

**PENGARUH DOSIS RADIASI SINAR GAMMA TERHADAP PERTUMBUHAN,
PRODUKSI DAN KERAGAMAN GENETIK *Brachiaria brizantha* cv. MG5
PADA BERBAGAI FASE *REGROWTH***

INTISARI

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Tujuan dari penelitian ini adalah untuk mengetahui pengaruh dosis radiasi sinar gamma pada berbagai fase *regrowth* terhadap pertumbuhan, produksi dan keragaman genetik *Brachiaria brizantha* cv. MG5. Dosis radiasi sinar gamma yang diberikan adalah 0, 100, 200, 300 dan 400 Gy masing-masing dengan 15 ulangan. Biji yang telah diradiasi di germinasi selama 2 minggu, kemudian dilakukan penanaman di *polybag*. Pengamatan yang dilakukan meliputi tinggi dan panjang tanaman, jumlah daun dan jumlah anakan, lebar daun, diameter batang, kandungan BK dan BO serta produksi bahan kering dan produksi bahan organik. Pengamatan dilakukan pada fase *regrowth* ke-1 (60 hari), ke-2 (60 hari) dan ke-3 (60 hari). Data pertumbuhan dan produksi *Brachiaria brizantha* cv. MG5 dianalisis menggunakan analisis variansi Rancangan Acak Lengkap Pola Faktorial 5 x 3. Faktor pertama berupa perlakuan dosis radiasi sinar gamma (0, 100, 200, 300 dan 400 Gy) dan faktor kedua berupa fase *regrowth* (*regrowth* 1, 2 dan 3). Apabila terdapat perbedaan nyata sebagai efek dari perlakuan dilanjutkan dengan uji *Duncan's Multiple Range Test* (DMRT). Keragaman genetik diperoleh menggunakan RAPD-PCR. Hasil penelitian menunjukkan bahwa dosis radiasi sinar gamma berpengaruh nyata ($P < 0,05$) terhadap tinggi dan panjang tanaman, jumlah daun dan jumlah anakan, lebar daun, kandungan BK dan BO serta produksi bahan kering dan produksi bahan organik. Dosis 100 Gy menunjukkan tinggi, panjang tanaman, produksi bahan kering dan bahan organik tertinggi sedangkan Dosis 200 Gy menunjukkan jumlah daun dan anakan tertinggi ($P < 0,05$). *Regrowth* ke-2 menunjukkan tinggi tanaman, jumlah daun dan anakan, lebar daun, diameter batang kandungan BK dan BO serta produksi bahan kering dan bahan organik tertinggi. Terdapat interaksi ($P < 0,05$) antara dosis radiasi sinar gamma dengan fase *regrowth*. Adanya keragaman genetik ditunjukkan dua kelompok dalam dendrogram yaitu kelompok A (0, 100, 200, 300 Gy) dan kelompok B (400 Gy). Kesimpulan hasil penelitian yaitu dosis radiasi sinar gamma 100 Gy akan menghasilkan pertumbuhan dan produksi terbaik pada *Brachiaria brizantha* cv. MG5.

Kata kunci: *Brachiaria brizantha* cv. MG5, Keragaman genetik, Pertumbuhan, Produksi, Radiasi sinar gamma, *Regrowth*.

THE EFFECT OF DOSE GAMMA RADIATION ON GROWTH,
PRODUCTION AND GENETIC VARIETY OF

Brachiaria brizantha cv. MG5
ON REGROWTH PHASE

ABSTRACT

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This study aimed to determine the effect of gamma radiation dose into *regrowth* phases on growth, production and genetic variety of *Brachiaria brizantha* cv. MG5. Dose of gamma radiation were 0, 100, 200, 300, and 400 Gy, with 15 replicates for each dose. Radiated seeds were germinated for 2 weeks, then they were planted on polybag. The variables measured were growth (height of grass, length of grass, number of leaves, number of tillers, width of leaves and stem diameter), dry matter and organic matter, production (dry matter production and organic matter production) and genetic variety. The study was conducted for a total of 180 days from *regrowth* phase 1 to 3. Data was analyzed in factorial design 5 x 3, the first factor was a dose of gamma radiation (0, 100, 200, 300, and 400 Gy) and second factor was *regrowth* phase (phase 1, 2, and 3). The difference between means was analyzed using Duncan's Multiple Range Test (DMRT). RAPD PCR was employed for genetic variety analysis. The results showed that dose of gamma radiation on *regrowth* phases were significant ($P < 0.05$) on height and length of grass, number of leaves and tillers, width of leaves, dry matter, organic matter dry matter production and organic matter production. Dose of 100 Gy gamma radiation showed the highest height and length of grass, dry matter production and organic matter production. Dose of 200 Gy gamma radiation showed the highest number of leaves and tillers ($P < 0.05$). *Regrowth* phase 2 showed the highest height of grass, number of leaves, and tillers, width of leaves, diameter of stem, dry matter and organic matter, dry matter production and organic matter production. There was interaction between dose of gamma radiation and *regrowth* phases on growth and production *Brachiaria brizantha* cv. MG5 ($P < 0.05$). There was a genetic variety on two groups on dendrogram, such as group A (0, 100, 200, 300 Gy) and group B (400 Gy). In conclusion, the dose 100 Gy was the best plant growth and plant production *Brachiaria brizantha* cv. MG5.

Keywords: *Brachiaria brizantha* cv. MG5, Gamma radiation, Genetic variety, Growth, Production, *Regrowth*.