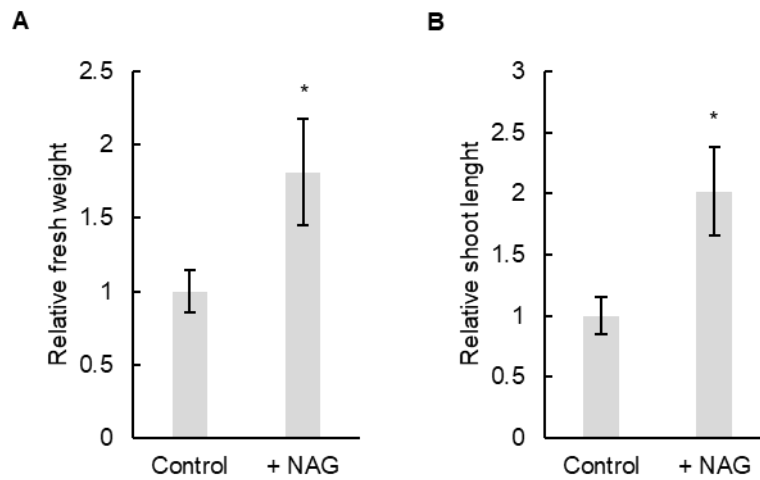


**Supplementary Figure S1 N-acetylglutamic acid represses the induction of cell death upon oxidative stress in hop**

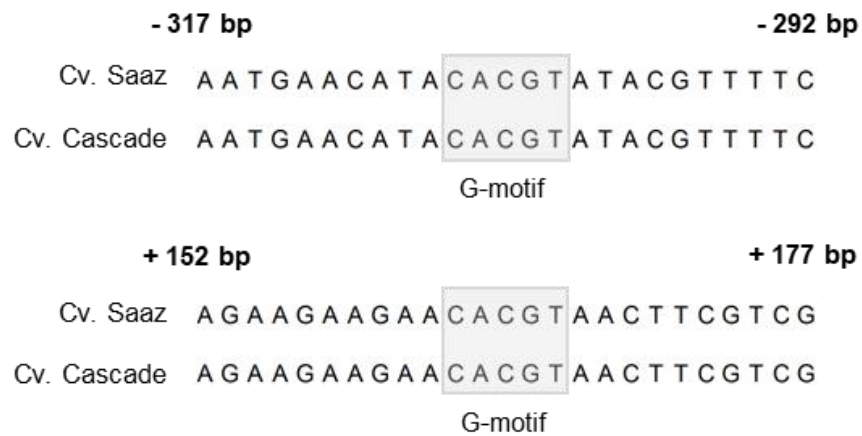
Trypan blue staining for the detection of dead cells in leaves of hop treated with 0.5 mM NAG for 24 h, with or without 5  $\mu$ M MV for 24 h. Three dependent experiments were conducted. Scale bar: 0.5 cm.



**Supplementary Figure S2. N-acetylglutamic acid (NAG) confers heat tolerance in the cultivar ‘Hersbrucker’**

(A) Fresh weight of the aerial parts of plants treated with 0.5 mM NAG for 7 days under prolonged heat stress (30°C, 28 days). The fresh weight of the NAG-treated plants was determined relative to that of the non-NAG-treated plants. Error bars indicate the standard error.  $n = 16$ .  $*P < 0.05$

(Student’s *t*-test). (B) Shoot length of plants treated with 0.5 mM NAG for 7 days under prolonged heat stress (30°C, 28 days). The fresh weight of the NAG-treated plants was determined relative to that of the non-treated plants. Error bars indicate the standard error.  $n = 14$ –19.  $*P < 0.05$  (Student’s *t*-test).



**Supplementary Figure S3 The *cis*-elements G-motifs are present in the promoter and exon regions of *HHSEF2* in the cultivars 'Saaz' and 'Cascade'**

The G-box motifs (5' -CACGT-3' ) are present in the promoter region (from -317 bp to -292 bp) and the first exon region (from +152 bp to +177 bp) of *HHSEF2*.