With pectins, several workers have attempted to relate gel-forming capacity to some one factor—like degree of esterification[8] or equivalent weight.[9] The absence of methyl ester groups in tamarind seed preparation as also other recent evidence[7, 10] would, however, suggest that there is possibly little correlation between jelly strength and methoxyl content.

Pectins have the peculiarity of possessing a variable equivalent weight or degree of acidity depending upon their extent of esterification.[9] Tamarind seed meal preparation contains 20 milli-equivalents per cent. of free carboxyl groups. Whether these or the presence in it of albuminoids have any relation to its gel-setting property are being investigated as also its chemical composition through a study of its hydrolysis and oxidation products.

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1 Ghose and Krishna, *Jour. Ind. Chem. Soc*, *Ind. and News Edn.*, 1942. **5**, 114. 2. Ehrlich, summarized in *Abderhalden's Handb. biol. Arbeitsmeth. Abt. XI*, 1503, 1936; Schneider and Fritschi, *Ber.*, 1936, **69B**, 2537; Hirst and Jones, *Jour. Chem. Soc.*, 1939, 452, 454. 3. Nanji, Paton and Ling, *Jour. Soc. Chem. Ind.*, 1925, **44**, 253T. 4. Schryver and Haynes, *Biochem. Jour.*, 1916, **10**, 539; Tutin, *Biochem. Jour.*, 1922, **16**, 704. 5. Carre and Haynes, *Ibid.*, 1922, **16**, 60. 6. Link and Dickson, *Jour. Biol. Chem.*, 1930, **86**, 491. 7. McCready, Owens and Maclay, *Food Industries*, 1944, **16**, 794, 906; also *Ind. Eng. Chem.*, 1944, **36**, 936. 8. Buston and Nanji, *Biochem. Jour.*, 1932, **26**, 2090. Hinton, *Dept. Sci. and Ind. Res. (Brit.) Food Investgns, Special Reports*, No. **48**, 1939. 9. Hinton, *Biochem. Jour.*, 1940, **34**, 1211. 10. Bennison and Norris, *Ibid.*, 1939, **33**, 1443.

USE OF EVERS' MODIFIED BELLIER'S TEST FOR DETECTION OF ADULTERATION OF SESAME OIL WITH NIGER-SEED OIL (*Khursani, Kala-til, Surguja*)

IN the course of our investigation regarding the detection of adulteration of sesame oil with various inferior edible oils in this city, we are generally confronted with admixture of sesame oil either with groundnut oil or niger-seed oil. This led us to apply successfully the Evers' modified Bellier's Test to ascertain proportion of groundnut oil adulteration in sesame oil. The same test is applied for the detection of niger-seed oil in sesame oil. The range between the turbidity temperatures of sesame oil and niger-seed oil is, however, small. The following are the results of turbidity temperatures and refractive indices at 40 C (Z.B.), corresponding to the different percentages of niger-seed oil present in sesame oil.

Approximate percentage of niger-seed oil present corresponding to temperatures of turbidity

Oil	Turbidity Temparature	Refr. Index at 40 C (Z, B)
Sesame ..	15—16	59·5—60
,, + Nigerseed— Oil 25% ..	18	60·5
,, + ,, 50% ..	19·5	61·0
,, + ,, 75% ..	21	62·0
Niger-seed Oil ..	22·5	63·0

This test supplemented with refractive index enables the analyst to ascertain whether sesame oil is adulterated with groundnut oil or niger-seed oil and also to ascertain the proportion of the adulterant, because the refractive index of groundnut oil is lower (55·5) than that of sesame oil, while refractive index of niger-seed oil is higher than that of sesame oil. Even if admixture of sesame oil with groundnut and niger-seed oils has been so manipulated that it indicates the refractive index of pure sesame oil, the turbidity temperature of such a product will be much higher than that of pure sesame oil. Thus this test is very convenient and useful for routine analysis. In this part of the Province, niger-seed oil is frequently used for adulterating sesame oil, because the former is much cheaper than the laltter.

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February 28, 1945. A. H. PATEL.

THE UTILISATION OF SURPLUS RIVER WATER DURING THE MONSOON IN CROP PRODUCTION

DURING the monsoon Indian rivers run usually at flood levels, but owing to the maldistribution of rainfall many unirrigated areas frequently suffer extensive crop failure of the *kharif* (summer crops, such as rice, cotton, millets, pulses, maize, etc.) as well as of the *rabi* (winter crops, such as wheat, barley, gram, etc.) The cultivated area dependent on rainfall or *barani* conditions is about 161·18 million acres and is generally estimated to be about four-fifths of the total cultivated area of 208·72 million acres in India. In the unirrigated areas successful *rabi* crops such as wheat, barley, gram and other winter pulses as well as some oil-seeds depend on (*a*) adequate depth of moisture in the soil resulting from monsoon precipitation and (*b*) adequate moisture near the soil surface for seed germination at sowing time in late October or somewhat later. The failure of the winter crop in unirrigated areas may, therefore, arise from a failure of (*a*) or (*b*) or from both these causes. Failure of (*b*) means that the area cannot be sown, which means that the following winter rains will be wasted, as there will be no crop standing to utilize them. Experiments at Karnal and Delhi show that these failures can be prevented by the use of surplus river

Average yields of crops in maunds per acre (1 maund = 82 lbs.)

		Karnal			New Delhi		
		1941–42	1942–43	1943–44	1941–42	1942–43	1943–44
Wheat	Flooded ..	14·88	19·91	17·12	..	9·02	5·07
	Rainfed ..	5·45	17·41	9·92	..	9·20	2·75
Barley	Flooded ..	17·39	17·52	34·66	..	26·21	9·84
	Rainfed ..	9·94	16·60	16·52	..	22·83	12·07
Gram	Flooded ..	15·94	17·50	16·88	7·50	10·76	7·34
	Rainfed ..	0·97	14·71	13·40	3·32	10·45	3·22

water which now runs to waste in the sea. By flooding the land once only in early September, when plenty of surplus water is available, and without any further irrigations, the yields obtained during the last three years have been given in the above table.

The differences in yields are apparent in 1941-42 and 1943-44, but in 1942-43, a year of heavy monsoon rainfall (32·7 inches at Karnal and 26·9 inches at New Delhi), the differences are, as may be expected, of a lower order.

Growth of deep-rooted grasses in the grazing areas can be assured in years of deficient rainfall by the use of the surplus water which is now wasted. Canalization of the areas to use this water coupled with measures to conserve rainfall would assure the *kharif* crop completely and would result in the stabilization of *rabi* crop production on a higher level in these precarious areas.

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April 22, 1945.

PREVENTION OF DAMAGE TO STORED POTATOES BY THE POTATO TUBER MOTH

IN *Current Science*,[1] Rahman publlished some resutls of his experments on the storage of potatoes and damage by the tuber moth, *Gnorimoschema operculella* Zell. In view of the seriousness of the tuber moth problem nearly all over India, the problem has been re-examined.

The results given by Rahman show:—

(1) marked difference in moth damage between covered and uncovered potatoes;
(2) little significant difference in damage covered by the seven materials used, either by moth or by rot;
(3) none of the seven materials used, has any superiority, in preventing rotting;
(4) the figures for moth damage in respect of covered potatoes on the racks and on the *pucca* floor are too eratic to lead to any definite conclusion.

Rahman's statement, therefore, that the percentage of losses due to moth attack as well as rotting was higher when potatoes were stored on the floor than when they were stored on racks and that saw dust, Lantana leaves, local grass and *bhusa* gave good results, is not borne out by his data. Indeed his only finding appears to be the well-known fact that covering potatoes with some suitable material minimises moth attack.

Lefroy and Evans (1910) experimented on potato storage at Pusa; these were repeated in certain areas in the Central Provinces. They concluded that the most effective and inexpensive method of storing potato against moth attack and rotting, was to keep them covered under a layer of sand and to examine periodically, specially during the rainy season, and pick out the attacked or rotting potatoes. This method has given varying degrees of success, depending, it appears, largely on the correctness and efficiency with which the method has been practised.

Following Rahman's clue, a laboratory experiment was conducted at Cawnpore in which lots of 16 potatoes were kept covered with sand, ash, saw dust, *bhusa*, ash mixed with lime, Lantana leaves and *Murraya koenigii* leaves, together with one lot uncovered as Control and exposed equally to the tuber moth attack. The experiment lasted from 14-9-1944 to 2-3-1945. The results have shown that potatoes, covered with sand, ash and ash mixed with lime, remained completely free from moth attack while other lots suffered heavily. The percentage of moth-attacked and rotten potatoes under Lantana leaves was 91·0 and 47·9 respectively against 0·0 and 8·3 under sand and 0·0 and under ash. The experiment is being repeated on large-scale and a full account of both may be published at a later stage.

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March 28, 1945.

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THE CHROMOSOME NUMBER OF *SACCHAROMYCES CEREVISIAE*

AFTER a survey of our knowledge of the cytology of yeasts Kater[1] concludes that while amitosis is of doubtful value as a process occurring during budding "the burden of proof still rests with both sides". We would like to add that an explanation should also be given as to why the chromosome number is given by Badian[2]