

A NOTE ON LIQUID FERTILIZER FROM SHRIMP AND FISH WASTES

The rapid increase in the volume of export trade in canned and frozen prawns over a decade presents now the problem of disposal of very huge quantity of head and shell wastes. Presently a small portion of it is converted into meal by drying and powdering, the rest being either thrown away or in limited cases, used as manure. Decaying proteins and other odour-producing materials in shrimp waste cause striking smell unless it is processed immediately. Modern trends in agricultural practice are to use fertilizers of particular NPK ratios for particular crops and hence the use of shrimp waste or fish waste alone as a manure is not satisfactory as shown by the analysis of shrimp and fish waste samples (Table I).

TABLE I ANALYSIS OF SHRIMP AND FISH WASTES

	Fish wastes	Shrimp wastes
Moisture %	53.750	75.930
Nitrogen %	2.658	2.0808
Phosphorus as P ₂ O ₅ %	1.083	0.6560
Potassium as K ₂ O %	0.3225	0.04983
N:P:K	8:3:1	42:14:1

Preparation of a soluble fertilizer from shrimp waste by enzymic hydrolysis and addition of urea, phosphoric acid and potassium hydroxide to obtain an appropriate NPK ratio has been reported from Canada (Idler and Schmidt, 1955). The present note reports a simple method of preparation of liquid fertilizer of two different NPK ratios suitable for common crops of Kerala like coconut, arecanut, ginger tapioca, pepper and vegetables. Any other precise composition can be obtained by suitably varying the compo-

sition of materials used. The process is characterised by the simplicity of the procedure and the low cost of the raw materials involved. The method is equally applicable for the preparation of liquid fertilizer from shrimp waste and fish waste or combination of both.

The procedure employed was as follows: Prawn waste was mixed in appropriate proportion with fish waste and an equal amount of water by weight was added. The slurry was made highly acidic (pH 2.0) by the addition of required

TABLE II COMPOSITION OF FERTILIZER

	I	II	III	
Prawn waste	700	500	—	Stage I Acid Digestion
Fish waste	300	500	1000	
Water	1000	1000	1000	
Hydrochloric acid	500	500	500	
Potassium Hydroxide	40	15	75	Stage II Alkali Digestion
Sodium Hydroxide	30	40	—	
Water	1000	1000	1000	
% Digestion	85	90	100	
N:P:K Ratio	8:8:16	7:10:5	8.8:16	

I and III Mainly for coconut, arecanut (also for ginger & tapioca) II Mainly for vegetables, also for pepper.

TABLE III CHEMICAL COMPOSITION OF FERTILIZERS

	I	II	III
Moisture %	85.90	88.00	84.43
Nitrogen %	0.451	0.6069	1.12
Phosphorus as P ₂ O ₅ %	0.6576	0.680	0.9344
Potassium as K ₂ O %	0.371	1.106	1.807

quantity of concentrated hydrochloric acid and kept upto 5 days. The mass was then filtered and the filtrate separately kept. The residue was again digested with calculated amount of a mixture of sodium and potassium hydroxides (sufficient to neutralise the acid remaining in the filtrate and residue and to bring up the amount of potassium to the required level) and sufficient amount of water for two days. It was again filtered and the filtrate separately kept. The filtrate from both the steps were mixed together conveniently before use to get the required NPK ratio. The residue from the above contained only chitin which could be utilised for the

production of glucosamine hydrochloride (Prabhu and Kamasastri, 1961).

In Table II are given three typical combinations of various ingredients for appropriate NPK ratios suitable for crops noted against each and in Table III, the chemical composition of the fertilizers made from the above.

REFERENCES

- Idler D. R. and Schmidt, P. J. 1955, *Progress Report of the Pac. Coast. Fish. Expt. Station*. No. 103. pp 16-17.
Prabhu P. V. and Kamasastri P. V. 1961, *J. Sci Ind. Res.* **20 D**, 466.

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