

## INTISARI

Emisi Gas Rumah Kaca adalah salah satu penyebab terjadinya pemanasan global. Ada tiga GRK utama yaitu CO<sub>2</sub>, N<sub>2</sub>O, dan CH<sub>4</sub>. Walaupun N<sub>2</sub>O jumlahnya lebih sedikit jika dibandingkan CO<sub>2</sub>, Nilai *Global Warming Potential* N<sub>2</sub>O 310 kali lebih besar jika dibandingkan dengan CO<sub>2</sub>. Sekitar 55.46% emisi N<sub>2</sub>O berasal dari lahan pertanian. N<sub>2</sub>O di lahan pertanian dapat berasal dari proses denitrifikasi dan nitrifikasi. Pengaplikasian Biochar yang dapat menurunkan emisi N<sub>2</sub>O dan logam oksida Fe dinilai mampu berperan sebagai katalisator dapat mengurangi produksi emisi N<sub>2</sub>O. Penelitian ini bertujuan untuk mengevaluasi pengaruh perlakuan biochar dan logam oksida Fe terhadap emisi N<sub>2</sub>O. Penelitian ini dilakukan dengan pengaplikasian biochar daun gelam, biochar sekam padi, dan kombinasi biochar-Fe<sub>3</sub>O<sub>4</sub>. Pengambilan sampel gas dilakukan sebanyak 6 kali dengan menggunakan alat *Closed Chamber*. Hasil penelitian menunjukkan bahwa perlakuan *double dosis* Biochar Sekam Padi 5 ton.ha<sup>-1</sup> kombinasi Fe 5% (BSP4) dapat mendukung pertumbuhan tanaman kedelai, mengurangi populasi nematoda parasitik, dan menghasilkan total emisi N<sub>2</sub>O yang rendah serta peningkatan emisi N<sub>2</sub>O yang rendah.

Kata kunci : N<sub>2</sub>O, biochar, logam oksida Fe

## **ABSTRACT**

Greenhouse Gas (GHG) emissions are one of the main causes of global warming. There are three primary GHGs: CO<sub>2</sub>, N<sub>2</sub>O, and CH<sub>4</sub>. Although N<sub>2</sub>O is present in smaller quantities compared to CO<sub>2</sub>, its Global Warming Potential is 310 times greater than that of CO<sub>2</sub>. Approximately 55.46% of N<sub>2</sub>O emissions originate from agricultural land. In agricultural fields, N<sub>2</sub>O can result from denitrification and nitrification processes. The application of biochar, which can reduce N<sub>2</sub>O emissions, and iron oxide metals, which can act as catalysts, is considered effective in reducing N<sub>2</sub>O emissions. This study aims to evaluate the effect of biochar and iron oxide treatments on N<sub>2</sub>O emissions. The study was conducted using gelam leaf biochar, rice husk biochar, and a combination of biochar-Fe<sub>3</sub>O<sub>4</sub>. Gas sampling was carried out six times using a Closed Chamber device. The results showed that the double dose treatment of rice husk biochar at 5 tons.ha<sup>-1</sup> combined with 5% Fe (BSP4) supported soybean plant growth, reduced parasitic nematode populations, and resulted in both low total N<sub>2</sub>O emissions and minimal increases in N<sub>2</sub>O emissions.

Keywords: N<sub>2</sub>O, biochar, Fe metal oxides