Fig 2.1 Wheat grains of different species

T. monococcum

T. turgidum

T. aestivum
Fig 2.2a Internal structure of wheat grain

Fig 2.2b Histological structure of wheat grain and the type of storage food in different parts of grain
Fig 2.3 Average raining, humidity and temperature during 2000-2013 at Agricultural research station Baye Kola and Mazandaran province.
Fig 2.4a  PHS in wheat cultivar Morvarid at Gorgan
Fig 2.4b  PHS in wheat cultivar N-80-19 at Behshar and Hezar Jarib
Fig 2.4c  PHS in wheat cultivars Milan and Tajan at Dodangeh and Kelar Dasht
Fig 2.5 Variation in seed coat color among wheat lines A: White, B: Light red, C: Medium red, D: Dark red
Fig 3.1a Location of Agricultural Research Station Bayekola and regions damaged by PHS (Sari, Gorgan, Gonbad, Hezarjarib, Kiasar and Kelardasht)
Fig 3.1b  Different genotypes of wheat cultivated in experimental field at Bayekola
Fig 3.2  Installation of mist irrigation in wheat field
Fig 3.3 Sprinklers used in mist irrigation

Fig 3.4 Installation pipe and sprinklers in wheat field at physiological maturity stage
Fig 3.5 Application of mist irrigation to wheat grown in field at physiological maturity stage
Fig 3.6  Yellow rust on the leaf of wheat

Fig 3.7  Fusarium on spike
Fig 3.8 Measurement of mist irrigation with rain gauge

Fig 3.9 Measurement of humidity
Fig 3.10  Recording the severity of damage and percentage of germination due to PHS

Fig 3.11 Recording of the tolerant and sensitive genotypes to PHS during 21 days of MI
Fig 3.12 Screening of PHS tolerant and sensitive wheat genotypes under MI in field

Fig 3.13 Observations on spike and grains at 7th day of MI
Fig 3.14 Observation of different wheat genotypes in experimental field

Fig 3.15 Observation of different wheat genotypes in field under MI at physiological maturity stage
Fig 3.16 Medium PHS tolerant variety of wheat under mist irrigation showing less sprouting

Fig 3.17 PHS sensitive variety of wheat under mist irrigation showing sprouting
Fig 3.18 PHS resistant wheat variety under mist irrigation without sprouting

Fig 3.19 PHS resistant wheat variety under mist irrigation showing sprouting
Fig 3.20 Highly PHS sensitive wheat variety under mist irrigation showing sprouting

Fig 3.21 PHS sensitive variety of wheat
Fig 3.23 PHS tolerant variety of wheat

Fig 3.24 PHS resistant variety of wheat
Fig 3.25  Harvesting of PHS sensitive and tolerant verities of wheat under MI

Fig 3.26  Harvesting of wheat at full maturity
Fig 3.27 Spike and grains of variety Nai60 (Local) at 21st day of MI

Fig 3.28 Spike and sprouted grains of variety N-80-19 at 21st day of MI
Fig 3.29 Spike and sprouted grains of variety N-87-12 at 21st day of MI

Fig 3.30 Spike and sprouted grains of variety N-86-12 at 21st day of MI
Fig 3.31 Spike and sprouted grains of variety N-87-8 at 21st day of MI
Fig 4.2 Curved spike and close spikelet in wheat

Fig 4.3 Open spikelet in wheat
Fig 4.4 Curved spike in wheat

Fig 4.5 Horizontal spike in wheat
Fig 4.6 Vertical spike in wheat

Fig 4.7 PHS tolerant wheat genotype MI (N-87-32) as there is no sprouting under 21 days of MI
Fig 4.8 Wheat genotype tolerant to PHS under 21 days of MI (N-87-6) as there is no reduction in kernel weight

Fig 4.9 Effect of mist irrigation on wheat genotype (N-87-13) showing lodging, sharing and sensitiveness to PHS
Fig 4.10 PHS in highly sensitive wheat genotype (N-87-19)
Fig 4.11 Changes in similarity level of different genotypes of wheat using cluster analysis

Fig 4.12 Screen plot showing eigen values in response to the number of components for the selected variables of wheat genotypes
Fig 4.13 Sprouting of grains in spike of wheat genotype to PHS sensitive (N-80-19)

Fig 4.14 PHS in highly sensitive genotype of wheat (N-87-12)
Fig 4.15 PHS in highly sensitive wheat genotype (N-87-8)

Fig 4.16 PHS tolerant wheat genotype as there is no sprouting after 21 days of MI (N-86-12)
Fig 4.17 Medium tolerant wheat genotypes (Nai 60) as there is not sprouting after 21 days of MI
Fig 4.18a Effects on grain yield (quality and quantity) in PHS sensitive wheat genotypes (N-87-8).

Fig 4.18b Effects on grain yield (quality and quantity) in PHS sensitive wheat genotypes (N-87-12)
Fig. 4.19  Relationship between carbohydrates and days after MI in five wheat genotypes.

Fig. 4.20 Relationship between starch values and days after MI in five wheat genotypes.
Fig 4.21 Relationship between sugar contents and days after MI in five wheat genotypes. Lines were fitted according to the regression models.

Fig 4.22 Relationship between proline and days after MI in five wheat genotypes.
Fig 4.23 Relationship between phenol and days after MI in five wheat genotypes.

Fig 4.24 Linear regression between MI x Yield in five genotypes of wheat
Fig 4.25 Linear regression between MI × Protein in five genotypes of wheat

Fig 4.26 Linear regression between MI × α-amylase in five genotypes of wheat
Fig 4.27 Linear regression between MI × β-amylase in five genotypes of wheat

Fig 4.28 Linear regression between MI × total amylase in five genotypes of wheat
Fig 4.29 Mean comparison of different stages in expression levels of α-amylase activity during eight days of PHS

<table>
<thead>
<tr>
<th>Stage</th>
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<tbody>
<tr>
<td>Stage 1</td>
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<tr>
<td>Stage 4</td>
<td>21.01</td>
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</tbody>
</table>

Fig 4.30 Relative gene expression of α-amylase and beta actin in five wheat genotypes
CT = -0.802 log (concentration) +18.73

Fig 4.31 Determination index R2 fit linear regression for Serial dilutions
Fig 3.22 Recording of sprinkler irrigation in experimental field