A new technique for determining composition of oilseeds before planting

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A new technique involving the immersion of oilseeds in lipid solvents allows the extraction of enough oil for analytical purposes without destroying seed viability. This testing procedure makes it possible to reject seed samples with undesirable oil composition characteristics before planting.

Anew method for determining oil quality that may be useful in oilseed selection experiments is under investigation at the Department of Agronomy, University of California, Riverside. It was found that seeds of flax, safflower, soybeans, sunflower and sesame retain their viability after they have been immersed in a lipid solvent for several days. During this immersion period a small amount of seed oil was extracted from the seed and later recovered after the solvent was evaporated. The small amount of oil obtained from the seed sample was sufficient for analysis by gas liquid chromatography. This analysis allowed selection of only those seed samples with the desired oil composition characteristics for planting.

This method is especially practical when the unit sampled is a single plant, head or pod in which several seeds are available. When single seeds need to be analyzed the method is quite effective with large seeds from such plants as sunflower, safflower, and soybeans. With smaller seeds such as sesame and flax it is not always possible to obtain enough oil for analytical purposes.

The following solvents were found satisfactory: petroleum ether, ether, benzene, chloroform, heptane, carbon tetrachloride and acetone. The first three solvents appeared to extract the greatest quantities of oil at room temperature. At least one drop of oil from any one of the above-mentioned crops could be extracted within 48 hours from 1 to 2 grams of seed without significant decrease in seed viability. Protracted immersion of up to 40 days in petroleum ether did not decrease the viability of flax, sesame or safflower seed by more than 10 per cent. Ethyl alcohol (95 per cent) destroyed the viability of all these seeds within 6 to 12 hours, with the exception of sesame which remained viable after 2 days of soaking. Treated seed of each crop germinated within the same soil temperature limits as untreated seed. After germination, the oilseeds tested were transplanted to 6-inch pots and transferred to the greenhouse where they continued their normal development to maturity.

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