



# FireWall and FireLine Deliver Effective Solutions Against “Huanglongbing” (HLB)

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Successful treatment against *Candidatus Liberibacter asiaticus* (CLAs), the plant pathogenic bacteria which causes ‘HLB’ in citrus, requires the integration of three essential components: First, the product(s) used must be bactericidally active against CLAs; Second, they must effectively deliver the bactericide to exactly where CLAs resides inside the tree; and Third, they must provide extended internal exposure against CLAs, thus enabling tree health recovery (see illustration at right).



Based on results from multiple, large-scale, replicated field trials across Florida on round oranges (‘Hamlin’ and ‘Valencia’) and grapefruit, real-time Polymerase Chain Reaction (PCR) assays have demonstrated FireWall 50 WP and FireLine 17 WP are 1) bactericidally active against HLB, 2) that they deliver this activity to where CLAs is inside the tree and 3) that they maintain this activity against HLB over an extended period of time.

In trees <6 yrs. old, *Liberibacter* titer (Ct) was reduced up to ~7.4 times below the Untreated ( $p = 0.05/95\%$  Statistical Confidence Interval) as a result of FireWall and FireLine treatments (see figure below). Field evaluations and physical tree measurements also revealed young trees (<6-years old) respond positively to both FireLine & FireWall treatments regardless of type (‘Hamlin’, ‘Valencia’ or grapefruit). These responses include consistent overall tree health improvement and reduced fruit drop. Also significant ( $p \leq 0.05$ ) were reductions in: leaf drop, branch dieback and visual HLB symptoms. Older trees (6+ years) are showing positive statistical trends toward improved tree health but have not reached the  $p \leq 0.05$  level of confidence, as yet. FireWall and FireLine have been scientifically demonstrated to be real solutions in the on-going fight against HLB in citrus.

In the figure below, real-time PCR results for *Liberibacter* Titer (Ct) in March 2015 is shown in response to FireWall and FireLine foliar sprays applied in late summer – early fall, 2014. Bars represent combined average Ct results for ‘Hamlin’, ‘Valencia’ and Grapefruit trees, 5 years and younger. Relative reduction in CLAs indicated by “X”,  $p$ =significance level.

