Development and Evaluation of Organic Biofertilizer Using Oil Palm Empty Fruit Bunch as Composted Medium for Vegetable Gardening

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ABSTRACT

In Malaysia, the oil palm industries generate approximately 90 million tonnes of renewable biomass each year. The empty fruit bunch (EFB) contributes the highest amount of solid waste from this industry. Various studies were conducted on managing the solid waste such as EFB by means of composting process. The objectives of this study were to develop organic biofertilizer using the oil palm empty fruit bunch as medium using effective microbes and to test and evaluate the use of biofertilizer developed on the vegetable gardening. The study revealed that vegetable of *Capsicum annuum* L. (Chili) that grew with the mature compost that were spiked with *Burkholderia unamae* P10 (Bioctiv-SF1) and *Enterobacter cloacae* P11 (Bioactiv-SF2) revealed to have positive impacts on the growth of the Chilies. The treatment with the mature compost cured with *Enterobacter cloacae* (P11) showed the best result among the other treatments. This included the highest values of height, greater growth of roots formation, and early induction of flowering. Further study should be conducted in longer period and bigger sample size in order to get more data on the application of these two types of bacterial on the vegetable garden.

Key words: Empty fruit bunch, biomass, mature compost and biofertilizer.

ABSTRAK

Industri kelapa sawit di Malaysia menghasilkan kira-kira 90 juta tan biomas yang boleh dikitar semula pada setiap tahun. Tandan kelapa sawit kosong merupakan penyumbang terbesar kepada penghasilan sisa pepejal daripada industri ini. Banyak kajian telah dijalankan bagi menguruskan sisa pepejal seperti tandan kelapa sawit kosong iaitu melalui proses penghasilan kompos. Kajian ini dijalankan bagi menghasilkan baja bio menggunakan tandan kelapa sawit kosong sebagai media yang dicampur dengan bakteria dan untuk mengkaji serta menilai penggunaan baja bio tersebut ke atas tanaman sayuran. Kajian ini membuktikan Capsicum annuum L. (cili) yang ditanam bersama kompos matang yang dicampur dengan Burkholderia unamae P10 (Bioctiv-SF1) and Enterobacter cloacae P11 (Bioactiv-SF2) menunjukkan kesan positif terhadap pertumbuhan pokok cili. Uji kaji yang menggunakan kompos matang yang dirawat dengan Enterobacter cloacae (P11) menunjukkan hasil yang terbaik berbanding yang lain. Ini termasuklah ukuran ketinggian yang tertinggi, pertumbuhan akar yang lebih banyak serta penghasilan bunga yang lebih awal. Kajian yang lebih mendalam hendaklah dijalankan untuk tempoh yang lebih panjang dan saiz sampel yang lebih besar bagi mendapatkan lebih banyak data tentang penggunaan dua jenis bacteria ini terhadap tanaman sayuran.

Kata kunci: Tandan kelapa sawit kosong, biomas, kompos matang dan baja bio.