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Residual Effect of Simazine on Succeeding Crops

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Persistence of simazine when applied to forage maize crop, at 1 kg a.i/ha and its effect on the succeeding crop has been studied. Even sixmonths after the application, the percentage of mortality of crops after sowing was 91, 75, 26, and 0 in pearl millet, sorghum, finger millet and maize respectively. In plots nine months after application, the mortality of plants after sowing was as high as 57.5 per cent in little millet, followed by common millet (36), Sesamum and castor (39), sunflower (36), Italian millet (30-33), pulses (1-21) and cotton (9). The persistence of simazine eliminated 54 to 78 per cent dicot weeds but this helped in the increase of monocot weeds.

Herbicides are essential tools of modern agriculture. The injudicious use of herbicides may affect the succeeding crops. Chandra Singh and Subba Rao (1969), and Tripathi and Moolani (1972) studied the residual effect of simazine on the succeeding crop of wheat and pea while residual effect of atrazine was reported by Gupta and Dhupia (1970), Mcintyre (1971) and Gupta (1972). To find out the residual toxicity of simazine on succeeding crops, studies were carried out in Tamil Nadu Agricultural University, Coimbatore and the results are reported here.

MATERIALS AND METHODS

Trianthema portulacastrum was the most predominant weed in the field occupying nearly 90 per cent of the total weed population. The other major weeds seen in the field were *Digera arvensis*. Forsk., *Cynodon dactylon* Pers., *Cyperus rotundus* L., and *Echinochloa crus-gall* Beauv. Simazine was applied (as pre-emergence) at 1 kg a.i./ha to fodder maize on December 1972. After harvesting the fodder maize on February 1973, the field was ploughed and prepared and maize, finger millet, sorghum, pearl millet seeds were sown in 3 m x 3 m plots with two replications. The crops were sown three times (5,6 and 9 months after simazine treatment) adopting recommended spacings for all crops. These crops were also raised simultaneously in the untreated area of the field as controls. The soil type was clay loam with pH 7.8.

RESULTS AND DISCUSSION

Mortality of crops and weed counts were taken periodically from the individual plots and the mean values are presented in Table I.

Simazine application at 1 kg a.i/ha had residual toxicity up to six months and affected seriously the pearl millet and sorghum than finger millet and

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TABLE I. Mortalijy of crops and weed count

No. of month after simazine application	Mean mortality (Per cent)				No. of weeds/m²			
					Dicot		Monocot	
	Maize	Finger millet	Sorghum	Pearl millet	Control	Treated	Control	Treated
5 Months	—	33	81	100	118	9(7.6)	17	43(253)
6 Months	—	26	75	91	125	27(21.6)	15	52(347)
9 Months	—	—	26	8	123	69(56.4)	19	63(332)

(The figures within parenthesis indicate percentage.)

maize. Though germination of finger millet was not affected much its subsequent establishment was poor. Simazine had toxic effect on dicot weeds and controlled 92, 78 and 44 per cent of dicot weed population after 5th, 6th and 9th month of its application respectively. However, it is interesting to note that monocot weed population was found to be constant in control plots whereas it had increased in simazine treated plots showing that if the dicot weed population is minimised, monocot weeds will flourish. So, weed control programme should be formulated to check both monocot and

TABLE II. Mortality of crops sown 9 months after simazine application

Crop and variery	Mean mortality (%)
Little millet (CV) Co. 1 (*Panicum miliare* L.)	57.5
Little millet (CV) Co. 2 (*Panicum miliare* L.)	57.5
Common millet (*Panicum miliaceum* L.)	35.1
Italian millet (CV) Co. 3 (*Setaria italica* Beauv.)	30.0
Italian millet (CV) Co. 2 (*Setaria italica* Beauv.)	33.0
Sunflower (*Helianthus annuus* L.)	36.0
Sesamum (CV) K.R.R.2 (*Sesamum indicum* L.)	39.1
Castor (CV) S.A. 1 (*Ricinus communis* L.)	38.5
Blackgram (CV) PLS. 360 (*Phaseolus mungo* var. *radiatus* Linn.)	21.4
Blackgram (CV) Co. 3 (*Phaseolus mungo* var. radiatus Linn.)	12.5
Greengram (*Phaseolus aureus* Roxb.)	15.7
Cowpea (*Vigna sinensis* Savi.)	20.0
Pigeon pea (CV) SA. 1 (*Cajanus cajan* L. Millsp.)	6.7
Pigeon pea (CV) Co. 1 (*Cajanus cajan* L. Millsp.)	1.0
Cotton (CV) MCU 5 (*Gossypium hirsutum* L.)	9.0

dicot weeds, without affecting field crops.

The residual effect of simazine was also studied for 9 months after its application in the case of other crops (Table II).

High mortality upto 57.5 per cent was recorded for little millet followed by common millet, Italian millet, sesamum, castor, and sunflower. Pulses and cotton had lesser mortality and they can be safely cultivated nine months after simazine application. Similar observations were found with maize, sorghum, pearl millet and finger millet. The present study revealed that utmost care should be taken in selecting suitable succeeding crops to over come the residual toxicity of simazine.

REFERENCES

CHANDRA SINGH, D. J. and I. V. SUBBA RAO. 1969. Residual effects of herbicides in soils. *Andhra agric. J.* **26**: 112.

GUPTA, O. P. 1972. The effect of atrazine in maize-wheat rotations. *PANS* **18** : 290-91.

GUPTA, O. P. and B. K. DHUPIA. 1970. Direct and residual effect of atrazine as affected by variations in doses and its mode of application to maize in a maize - wheat rotation. *Indian J. Weed Sci.* **2**: 37-43.

McINTYRE, B.L. 1971. Persistence of atrazine (2-chloro-4-(ethylamino) - 6 - (isopropylamino)-S-triazine) as influenced by population densities of corn (*Zea mays* L.) hybrids. *Dissertation Absts. Int.* B. 32 : 1959.

TRIPATHI, H. P. and M. K. MOOLANI. 1972. Effect of simazine and atrazine under different levels of organic matter on maize and their residual effect in succeeding crops. *Indian J. agric. Sci.* **42** : 604-09.