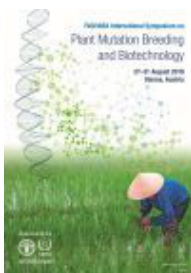


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THE RELATIONSHIP BETWEEN THE PRESENCE OF BRANCHED EARS, FERTILITY, SEEDLING GROWTH AND ENERGY CONVERSION AFTER GAMMA IRRADIATION OF KERNELS IN TRITICUM AESTIVUM L.

The study was conducted to determine whether the efficiency of energy conversion into growth and the presence of branched ears can be used as indicators for the determination of the optimal gamma irradiation dosage for mutation breeding in relation to fertility reduction. To meet this objective, efficiency of energy conversion, fertility and presence of branched ears were studied in two wheat (*Triticum aestivum* L.) breeding lines with 0, 150, 200 and 250 Gy gamma-irradiation of kernels. Ten kernels were collected 60 hours after onset of imbibition and then every 12 hours until 132 hours and planted for the determination of the growth parameters. 26 blocks (consisting of 16 plants each) were used for the control together with each irradiation dosage for the determination of the fertility and branched ears. Breeding line 1 displayed better resistance to the retardation effects of the dosages than Breeding line 2 concerning the growth parameters and fertility. In both breeding lines, there were highly significant correlations between the efficiency of energy conversion and fertility with 0.597 and 0.527 respectively for Breeding line 1 and 2. Branched ears were observed at dosages where root growth was $\geq 10\%$ retarded than shoot growth. Branched ears were observed at all the irradiation dosages in Breeding line 2 and only at 250 Gy in Breeding line 1. Branched ears were absent at dosages where the efficiency of energy conversion was entangled for specific irradiation dosages with the control. An increase in shoot growth retardation puts an upper limit to the presence of branched ears as observed at 250 Gy in Breeding line 2. A combination of the efficiency of energy conversion into growth and presence of branched ears will give the best indication of the optimal gamma irradiation dosage for mutation breeding.

Country or International Organization

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Track Classification: Enhancing agricultural biodiversity through new mutation induction techniques