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A view on the role of metabolites in enhanced stem reserves remobilization in wheat under drought during grain filling

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Supplementary Table 1. Weight of main stem peduncle of wheat genotypes subjected to well-watered and drought treatments at different dates after anthesis.

Moisture treatment, Genotype & Date after anthesis	Weight of Peduncle (mg)			
	NO.14		NO.49	
	Well-watered	Droughted	Well-watered	Droughted
0 DAA ¶	205.5 d §	205.5 d	228.5 abc	228.5 abc
10 DAA	230.4 bc	234.1 bc	244.2 ab	248.3 a
20 DAA	270.7 a	244.8 b	231.7 abc	219.0 b
30 DAA	218.2 cd	207.6 d	224.4 bc	173.0 c

§ In each section, means followed by different letters within the same column indicate statistical significance at $P<0.05$ level; ¶ Days after anthesis

Supplementary Table 2. The changing pattern of different amino acids concentration in peduncle internode during grain filling in NO.49 genotype under drought and well-watered conditions.

Amino acids	Well-watered NO.49				Droughted NO.49			
(nmol / g FW)	0	10	20	30	0	10	20	30
Aspartic acid	1723 b	2831 ab	3330 a	2219 ab	1723 b	1960 b	2654 ab	1970 b
Glutamic acid	4215 bcd	5177 ab	6483 a	4601 bc	4215 bcd	3115 d	4082 bcd	3649 cd
Serine	3950 b	6052 a	3850 b	1867 c	3950 b	4812 b	4424 b	2494 c
Aspargine	945.7 cd	2071 b	1505 bc	732.7 d	945.7 cd	1755 b	2921 a	3439 a
Glycine	216 c	213.7 c	330.7 b	236.3 c	216 c	353 b	336 b	473.3 a
Glutamine	5812 a	6054 a	1897 c	2222 c	5812 a	5887 a	3157 bc	4105 b
Histidine	218.7 e	352 cde	419.3 cd	234.3 de	218.7 e	441.7 c	779 b	994.7 a
Threonine	1053 bc	1275 ab	893 c	776.3 c	1053 bc	1514 a	896.3 c	853 c
Arginine	945.7 cd	2071 b	1505 bc	732.7 d	945.7 cd	1755 b	2921 a	3439 a
Alanine	1330 bc	1923 a	1138 c	1095 c	1330 bc	1640 ab	1113 c	1057 c
γ - Aminobutiric acid	128 ab	253.3 a	61.33 b	68.33 b	128 ab	140.3 ab	95.33 b	87.67 b
ACC	45.67 a	22.67 b	17.67 b	11.67 b	45.67 a	60.33 a	20.67 b	20.67 b
Proline	8457 c	9074 c	4562 d	2194 d	8457 c	21880 a	14440 b	9219 c
Tyrosine	104.7 de	89.67 e	161 c	331.3 b	104.7 de	122.3 cde	141.3 cd	615.3 a
Valine	766.3 c	870.7 c	442 d	930.7 c	766.3 c	1813 a	711.3 cd	1421 b
Methionine	12.33 ab	17.67 ab	11.33 ab	7.33 b	12.33 ab	21.33 a	16.33 ab	19 a
Isoleucine	397.3 bc	483.7 b	268.7 c	472 b	397.3 bc	906.3 a	244.7 c	563 b
Lysine	336.7 d	648 b	554.7 bcd	420 cd	336.7 d	575.7 bc	657.7 bc	1134 a
Leucine	319 cd	352 bc	228 d	364.3 abc	319 cd	465.7 a	232.7 d	426.7 ab
Phenylalanine	89.67 d	91.33 d	225.3 cd	502.7 b	89.67 d	180.3 cd	289.3 c	1269 a
Total amino acid	33810 c	45730 ab	32040 c	21010 d	33810 c	53360 a	44340 b	38850 bc

***** Amounts which are indicated in grey color, indicated the greatest concentration during different times after anthesis.
* Amino acids which are determined with red color indicate amino acids that had significant different in the changes process of concentration between normal and stress conditions.

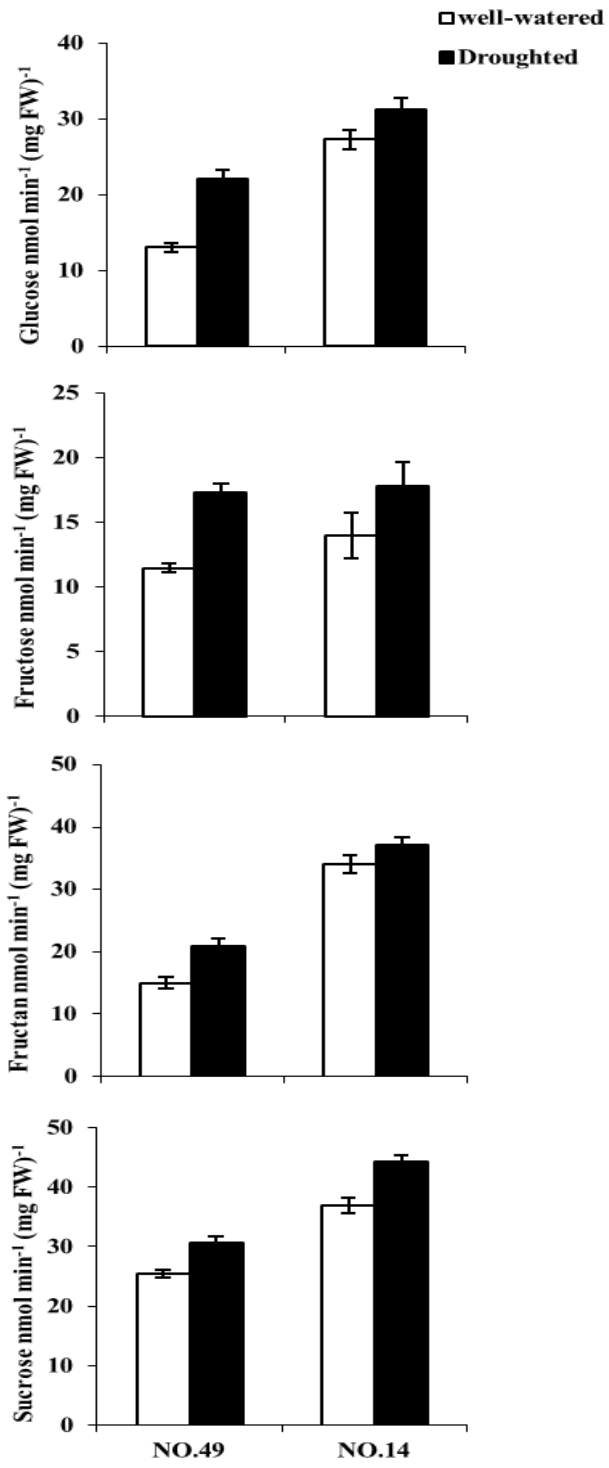
Supplementary Table 3. The changing pattern of different amino acids concentration in peduncle internode during grain filling in NO.14 genotype under drought and well-watered conditions.

Amino acids (nmol / g FW)	Well-watered **NO.14**				Droughted **NO.14**			
	0	**10**	**20**	**30**	**0**	**10**	**20**	**30**
Aspartic acid	2198 ab	2475 a	2214 ab	1839 bc	2198 ab	2176 ab	2205 ab	1343 c
Glutamic acid	4965 a	5026 a	4484 ab	3813 b	4965 a	4426 ab	4562 ab	3561 b
Serine	3629 b	5232 a	3287 b	2041 c	3629 b	5566 a	3999 b	1794 c
Aspargine	284.3 d	792.3 b	405.3 cd	256.3 d	284.3 d	979.7 a	472.3 c	304.7 cd
Glycine	239.7 b	202.7 b	216 b	203.7 b	239.7 b	335.7 ab	288 b	468 a
Glutamine	4394 b	6953 a	1930 c	2028 c	4394 b	5693 ab	2592 c	2312 c
Histidine	107.3 c	192 b	103.3 c	83.67 c	107.3 c	450 a	185 b	146 bc
Threonine	906.7 c	1199 b	640.7 de	497.7 e	906.7 c	1605 a	744 cd	666 de
Arginine	284.3 d	792.3 b	405.3 cd	256.3 d	284.3 d	979.7 a	472.3 c	304.7 cd
Alanine	1540 ab	1691 a	953.3 c	653.3 c	1540 ab	1754 a	1050 bc	853.7 c
γ - Aminobutiric acid	205 ab	266 a	63.67 ab	75.33 c	205 ab	262.3 a	69.67 c	96.33 bc
ACC	67.67 a	66 a	20 c	30 bc	67.67 a	57 a	22.67 c	51 ab
Proline	17770 ab	8095 de	7962 de	5182 e	17770 ab	21980 a	16170 bc	11820 cd
Tyrosine	80.67 c	84 bc	114.3 bc	124.3 bc	80.67 c	109.7 bc	103.3 bc	261 a
Valine	468 c	749 b	401.7 c	358.3 c	468 c	1478 a	432.3 c	887.7 b
Methionine	16 a	11 abc	14.33 ab	10.33 bc	16 a	10.33 bc	8.667 c	8.333 c
Isoleucine	213 d	400.3 c	204.7 d	178.3 d	213 d	852.7 a	202.7 d	554 b
Lysine	163.3 cd	407 b	165 cd	128.3 d	163.3 cd	531.3 a	144 d	262.3 c
Leucine	165.3 c	376.3 b	166 c	145 c	165.3 c	533.7 a	115.7 c	441.7 ab
Phenylalanine	75.33 c	76.33 c	160 b	170 b	75.33 c	161.3 b	135.3 bc	540.7 a
Total amino acid	38660 b	36280 b	23660 de	18770 e	38660 b	51020 a	34640 bc	26820 cd

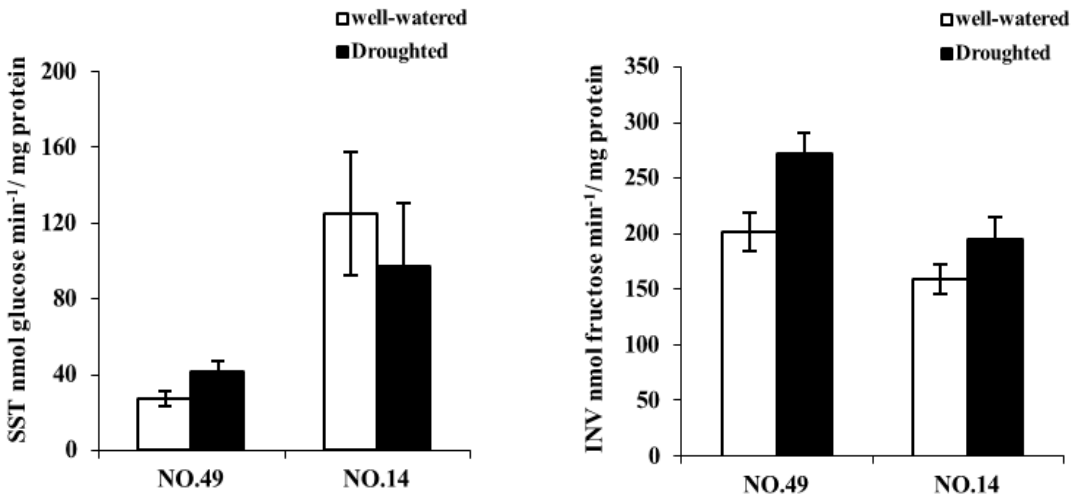
***** Amounts which are indicated in grey color, indicated the greatest concentration during different times after anthesis.
* Amino acids which are determined with red color indicate amino acids that had significant different in the changes process of concentration between normal and stress conditions.

Supplementary Table 4. The comparison of average of interaction effect of genotype × humidity treatment on different amino acid concentration of peduncle of Two genotypes after anthesis.

Amino acids	NO.49		NO.14	
(nmol / g FW)	Well-watered	Droughted	Well-watered	Droughted
Aspartic acid	2526±148	2076±110	2181±77	1980±84
Glutamic acid	5119±198	3765±161	4572±156	4379±136
Serine	3927±270	3920±205	3547±225	3747±244
Aspargine	4741±420	5397±290	1241±98	1203±102
Glycine	249±13	345±21	216±12	333±26
Glutamine	3996±360	4740±248	3826±395	3748±262
Histidine	306±23	608±62	122±10	222±25
Threonine	999±40	1079±62	811±52	980±67
Arginine	1314±98	2265±186	435±42	510±50
Alanine	1372±68	1285±77	1209±90	1299±82
γ - Aminobutiric acid	128±19	113±6	153±21	158±16
ACC	24±3	37±4	46±5	50±4
Proline	6072±613	13498±1014	9580±859	16936±873
Tyrosine	172±18	246±37	101±6	139±13
Valine	752±40	1178±88	494±34	816±75
Methionine	12±1	17±2	13±1	11±1
Isoleucine	405±22	528±49	249±18	456±48
Lysine	490±29	676±60	216±25	275±29
Leucine	316±14	361±22	213±19	314±32
Phenylalanine	227±30	457±82	121±10	228±32
Total amino acid	33147±543	42592±623	29344±482	37783±492



Supplementary Figure 1. The content of fructose, glucose, sucrose and fructan in peduncle of two bread wheat genotypes under well-watered & drought treatments.



Supplementary Figure 2. Activity of INV and SST for two genotypes (NO.14 and NO.49) during grain filling under well-watered & drought.