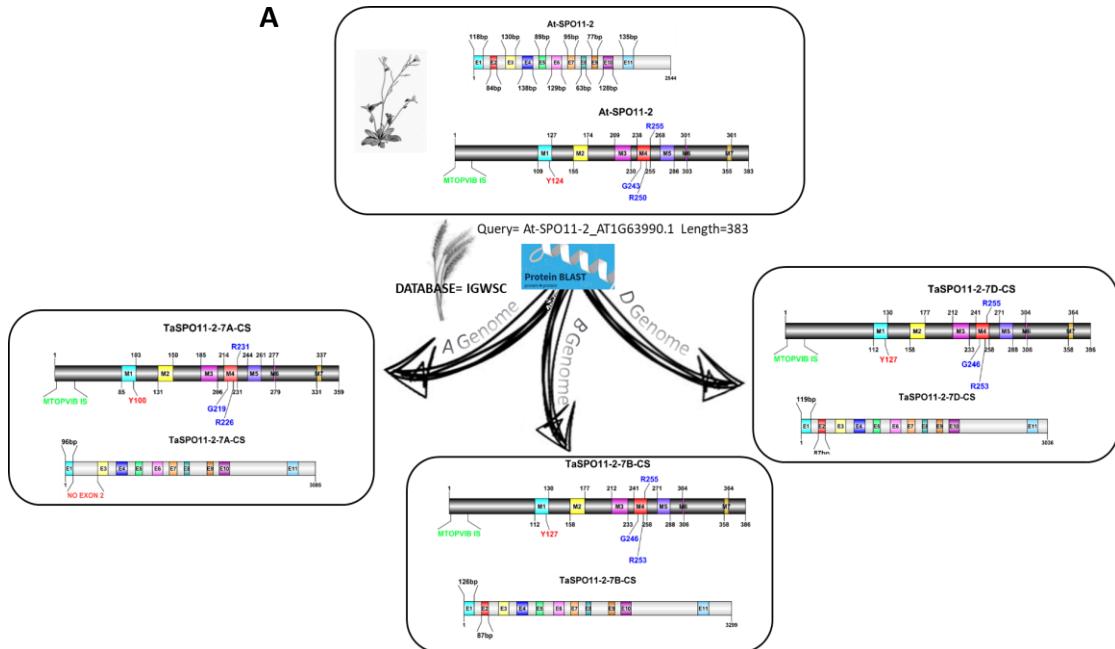


Figure 1



**B**



**C**

CLUSTAL format alignment by MAFFT (v7.452)

The alignment shows the sequence variations across four wheat genes (TaSPO11-2-7A-CS, TaSPO11-2-7B-CS, TaSPO11-2-7D-CS, and TaSPO11-2A-CS). The alignment is color-coded to highlight specific regions:

- EXON1:** Labeled above the first set of sequences. It includes a green box around the first 100 bp and a red box around the 120-130 bp region.
- EXON2:** Labeled above the second set of sequences. It includes a red box around the 120-130 bp region and a blue oval highlighting a insertion/deletion event in the 3206 bp variant.
- EXON3:** Labeled above the third set of sequences. It includes a red box around the 120-130 bp region.
- EXON4:** Labeled above the fourth set of sequences. It includes a red box around the 120-130 bp region.

Key mutations and insertions are indicated by asterisks (\*), double asterisks (\*\*), and triple asterisks (\*\*\*\*). The alignment highlights differences in exon 2 and exon 3 across the variants.

Figure 2

A

EXON2

```

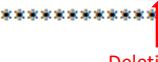
TaSP011-2-7A-CS catagggtcgggcaaggatcgagggtggcggtgctcaatttcctgcggcgctctcg
TaSP011-2-7A-RE catagggtcgggcaaggatcgagggtggcggtgctcaatttcctgcggcgctctcg
TaSP011-2-7A-AP catagggtcgggcaaggatcgagggtggcggtgctcaatttcctgcggcgctctcg
TaSP011-2-7A-AR catagggtcgggcaaggatcgagggtggcggtgctcaatttcctgcggcgctctcg
TaSP011-2-7A-W7 catagggtcgggcaaggatcgagggtggcggtgctcaatttcctgcggcgctctcg
*****
```

EXON2

```

TaSP011-2-7A-CS cctttctccggatctgtcctcccccgttacgcccgtccacaaacccataccctcc
TaSP011-2-7A-RE cctttctccggatctgtcctcccccgttacgcccgtccacaaacccataccctcc
TaSP011-2-7A-AP cctttctccggatctgtcctcccccgttacgcccgtccacaaacccataccctcc
TaSP011-2-7A-AR cctttctccggatctgtcctcccccgttacgcccgtccacaaacccataccctcc
TaSP011-2-7A-W7 cctttctccggatctgtcctcccccgttacgcccgtccacaaacccataccctcc
*****
```

Deletion-site



B

EXON2

```

TuSP011-2-G1812 --cgccccctgcctctgatcg-aatcgacatgcttgcttcctccatagggttcggcaag
TtSP011-2-7A-Za --cgccccctgcctctgatcg-aatcgacatgcttgcttcctccatagggttcggcaag
TaSP011-2-7A-CS --cgccccctgcctctgatcg-aatcgacatgcttgcttcctccatagggttcggcaag
TtSP011-2-7B-Za --cgccccctgcctctgatcg-aatcgacatgcttgcttcctcgatagggttcggcaag
TaSP011-2-7B-CS --cgccccctgcctctgatcg-aatcgacatgcttgcttcctcgatagggttcggcaag
AetSP011-2-St --cgccccctgcctctgatcg-aatcgacatgcttgcttcctcgatagggttcggcaag
TaSP011-2-7D-CS --cgccccctgcctctgatcg-aatcgacatgcttgcttcctcgatagggttcggcaag
At-SP011-2 gaatctcgtagttctgactgaaatcgaaagctcggtt-----acaggctcgtag
*.**.*.*****..* * ***.* * .***.*** *** **
```

EXON2

```

TuSP011-2-G1812 gatcgagggtggcggtgctcaatttcctgcggcgctctcgatccctttccggcat
TtSP011-2-7A-Za gatcgagggtggcggtgctcaatttcctgcggcgctctcgatccctttccgg--at
TaSP011-2-7A-CS gatcgagggtggcggtgctcaatttcctgcggcgctctcgatccctttccgg--at
TtSP011-2-7B-Za gatcgagggtggcggtgctcaatttcctgcggcgctctcgatccctttccggccat
TaSP011-2-7B-CS gatcgagggtggcggtgctcaatttcctgcggcgctctcgatccctttccggccat
AetSP011-2-St gatcgagggtggcggtgctcaatttcctgcggccacgctctcgatccctttccggccat
TaSP011-2-7D-CS gatcgagggtggcggtgctcaatttcctgcggccacgctctcgatccctttccggccat
At-SP011-2 aatcgaaagttctgttcaatctccctcgaa---tttgaactccccagatcccgat
.*****.** * * ****.***** . *.*. * ..**. * ***.* *** **
```

Deletion-site

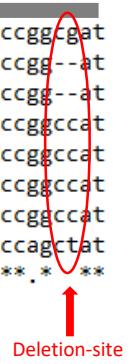


Figure 3

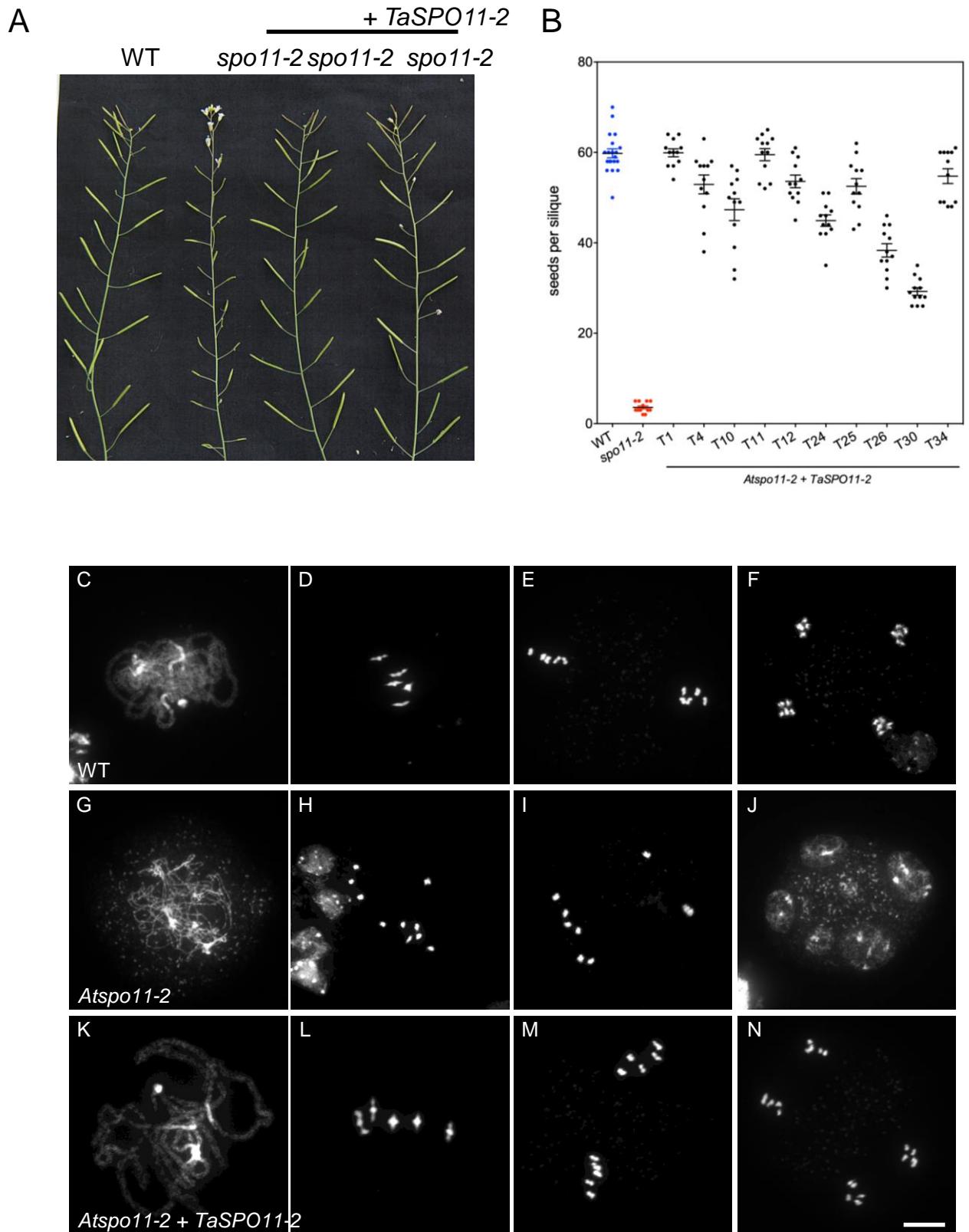


Figure 4

A



B

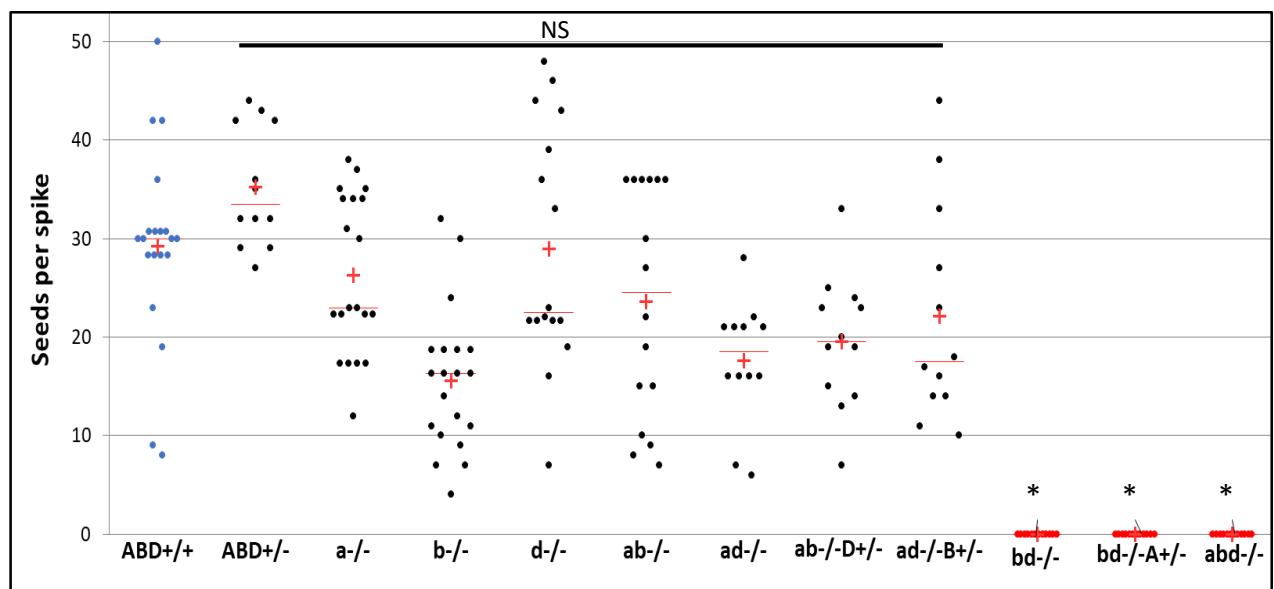
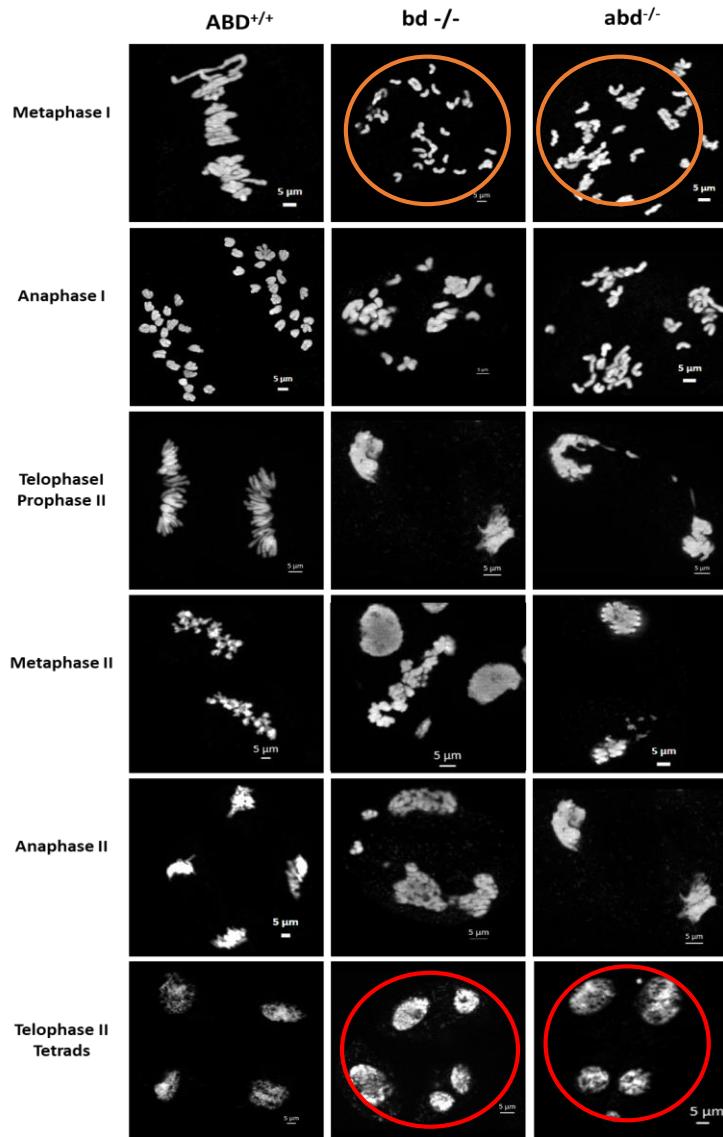


Figure 5

A



B

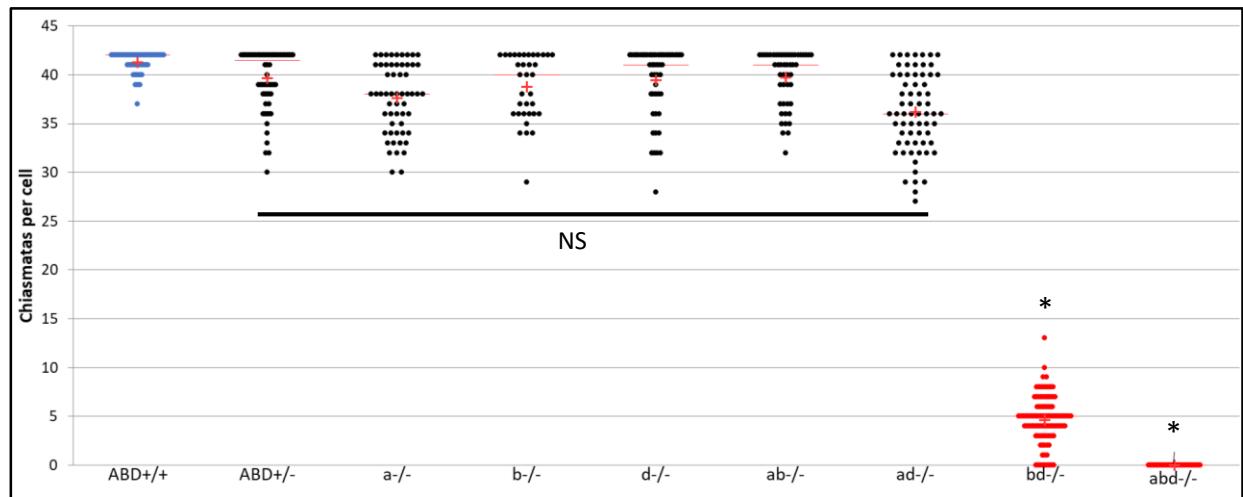


Figure 6

