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GREEN AGRI-FOOD ENERGY PRODUCTION FOR A BETTER WORLD IN A CHANGING CLIMATE

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ABSTRACT—The use of agricultural production facilities that are produced from non-renewable natural resources such as fertilizers and chemical pesticides is feared that it will disrupt environmental sustainability and reduce soil fertility and quality. The application of biotechnology derived from local resources is a very appropriate alternative to address these challenges, such as the use of local microorganisms that act as biological fertilizer. The study aims to determine the potential of the bacterium *Bacillus cereus* strain ATCC 14579, *Bacillus subtillis* subsp. Substrate strain 168 *Bacillus siamensis* strain KCTC13613, *Azotobacter* sp. and *Pseudomonas fluorescens* isolated from banana stem bud local micro organism (LMO) which acts as biological fertilizer and its ability to increase the growth of paddy. The study was conducted in February to July 2019 in Biology Laboratory of Payakumbuh Agricultural Polytechnic , with 2 stages namely : 1) Testing the potential of bacteria as a phosphate solvent using pikovkayas media and nitrogen-fixing bacteria from the air using free N media; 2) application of potential bacteria as biological fertilizer after formulation on peat soils in SRI method in greenhouses. The study used a randomized block design with 6 treatments and 3 replications. The data obtained were analyzed for variance (ANOVA) and continued with duncan test. The results showed that the five bacteria tested had the potential as biological fertilizers because they acted as phosphate solvents and air nitrogen binding. The application of biological fertilizer in SRI method in greenhouses has not been able to increase the vegetative growth of 77 days after planting.

AST-128

THE APPLICATION BIOFERTILIZER CONTAINING AZOTOBACTER BACTERIA AND PSEUDOMONAS FLUORESCENTS INDIGENOUS FORMULATION OF ORGANIC COMPOS WITH VARIOUS SUBSITUTION MATERIALS ON RICE PRODUCTION SRI METHOD

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ABSTRACT—Rice cultivation method SRI (The System of Rice Intensification) vegetative phase of aerobic conditions so that beneficial microbes live with abundant populations can increase rice production. The SRI method has been carried out by various combinations of production technology. The SRI method changes the management of rice plants with organic matter and reduces inorganic fertilization. Organic matter and microbial biotic activity function to create and stabilize soil structure. The use of organic fertiizers containing microbes in paddy soils increases plant growth and soil quality by influencing microbial activity and population. The purpose of this study was to obtain suitable organic compost media for *Biofertilizer* fertilizers containing *Azotobacter* bacteria and *Pseudomonas fluorescents* to increase rice production in the SRI method.The study used a randomized block design with 7 treatments and 3 replications. The treatments used are: (1). B0: Compost, (2). B1: Compost + sugar + bacteria (*Azotobacter* and *P. fluorescents*), (3). B2: Compost + Molasses + Bacteria (*Azotobacter* and *P fluorescents*). (4). B3: Compost + CMC + bacteria (*Azotobacter* and *P fluorescents*), (5). B3: Compost + Arginine + bacteria (*Azotobacter* and *P. fluorescents*). (6). B4: Compost + Sugar + CMC + bacteria (*Azotobacter* and *P. fluorescents*). (7). B5: Compost + Molasse + Arginine + bacteria (*Azotobacter* and *P. fluorescents*). The results showed that vegetative observations of plant height and the number of tillers were obtained in the B3 treatment (Compost + CMC + bacteria (*Azotobacter* and *P. fluorescents*) which were 137.33 cm and 36 tillers were significantly different from other treatments. Generative observations for all observed parameters were highest contained in the B3 treatment (Compost + CMC + bacteria (*Azotobacter* and *P. fluorescents*), namely panicle number 35.00, number of seeds/panicle 299.33 seeds, weight of 1000 seeds 23.61 gram and production of 198.17 gram / different plot Concrete Biofertilizer with Compost + CMC + bacteria (*Azotobacter* and *P. fluorescents*) can increase the growth and rice production of SRI method.

AST-129

THE TEST OF STORAGE TIME FOR AZOTOBACTER BACTERIA ISOLATE FORMULATION,INDIGENOUS PSEUDOMONAS FLUORESCENTS AS BIOFERTILIZER ON THE NUMBER OF BACTERIAL COLONIES

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ABSTRACT—The problem of element N in wetlands is its availability is short, easily dissolved in water, carried by percolation, surface runoff and volatile. The efficiency of N (Urea) fertilizer uptake by lowland rice plants is relatively low around 30-50%, this adds to the number of production costs borne by farmers. Intensive use of chemical fertilizers for long-term agricultural land causes a decrease in soil organic content, damaged soil structure and environmental pollution.Effective and efficient solutions to biological approaches by utilizing rhizobacteria groups. The existence of indigenous rhizobacteria is very diverse in the soil. This is influenced by biotic and abiotic factors that are in the soil. Types of rhizobacteria that have been found in previous studies are Pseudomonas fluorescents and indigenous Azotobacter. Both of these bacteria were tested on various formulation media and their effects on the total population of bacteria, ph da Eh. The method used is a completely randomized design with 3 replications. The treatment of various types of media are: M0 = Compost, M1 = Compost + Sugar + bacteria (A + P), M2 = Compost + Molasses + bacteria (A + P), M3 = Compost + CMC + bacteria (A + P) , M4 = Compost + Molasses + bacteria (A + P), M5 = Compost + Molasses + bacteria (A + P), M6 = Compost + CMC + Arginine + bacteria (A + P). Statistical analysis showed that the best microbial media in the first-month storage was M5 = Compost + Molasses + bacteria (A + P), which was significantly different from other microbial media. In the 2nd, 3,4th and 5th months the highest bacterial population was found in the microbial media M2 = Compost + Molasses + bacteria (A + P). The highest number of bacterial populations was obtained in the storage media of the 3rd-month formulation which reached 244.33 CFU significantly different from other treatments. During storage, the highest population number was obtained at the M2 treatment starting from month 2 to month 5. Stable ph value in the treatment of M2, M4 and M6. The redox potential of almost all treatments was except M6 was stable.The conclusion in the M2 treatment was obtained the highest number of bacterial populations during storage, the pH value was relatively stable and the value of the redox potential increase