Letter to the Editor

NMR — An Eye to the Plant Breeder

Sir,

Srinivasan et al. (1) have misled readers by pointing out that while estimating oil in oilseeds by pulsed NMR, the effect of relaxation time has not been considered in our Institute. The fact is, the effect of iodine value (IV) of oils on NMR response has been mentioned (2,4) by stating that for correct NMR analysis of the oil content of seed, the instrument must be calibrated with seed of the same variety as the samples and their fatty acid composition should be similar. A correlation between relaxation time and IV by Tiwari et al. (3) has been established. Based on that, the error introduced on oil estimation due to such variation in relaxation times has been calculated and reported (4).

Further from the data presented by Srinivasan et al. (1), a linear correlation coefficient of +0.72 between oil content and relaxation times of cottonseed samples has been obtained by me. It may be due to protein-oil interaction (5) and quality of oil in oilseeds (3,4). Based on that, oil and protein content and water and protein content in oilseeds (due to protein water interaction) can be estimated from their relaxation times by a suitable calibration graph.

The standardization work done by Tiwari and Burk (6) and Gambhir and Agarwala (7) is based on the assumption that the relaxation times of oil in oilseed remains constant, which is contrary to the histogram of relaxation times variation vs number of oilseed samples presented (8).

In addition, Gambhir and Agarwala (7) have never taken into consideration the point made (9), that is, "It is not clear if the derived components represent different phases of water or merely to paramaterize a continuous distribution of water molecule mobilities and relaxation times." Gambhir et al. (10) have reproduced the work of Yu. G. Kulesh and A.M. Chernityn (11) without acknowledging their work. Tiwari et al. (12), while correlating the drought-resistant variety of millet pearl, wheat and rice with the relaxation time have mentioned that the effect of paramagnetic ions on spin lattice relaxation time of many plant tissues was found to be almost negligible, which is contrary to the findings of Sujata Gopalakrishna et al. (13) and Gambhir (14).

In spite of the limitation of oil estimation by NMR due to the variation in relaxation times, NMR can still be used as an eye to the plant breeder.

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