

PENGELOLAAN PENYAKIT HUANGLONGBING PADA JERUK DENGAN KOMPATIBILITAS JENIS BATANG ATAS/BAWAH, PEMUPUKAN DAN PENYUNGKUPAN TANAMAN

INTISARI

Huanglongbing (HLB) dikenal sebagai penyakit yang menghancurkan produksi jeruk. Penyakit ini disebabkan oleh *Candidatus liberibacter asiaticus* (CLas). Beberapa metode pengendalian telah diterapkan tetapi hasilnya belum memuaskan. Tujuan penelitian ini adalah: 1). Mengetahui pengaruh kombinasi batang atas/bawah jeruk terhadap perkembangan penyakit HLB dan pertumbuhan tanaman. 2). Mengetahui pengaruh pemupukan organik dan penyungkupan pada tanaman jeruk muda dan penyungkupan tanaman pada jeruk umur produktif terhadap perkembangan penyakit HLB dan pertumbuhan tanaman. 3). Mengetahui pengaruh pupuk hayati terhadap intensitas penyakit HLB dan pertumbuhan tanaman. Tahapan penelitian sebagai berikut: Kombinasi penyambungan menggunakan 3 varietas batang bawah: Japansche citroen (*Citrus limonia* Osbeck), Volkamer lemon (*C. volkameriana* V. Ten & Pasq), 'Salam' dan 2 varietas batang atas: 'Siem Pontianak' (*C. nobilis* Lour) dan 'Keprok Tejakula' (*C. reticulata* Blanco). Bibit jeruk diinokulasi dengan jaringan kulit terinfeksi HLB dan diletakkan di *screen house* yang terdapat vektor patogen. Penelitian pada tanaman jeruk muda menggunakan tiga faktor perlakuan yaitu: status infeksi patogen (konsentrasi CLas rendah dan tinggi), jenis pupuk organik (pupuk organik buatan pabrik, kompos daun dan pupuk kandang) dan penyungkupan tanaman. Perlakuan pada tanaman jeruk umur produktif menggunakan tiga faktor perlakuan yaitu kultivar jeruk ('Siam Purworejo' (*C. nobilis* Lour) dan 'Pamelo Nambangan' (*C. maxima* (Burm.) Merr.)), status infeksi patogen (tanaman yang tidak stabil terinfeksi HLB (+), sehat (-) dan terinfeksi HLB (++)) dan penyungkupan tanaman. Perlakuan pupuk hayati A (buatan pabrik) dan pupuk hayati B (buatan petani) diaplikasi pada kultivar 'Siam Purworejo' (*Citrus nobilis* Lour) yang diinokulasi dengan inokulum CLas dan penularan alami oleh vektor. Hasil ketiga penelitian menunjukkan kombinasi 'Siam Pontianak'/V. lemon mempunyai persentase infeksi patogen paling rendah berdasarkan penularan CLas secara buatan, sedangkan 'Keprok Tejakula'/'Salam' mempunyai persentase infeksi patogen paling rendah dan kemunculan gejala paling lambat berdasarkan penularan alami melalui vektor. Infeksi patogen secara buatan meningkatkan diameter dibanding infeksi melalui vektor. Pemupukan organik disertai dengan penyungkupan pada tanaman muda 'Siam Purworejo' dan penyungkupan tanaman umur produktif kultivar 'Siam Purworejo' dan 'Pamelo Nambangan' yang terinfeksi menurunkan intensitas penyakit meskipun tanaman tetap mengandung bakteri CLas. Penyungkupan pada tanaman muda dengan kerapatan sel bakteri CLas yang tinggi dan penyungkupan tanaman umur produktif meningkatkan pertumbuhan tunas baru. Perlakuan pupuk kandang menaikkan diameter kanopi. Pada tanaman dengan kerapatan sel CLas yang rendah, diameter kanopi dan jumlah cabang tertinggi terdapat pada tanaman yang diaplikasi pupuk organik pabrik dan penyungkupan tanaman. Penyungkupan tanaman muda menaikkan kadar prolin, berat kering akar dan daun. Penyungkupan pada tanaman produktif meningkatkan kadar klorofil a dan unsur Zn pada daun tanaman terinfeksi. Pupuk hayati B mampu mengurangi intensitas penyakit HLB dan memperlambat kematian tanaman meskipun tidak menurunkan kerapatan sel CLas. Lebar dan volume kanopi terbesar terdapat pada tanaman dengan inokulasi CLas secara buatan tanpa pemupukan.

Kata kunci: Huanglongbing, jeruk, penyungkupan, pupuk hayati, pupuk organik

**MANAGEMENT OF HUANGLONGBING DISEASE ON CITRUS
BY COMPATIBILITY OF SCION/ROOTSTOCK COMBINATION, FERTILIZER
AND PLANTS COVERING**

ABSTRACT

Huanglongbing (HLB) is known as destructive disease on citrus production. The disease is caused by *Candidatus liberibacter asiaticus* (CLas). Several control methods have been implemented but the results have not been satisfactory. The purposes of this research were: 1). To study the effect rootstock/scion combination on HLB disease intensity and plant growth, 2). To investigate the influence organic fertilizer and plant covering treatments on young citrus and plant covering treatment on citrus productive plants, 3). To understand the influence of biological fertilizer on the intensity of HLB disease and plant growth. The research stages were as follows: The rootstock/scion combination used three varieties of rootstock: Japansche citroen (*Citrus limonia* Osbeck), Volkamer lemon (*C. volkameriana* V. Ten & Pasq), 'Salam' and two varieties of scion: 'Siem Pontianak' (*C. nobilis* Lour) and 'Keprok Tejakula' (*C. reticulata* Blanco). Citrus seedlings were inoculated with HLB-infected bark tissue and were put in a screen house containing pathogen vector. Research in young citrus used three treatment factors: pathogen infection status (the low and high of CLas concentration), types of organic fertilizer (factory-produced organic fertilizer, leaf compost, and manure), and plant covering. The treatment for citrus productive plant used three treatment factors namely citrus cultivar ('Siam Purworejo' (*C. nobilis* Lour) and 'Pamelo Nambangan' (*C. maxima* (Burm.) Merr.)), pathogen infection (unstable, HLB-infected plants (+), healthy plants (-) and permanently HLB-infected plants (++)) and plant covering. Biofertilizer A (factory-produced) and biofertilizer B (farmer-produced) were applied to 'Siam Purworejo' (*Citrus nobilis* Lour) cultivar which inoculated with CLas inoculum and natural infection by vector. The result showed that the combination of rootstock/ scion varieties had an influence on the rate development of the initial infection of HLB disease. The combination of 'Siam Pontianak'/V. lemon had the lowest percentage of pathogen infection based on artificially CLas infection. Meanwhile, 'Keprok Tejakula'/'Salam' had the lowest percentage of pathogen infection and the slowest emergence of symptoms based on natural infection by vector. Artificially pathogen infection increased the diameter compared with infection by vector. Organic fertilizing along with covering towards young cultivar of 'Siam Purworejo' and covering towards productive cultivars of 'Siam Purworejo' and 'Pamelo Nambangan' which were infected decreased the disease intensity even though the plants remained infected CLas bacteria. The covering towards young plants with high cell density of CLas and the covering towards productive plants boosted new bud growth. The treatment with manure increased the diameter of canopy. Towards plants with low cell density of CLas, the highest number of branch and the diameter of canopy were found in the plants which were fertilized using factory-produced organic fertilizer and were covered. The covering towards young plants containing high level of CLas decreased the chlorophyll a, Fe, and Zn on the leaf tissue and increased the proline, dry weight for roots and leaves. The covering towards productive plants increased chlorophyll a and element of Zn in infected plant leaves. Biofertilizer B was able to decrease the intensity of HLB disease and delayed the plant death although not decreasing the CLas cell density consistently. Type of biofertilizer influenced in the timing of bud emergence. The widest and the biggest canopy was found in artificially-inoculated CLas plants.

Key words: Biofertilizer, citrus, covering, huanglongbing, organic fertilizer