

“Effect of Agrochemical use in vegetable production: A situational study in a village of Cumilla district.”

Abstract

The excessive use of chemical fertilizers and pesticides has been a threat to agricultural production, soil and health. Present research was conducted mainly to focus the adverse impacts of pesticide use on human health and to describe the current status of pesticide use in Jaspur village of Cumilla district. Out of 65 households data were collected from 45, data were collected by using A direct interview method with a pretested questionnaire was used to collect the data.

The questionnaire included both structured and non-structured questions. It had been observed that a maximum of 52.5% farmers said that they were affected through mouth and breathing, 22.5% farmers were affected through eye, skin, mouth and breathing, 5% through eye, skin and mouth and 5% through mouth. The signs and symptoms of illness due to exposure of pesticides were burning/stinging/itching eyes, skin redness/white patches, cough, excessive salivation, nausea/vomiting, shortness of breath etc. About 37.50% respondents waited one week to collect vegetables after pesticide use. 77.5% respondents did not get any training about pesticide use as a result they were highly dependent on dealers. Lack of awareness was a great problem in this village. So in order to increase awareness farmer training was essential. Although this was a social study but it was observed that scientific study was required in this village.

Key words: Pesticide, Vegetable, Knowledge, Health problem.

Background/Statement of the problem:

Bangladesh is situated in tropical and sub-tropical climates. This climate is suitable for growing a large number of vegetables (1). Vegetables are a group of important crops which provide nutrients that is vital for health and maintenance of our body (2). The present rate of vegetable consumption (126gm per day per capita) is low than the minimum daily requirement of 400gm per capita as recommended by FAO and WHO (1). Most of the vegetables that are grown in Bangladesh are attracted by various pests (2). In order to control vegetable pests, pesticides are applied to the environment (3). Pesticide was introduced in Bangladesh in 1957 as an agricultural input. Pesticides become very popular to the farmers for mainly two reasons; firstly quick and visible effect on pest and secondly, more economic (10). In Bangladesh it has been found that yield of vegetable was much lower in non-treated plots compared to treated plots (4). But unfortunately this yield success was accompanied with various health problems. Applied pesticides spread in the environment affect the health of un-protected agricultural and industrial workers. There are three major routes of entry for pesticides that included contamination of the skin, lungs and the gut. Various health problems such as memory loss, loss of coordination, reduced speed of response to stimuli were outcomes from pesticides. Other problem included asthma, allergies, cancer, hormone disruption, fetal development and reproduction (Gillbert, 2012). Though pesticides are very harmful for health, these pesticides are now being used indiscriminately by the farmers of Bangladesh (7). Mollah (2000) observed an increase in use of pesticides by farmers in controlling pests throughout Bangladesh (8). Vegetables were sprayed

heavily up to the time of harvest, and then sent directly to market with no waiting period; moreover, many were consumed whole. These create a potential for pesticide residues causing negative health effects on consumers (9). Dey *et al.* (2013) found that excessive sweating; burning eyes and fatigue were reported by 26.3%, 24.4% and 18.8% of the farmers, respectively. The farmers of Bangladesh are not properly trained about pesticide use. By considering all these reasons the present study mainly aims to explain the adverse impacts of excessive and contaminated pesticide use on human health in Jashpur village of Cumilla district. Moreover, there were some specific objectives. These were :

1. To describe the current status of pesticide use in Jashpur village of Cumilla district.
2. To identify the knowledge level of farmers about health hazard due to pesticide use.

Methodology

The study was conducted in Jashpur village of Kalibazar union under Cumilla district where most of the farmers grow vegetables. A preliminary field investigation was conducted. During the study period the major vegetables such as sweet gourd, tomato, potato, bean, brinjal were on the field. Jashpur village is a small village of sadar upazilla of Cumilla district. The Jashpur village has 65 households. From 65 households data were collected from 40 households. Data were collected from the male member of the household using a direct interview method with a pretested questionnaire. After pretesting the questionnaire was modified by collecting background knowledge from the preliminary investigation. Then final questionnaire was prepared to collect information on pesticide use of vegetables. The questionnaire includes both structured and non-structured questions. The data were collected by stratified random sampling. Most of the respondents did not receive any training. Their knowledge level was not also up to the mark about health problem and how to use pesticide properly.



Fig. 1. Map showing Cumilla district

3. Results and discussions

3.1. General Characteristics of Respondents

Maximum (45%) and (32.5%) respondents were (middle) and (old) aged. Majority (75%) respondents had education up to class five only (12.5%) had education level (above ten). Maximum (90%) of the farmers were involved in agriculture (vegetable), (3%) of the farmers were involved in business (7%) farmers were involved in service. So most of the farmers were involved in agricultural activities. Most of the respondents that is (43%) had monthly income less than (10000) and only (3%) respondents had monthly income above (40000%). Maximum (50%) respondents had involvement in agriculture (above 20 years). So farmer's activity in agricultural sector was high. (32.5%) respondents produce winter vegetables, (12.5%) respondents produce both winter and summer vegetables and only (5.5%) farmers produce year round vegetables. So farmer's winter season vegetable production was high. Respondents produced vegetables both for household consumption and commercial purpose. Maximum number of respondents (47.5%) respondents used local seed, (37.5%) farmers use both local and high-yielding variety seeds and (15%) farmers use only hi-yielding variety seeds. It was noticed that (80%) farmers sell vegetable in local market and (20%) farmers sell vegetables in both local market and traders. Majority (80%) respondents sold vegetables in local market and (20%) respondents sold vegetables both in local markets and traders. All of the vegetable farmers consumed vegetables that they produce.

3.2. Cultivated vegetables by the respondents

Data contained in Table 1. indicates that farmers produce almost all types of winter vegetables. Besides these vegetables they also cultivate cabbage, taro, amaranthus etc.

3.3. Training Experience of the farmers:

Almost (77.5%) respondents said that they did not get any training. Only 22.5% vegetable farmers got training (production technology, appropriate pesticide uses, IPM etc.)

3.4. Types of fertilizer used in vegetables:

Figure (2) shows that maximum numbers of respondents (95%) used pesticides for vegetable cultivation, only (2.5%) used organic fertilizers and (2.5%) used both organic and inorganic(pesticide) fertilizers. So farmers mainly used pesticide in vegetables.

3.5. Commonly used pesticides in vegetables:

From the Figure 3 it can be observed that maximum vegetable farmers did not know about name of pesticide. They told that they collect pesticide from dealers and they use pesticide as told by the dealers. So maximum farmers had no proper knowledge about proper pesticide use.

3.6: Form of pesticide used in vegetables:

Figure4 shows that (55%) farmers used powder **form**pesticides and (45%) farmers used powder and liquid type pesticides.

3.7:Method of pesticide used in fields

Figure 5 shows that (95%) farmers used pesticides in vegetables by spraying, (2.5%) farmers used pesticides directly, and (2.5%) used pesticides both by mixing with water and powder type also.

Cultivated vegetables by the respondents	No of respondents	% of the respondents
Potato	1	2.50%
Tomato and Brinjal	1	2.50%
Tomato,Brinjal,Potato and bean	5	12.50%
Tomato,brinjal,potato,bean and sweetgourd	8	20%
Tomato,Brinjal,potato,bean,sweetgourd,other	4	10%
Tomato,brinjal,potato,bean and others	3	7.50%
Tomato,Brinjal,Potato and sweetgourd	1	2.50%
Tomato,Brinjal,bean	1	2.50%
Tomato,brinjal,bean and sweetgourd	2	5%
Tomato,brinjal and others	1	2.50%
Tomato and potato	2	5%
Tomato,potato and bean	2	5%
Tomato,potato,bean and sweetgourd	1	2.50%
Tomato,potato,bean and others	1	2.50%
Tomato,potato and sweetgourd	1	2.50%
Tomato,potato and others	1	2.50%
Tomato and others	1	2.50%
Potato,bean and others	1	2.50%
potato and sweetgourd	1	2.50%
potato,others	1	2.50%
Bean and sweetgourd	1	2.50%

Table1:Cultivated vegetables by the farmers during data cultivation

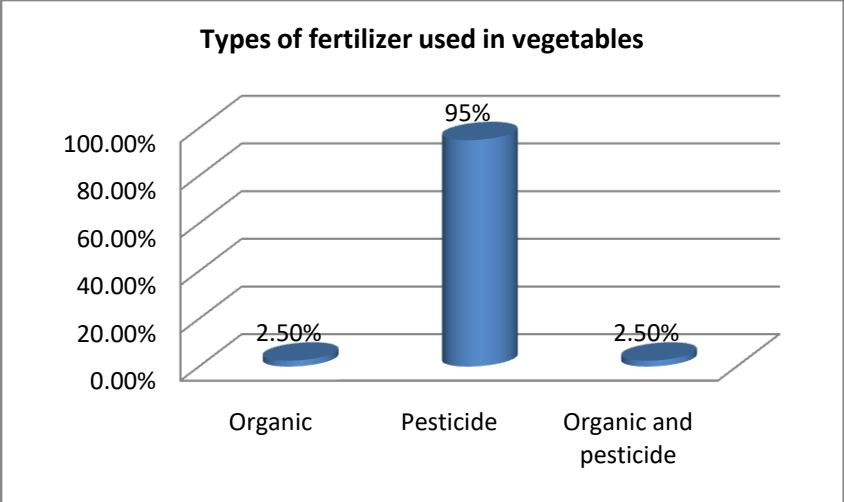


Fig 2: Types of fertilizer used in vegetables

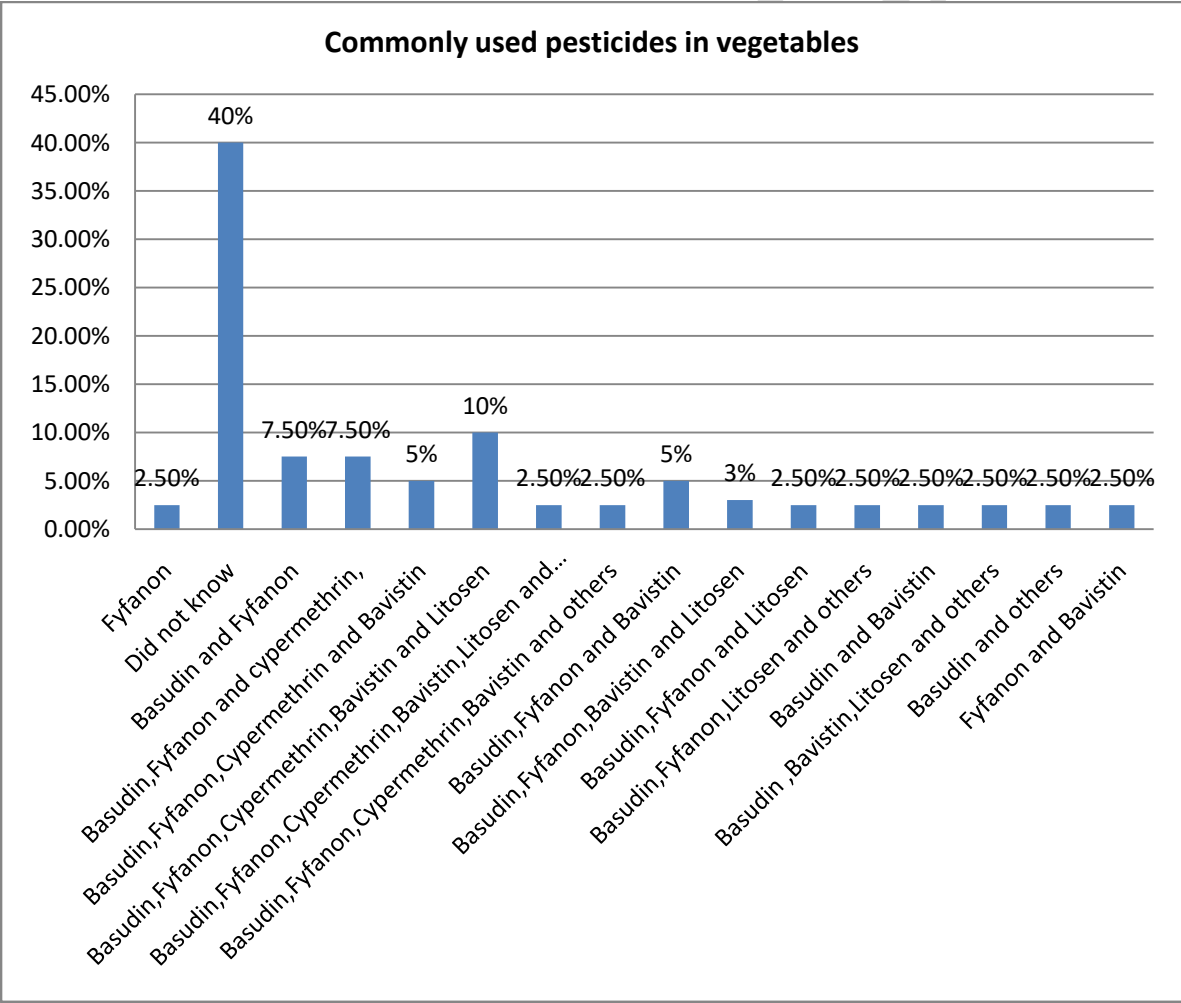


Fig 3: Commonly used pesticides in vegetables

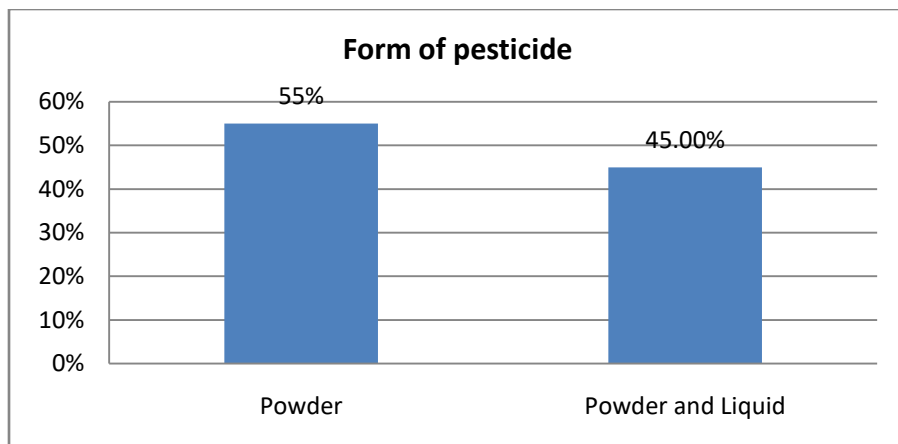


Fig 4:Formof pesticide used in vegetables

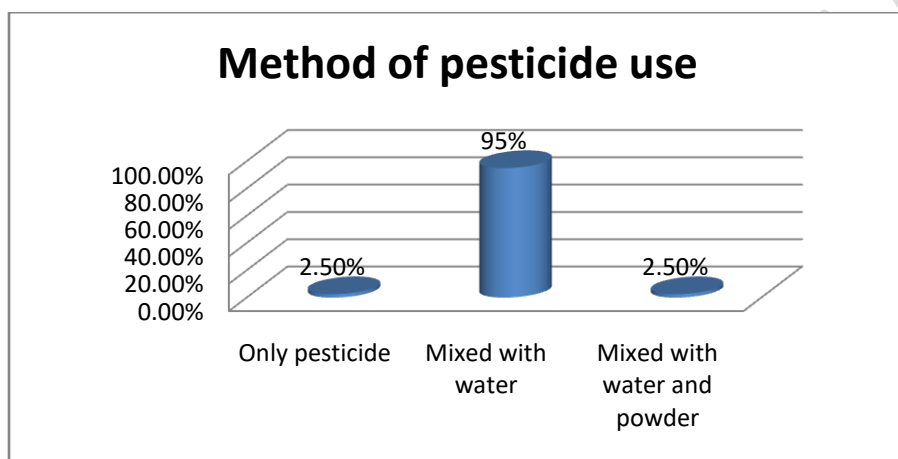


Fig 5:Method: of pesticide use

3.8 Maintenance of instruction for safe use of pesticide.

Fig6 shows that (60%) farmers had medium maintenance level of pesticide use instruction. About (20%) had high maintenance and (2.5%) had both high and medium level maintenance.

3.9. Farmers application patterns of pesticide

From Fig7 it can be observed that (60%) farmers applied pesticides weekly, about (27.5%) farmers applied pesticides(weekly 2/3 times), nearly (2.5%)daily), almost (2.5% both daily and weekly 2/3 times) and(7.5%) farmers applied pesticides by other means.

3.10: Farmers affected areas due to pesticide exposure

Almost (52.5%) farmers were affected through mouth and breathing (signs and symptoms cough ,excessive salivation, nausea/vomiting,shortness of breath), nearly(22.5%) farmers said they were affected through eye, skin, mouth and breathing(signs and symptoms

burning/stinging/itching eyes, skin redness/white patches, cough, excessive salivation, nausea/vomiting, shortness of breath), about (5%) through eye, skin and mouth (signs and symptoms burning/stinging/itching eyes, skin redness/white patches, cough, excessive salivation, nausea/vomiting) and nearly(5%) through mouth(signs and symptoms cough, excessive salivation, nausea/vomiting).

3.11. Duration of days waited by the farmers to collect vegetables after pesticide use:

Almost (37.5%) vegetable farmers waited one week after pesticide application, nearly(27.5%) farmers said they waited two weeks after pesticide application, about(22.5%) waited 2/3 days after pesticide application, nearly(10%)waited one day after pesticide application and 2.5% farmers applied pesticides(within 1-3 days).

3.12. Farmers knowledge about effect of pesticide exposure on human health.

About (52.5%)said that they know about health of pesticide, almost(37.5%) said that they partially knew about health problem about (10%) said that they did not know about health problem.

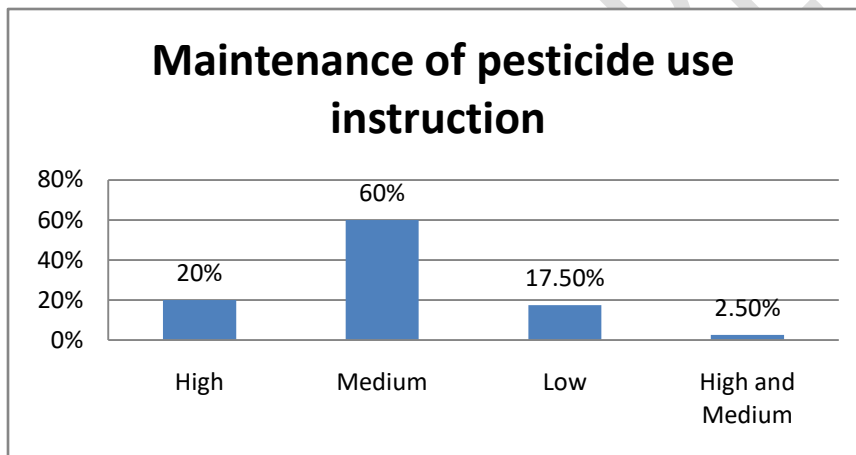


Fig 6: Maintenance of instruction for safe use of pesticide

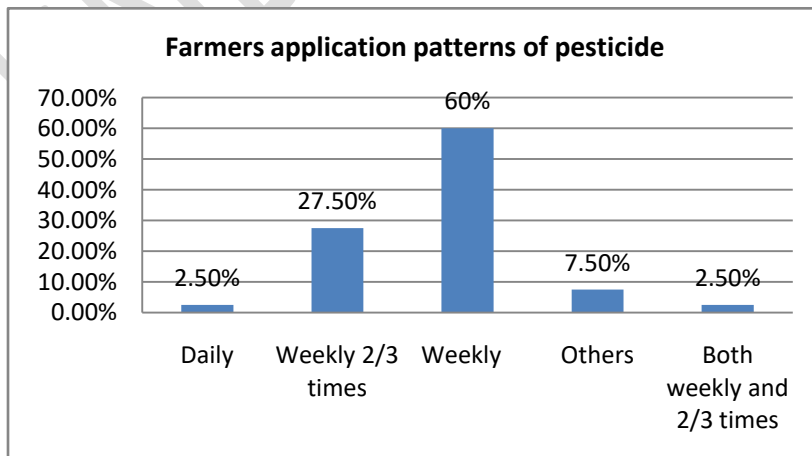


Fig 7 : Farmers application patterns of pesticide

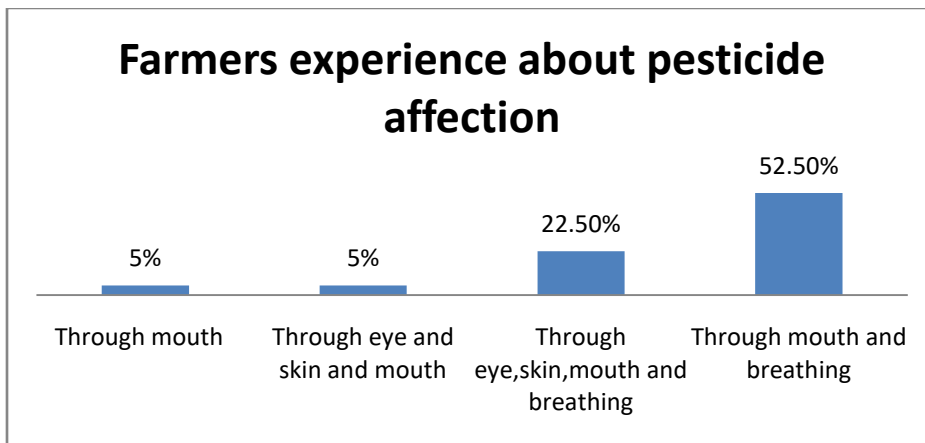


Fig 8: Affected areas by pesticides

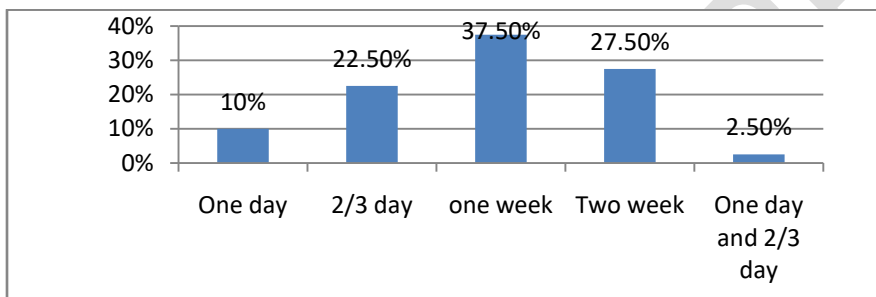


Fig 9: Duration of days waited by the farmers to collect vegetables after pesticide use:

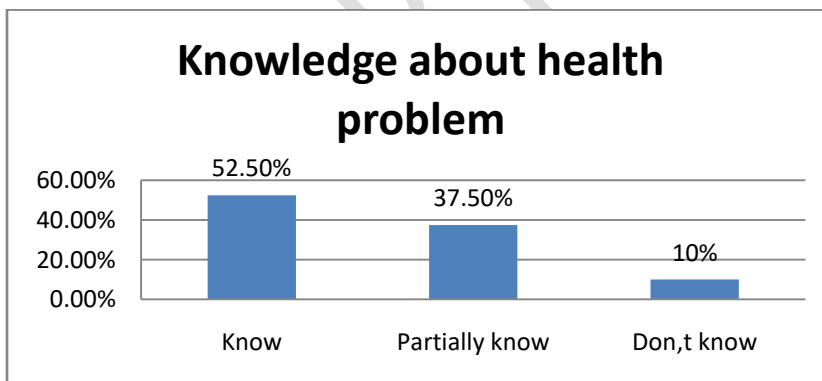


Fig 10. Farmer's knowledge about effect of pesticide exposure on human health.

3.13. Difficulties in vegetable cultivation:

Farmers mentioned difficulties were lack of capital, insufficient seed, lack of training, less rainfall, problems of loan collection from dealers, low production etc.

Conclusions and Recommendations:It was observed that farmers lack adequate knowledge about adverse impacts of pesticide use. This situation was due to the scarcity of training program.Farmerswere affected through eye, skin, mouth and breathing. Farmers experienced different signs and symptoms of illness due to exposure of pesticides such as burning/stinging/itching eyes, skin redness/white patches, cough, excessive salivation, nausea/vomiting, shortness of breath etc.

The government should arrange proper training programs for the farmers so that they could be aware about the negative impacts of pesticide on human health.Mask and appropriate clothing should be used by the farmers.Pesticides need to be sprayed very carefully.

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COMPETING INTERESTS DISCLAIMER:

Authors have declared that no competing interests exist. The products used for this research are commonly and predominantly use products in our area of research and country. There is absolutely no conflict of interest between the authors and producers of the products because we do not intend to use these products as an avenue for any litigation but for the advancement of knowledge. Also, the research was not funded by the producing company rather it was funded by personal efforts of the authors.

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