TABLE I

Gain in N-fixed g.C in liquid medium at different pH range by Azotobacter chroococcum

Sl. No.	pH range	5·5	6·0	6·5	7·0	7·5	8·0	8·5	9·0	9·5
1.	Gain in N-fixed (*a*) With 0·2% salt ..	5·86	8·30	11·76	12·36	12·40	12·04	12·46	11·76	No growth
2.	Gain in N-fixed (*b*) Without salt ..	5·80	8·35	11·90	12·60	12·30	12·30	12·50	11·50	No growth

TABLE II

Soil characteristics and nitrogen fixation by Azotobacter chroococcum

Sl. No.	Soil texture	Org. C%	pH	T.S.S. mg/100 g soil	$CaCO_3$ %	Amount of N-fixed/g soil* (uninoculated) in mg			N-fixed/g* soil (inoculated) in mg
						Treated	Control	N-gain	
1.	Sandy loam ..	0·745	6·2	70	2·68	5·24	1·42	3·80	6·5
2.	Sandy loam	0·512	7·6	35	0·56	4·80	1·40	3·40	6·2
3.	Sandy loam ..	0·416	8·2	184	32·5	4·56	1·42	3·14	6·7
4.	Sandy loam ..	0·212	8·5	95	44·6	4·38	1·40	2·98	4·7
5.	Silty clay loam ..	0·590	8·8	195	38·0	4·43	1·40	3·43	6·3

* 100 ml Ashby's mannite solution containing one gram soil was incubated.

at varying amounts of $CaCO_3$ (nil to 44·6% of the soil). In liquid medium with 0·2% NaCl, the gain in N-fixed was quite high in the pH range 6·5 to 9·0. It gradually decreased below pH 6·5 and the isolate could not grow either at pH 5–0 or at pH 9·5. Mischustin and Shil'nicova (1971)[2] have also mentioned that *Azotobacter* fails to grow above pH 9·0 and below pH 5·4.

The culture may be tried successfully for enriching soil N in calcareous and non-calcareous soils as well as in the saline-alkali soils.

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PERSISTENCE OF TEMIK (ALDICARB) IN SOIL AND ITS RESIDUES IN BHENDI FRUITS (*ABELMOSCHUS ESCULENTUS*)

TEMIK [2-methyl-2-(methylthio) propionaldehyde O-methyl carbamoyloxime] is an effective insecticide against many sap feeding pests of crops. It is mainly applied to soils as 10% granules. The persistence and degradation in soil and the resultant bioactivity may depend on the type of soil, soil moisture, crops grown and other associated factors. Therefore the present investigation was aimed to assess the persistence of aldicarb in clay loam soil planted with bhendi crop and its residues in bhendi fruits.

A field experiment was laid out with soil treatments of 0·5 and 1·0 kg ai/ha of aldicarb applied at the time of sowing of bhendi seeds (Pusa Savani). The field was of clay loam type with a pH of 7·9 and organic matter content of 0·25%. Composite soil samples were collected from each treatment on 1, 15, 30. 45, 60 and 75 days after application. Bhendi fruit samples were collected on 50 and 55 days after sowing. Both soil and fruit samples were

analysed for Aldicarb residues (Jhonson and Stansburg, 1966). The Aldicarb content of soil residues are presented in Table I.

TABLE I

Days after application	Residues of Aldicarb (ppm)	
	0·5 kg	1·0 kg
1	1·35	2·12
15	0·26	0·73
30	0·19	0·60
45	0·09	0·42
60	0·05	0·11
75	ND	0·09

The results indicated that the insecticide had persisted in soil up to 60 days for 0·5 kg ai/ha and 75 days for 1·00 kg ai/ha and the levels of residues were 0·05 and 0·09 ppm respectlvely. The degradation in the first fortnight was very rapid and thereafter the dissipation was gradual. Studies conducted by Andrews *et al.* (1971) with S-methyl C^{14} aldicarb also revealed that 0·05 to 0·07 ppm of aldicarb were detected after 90 days of application in sandy loam soil. Bull *et al.* (1970) in their studies with S^{35} aldicarb and highlighted the importance of soil texture and moisture content of soil. There was no difference due to pH but at 100% field capacity moisture level the decomposition to non-toxic products was rapid.

The results of aldicarb residues in bhendi fruits are presented in Table II.

TABLE II

Pickings	Residues in ppm		Tolerance level in ppm
	0·5 kg	1·0 kg	
I picking (50th day)	0·12	0·17	0·20
II picking (55th day)	0·08	0·13	0·20

The results revealed that for both the doses, the residues in fruits were found to be less than the permissible tolerance level of 0·2 ppm as fixed by the FDA of USA and hence can safely be used for the plant protection work of bhendi crop.

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FAILURE OF THE DEOLONE ROAD BRIDGE ON THE SONE RIVER, SHAHDOL DISTRICT, MADHYA PRADESH

THE Deolone road bridge situated on the Sone river, in Shahdol District, Madhya Pradesh, failed on August 22,, 1975, during floods after 25 years of service. It was 230 m. long and 12 m. high multispan bridge which stood on 21 tough cement concrete piers. It broke so badly, that right abutment and adjacent 19 piers have been knocked out. Out of the broken piers, 7 are holding ground, while all the others appear to have succumbed to the scouring action of the flowing water.

The Deolone bridge was aligned across the strike of the country rocks, so that different rock types are met with, along its foundation. The main rock-types present are quartzites, shales and limestones, all belonging to the Basal stage of the Semri Series (Lower Vindhyan). They are dipping at 70° to NW. Only 200 m. downstream of the bridge, the Sone river turns abruptly and cuts across the quartzite ridge forming a water-gap. On examination, this water-gap was found to have been formed along a transverse shear-zone[1] in the rock-beds.

The nature of the Sone river course in this area has been studied by the author and it is found that the river is engaged in down-cutting its channel[2]. The thinly bedded shales which exist in the river-bed along the Deolone bridge, are very weak and disintegrate easily into small fragments. It is therefore sensitive to the scouring action of the flowing water. Further, as the shale strata are steeply inclined and disposed parallel to the flow of the water, the rate of erosion has been comparatively rapid. A transverse shear-zone exists in the rock-beds just down stream of the bridge, where the river takes a sharp turn in an effort to follow it. A 24 m. deep pool is dug up by eddying currents in the shear-zone which has supported the bed erosion near the bridge.

The position of the right abutment of the Deolone bridge was critical, because it was placed near