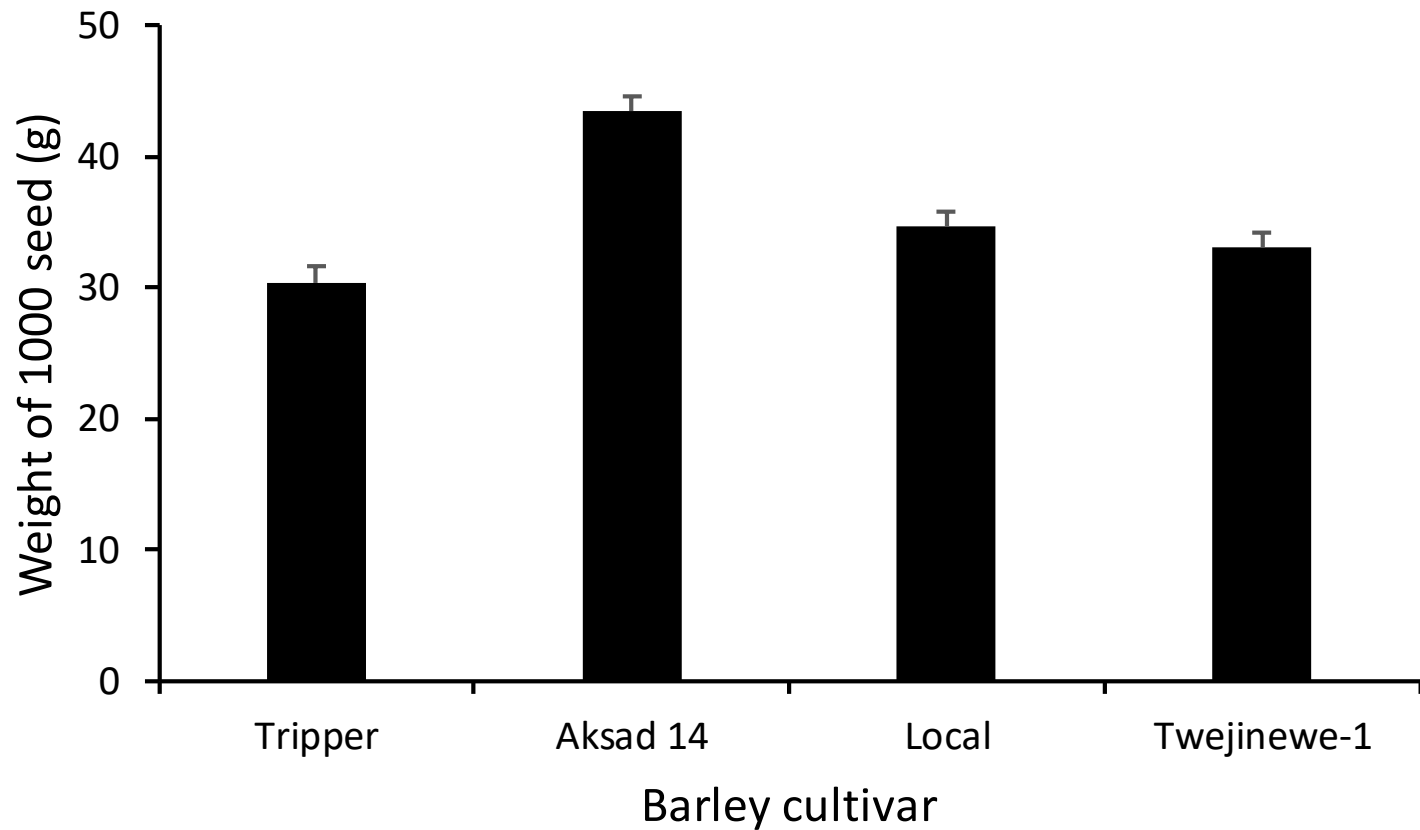


# Effect of barley cultivar and plant treatment on the barley height





# Effect of barley cultivar on the weight of 1000 barley seed



# Effect of barley cultivar on biological yield



# Conclusions

- Barley mildew disease affected barley lodging and grain yield.
- Different barley cultivars also affected lodging, yield, plant height, the weight of 1000 seeds, and biological yield.
- Barley cultivars respond differently to the barley powdery mildew.
- Alternate use of two fungicides was efficient to protect barley plants from powdery mildew disease and therefore decreased barley plant lodging and increased barley yield.
- Gathering more than one factor may cause the lodging phenomenon to barley more serious

Thank you