At 28 test locations, Numar has shown a yield superiority over California Mariout of 14 per cent, with a 10 to 13 per cent advantage in the major producing areas (see table 2). Its greatest comparative superiority (25 to 35 per cent) has resulted from early plantings in the Sacramento Valley, and in three test locations in the northern part of the San Joaquin Valley in 1967. In the Sacramento Valley, the greater advantage was partially attributed to Numar's improved straw quality; excessive lodging largely eliminated California Mariout from production under these conditions. Although both Numar and California Mariout are susceptible to scald, Numar's greater resistance to lodging can help reduce the destructiveness of this disease. It definitely contributed to Numar's favorable performance in the 1967 northern San Joaquin Valley trials, where scald was extremely severe. This secondary effect of straw strength on disease losses will be useful throughout the San Joaquin Valley where scald is often a severe problem. When scald is present, Numar's yield superiority over California Mariout could be considerably greater than that found at the West Side Field Station, Fresno County, and the Tulare Lake area (see table 2) (where data were obtained under minimum disease conditions).

On the basis of their relative performances Numar could replace California Mariout. However, Numar reaches maturity one to three days later than California Mariout—a factor worth considering in those areas where early maturity is essential.

Numar approaches Arivat in straw strength, but is slightly inferior to Briggs. Although definitely superior to California Mariout, Numar's additional straw strength will not completely eliminate lodging under conditions of high fertility and irrigation, and under other conditions which encourage severe lodging. However, the variety is expected to reduce the lodging problem for growers—both by delaying the time of lodging, and reducing its severity. Under conditions where partial lodging of California Mariout occurs, Numar should not be affected.

As indicated by the data, there is a considerable overlap in the areas of adaptation of Numar and Briggs. Collectively they encompass the total distribution pattern of the parental varieties. Each variety is worthy of the consideration of growers who have successfully grown either Arivat or California Mariout. The additional straw strength of Numar may permit adjustments in management practices in the California Mariout areas which could further enhance productivity. The favorable performance of Briggs in much of the San Joaquin Valley, coupled with its better tolerance to barley scald, offers growers in that area both the choice of a second variety, and more flexibility in planting dates.

TABLE 2. COMPARATIVE YIELD PERFORMANCE OF NUMAR, BRIGGS AND ARIVAT BARLEY AS COMPARED WITH CALIFORNIA MARIOUT

Location	Number of trials	Yield		
		Numar	Briggs	Arivat
		Per cent of Calif. Mariout		
Sacramento Valley	4	108	116	109
Davis (Dec. planting)	3	135	149	134
Davis (Jan. planting)	5	105	111	100
Upper San Joaquin*	3	126	161	155
W.S.F.S.†	4	113	98	94
Kings County	4	110	101	90
I.V.F.S.‡	5	111	93	74
Average		114	115	104

* Severe scald infection
† West Side Field Station
‡ Imperial Valley Field Station

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A new technique for determining COMPOSITION OF OILSEEDS *before planting*

D. M. YERMANOS

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.

A NEW 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 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. Prolonged 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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