Ear Location, Leaf Number, Day Length, and *Leafy1* in Teosinte in the Tropics

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P**hytomer quantity** in **Huehuetenango** teosinte (G-120) and its **hybrid** with tall tropical maize (Chs 234 base) prima facie varies within long nightlength (12.3-13.5h, all context below). *Huehuetenango* changes from 21 to 37 (difference **16**) internodes **across the year**, even at latitude lower than its origin, and there is a change from 26 to 45 (difference **19**) in *hybrid*. Plants with highest quantity of course result from summer-solstice planting, in which the **lowest silking node (LSN)** in *Huehuetenango* is #23-27 with 6-12 nodes above whereas in *hybrid* #17-18 with 7-27 above. *Huehuetenango* therefore increases its quantity via **addition** below LSN in a nightlength manner whereas *hybrid* does so above in a native-leafy manner. **Fidelity** of LSN in hybrid is imprinted by the maize parent. July 1 hybrid data identifies that the teosinte (introgression) is reactive not just to **decreasing long nightlength** (cf MNL 57:38) but even for the minimum long nightlength and a brief ensuing period when it is increasing. Likewise is the indication that long-night **heterosis** in teosinte is positive (16 Δ teo v 19 Δ hyb), opposite cannon of short nightlength for the subspecies.

*(**Present work** lat 10°N ... dy lgth civ twi 12.3-13.5h ... alt 4,000/5,400 ft) (**Hue** 15-16°N cf CIMMYT 1988:78 ... 3,000-5,400 ft cf Maydica 46:105) (**G-120**/PI 441934 15.6°N... 12.0-14.1h ... 4,400 ft cf GRIN) (**Chs 234**/NSL 283379 15.2°N... 13.8h ... 100 ft cf ISBN 9781512074567)*

Internode number per **planting date**: *nodes below + (**silking nodes** + nodes above) = total (separated) nodes*

Huehuetenango:

Ja 12 gh alt 4,000 ft
- - 29 pn My 13 4m0w

Fb

Mr

Ap

My

Je 7-10 gh alt 5,400 ft
26+[10+1=11]=37 pn Dc 5 6m0w
26+[6+1=7]=33
25+[8+1=9]=34
22[a]+[12+1=13]=35 [26+9=35]

JL

Ag

Sp

Oc 15 fld alt 4,000 ft
- - 21 pn fb 28 4m2w
- - 22
- - 24

Nv

Dc

Hybrid:

Ja

Fb

Mr 19 fld alt 4,000 ft
[16.5+(7.5+2=9.5)]=26
[16.5+(9.5+2=11.5)]=28
[16.5+(9.5+3=12.5)]=29

Ap

My

Je 1 fld alt 4,000 ft
16+[20+2=22]=38 pn 5m1w
17+[26+2=28]=45 pn Nv 27 6m0w

JL 1 gh alt 4,000 ft
16+[9+2=11]=27 pn Oc 1 3m0w
[16.5+(15.5+2=17.5)]34

Ag 16 gh alt 5,400 ft
16+[6+2=8]=24 pn&sk Dc 10 4m0w
17+[7+2=9]=26

Sp

Oc

Nv

Dc

Ag 16 ***mistakenly*** *identified as Hue in previous article; Grey notes in* ***[]*** *are reference, not data;* ***fld*** *- field,* ***gh*** *- greenhouse;* ***imb*** *- imbibition,* ***pn*** *- pollen,* ***sk*** *- silk;* ***m*** *- month,* ***w*** *- week;* ***L*** *- leaves,* ***IN*** *- internodes*

Additional Data:

Plants in ***Allegany, New York field*** *(lat 42°N; dy lgth civ twi Jl 21 15.9h, Ag 22 14.6h, Sp 1 14.1h, Sp 21 13.1h, Oc 16 12.0h; alt 1,400 ft) given 14.5 h nightlength/****9.5 h day*** *for* ***1 mo*** *(cf MNL 89:2) after* ***July 21*** *imbibition, followed by field nightlength (eg Crop Sci 10:465) until only 11 h HPS light beginning Oct 10, unless noted; plants might react short-night until last wk Aug (from 5L 18d Ag 8 = 2.5 wk)*

Hue

[basically 20+(6+1=7)=27]
18+(6+2=8)=26 sk Nv 26 4m1w
20+(6+2=8)=28 sk Nv 30 4m1w
21+(6+1=7)=28 sk Nv 30 4m1w
20+(6+1=7)=27 sk Dc 3 4m1w
20+(5+2=7)=27 sk Dc 6 4m2w

Hybrid

22+(7+2=9)=31 sk Nv 17 3m3w

Hybrid + *Lfy1*

[basically 22+(12+8=20)=42]
22+(12+8=20)=42 sk Nv 26 4m1w
23+(10+9=19)=37+(IN) (42L) sk Nv 19 4m0w
27[a]+(4+8=12)=39 sk Dc 10/4m2w [22+(9+8=17)=39]
25% temperate

lat 10° imb Mr 19 sk Sp 25 6m1w
[16.5+(18.5+2=21.5)]38
[16.5+(43.5+2=46.5)]=63
[16.5+(44.5+2=47.5)]=64
[16.5+(45.5+2=48.5)]65
0% temperate

[a] *LSN flexes (Hue down, hyb up), phytomer total normal; wildtype approximately 30L whereas Lfy1 40L; reactive teosinte putatively induces quicker than reactive maize; 10L long-night reaction in wild-type hybrid transfers to 20L reaction in Lfy1*

¾ Maize

[basically 17+(3+4=7)=24]
[b]18+(2+7=9)=27 pn Nv 8 3m2w
17+(3+4=7)=24 pn Nv 17 3m3w
16+(4+2=6)=22 sk Nv 26 4m1w
13% temperate

Maize

24+(2+8=10)=34
19+(1+8=9)=28
19% temperate

[basically 24+(1+6=7)=31]
[24+(1+8=9)]=33
24+(1+6=7)=31
24+(1+5=6)=30
23+(1+6=7)=30
0% temperate

[b]18+(1+7=8)=26
13+(1+8=9)=22
0% temperate

Maize + *Lfy1*

[basically 23+(2+15=17)=40]
23+(2+15=17)=40
22+(2+15=17)=39
[22+(2+12=14)]=36
33% temperate

22+(1+15=16)=38
20+(1+10=11)=31
19% temperate

[b] *short-night reaction missing due to stress*