

CHEMICALS USED FOR GROWTH, RIPENING AND STORAGE OF LYCHEE IN BANGLADESH

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Abstract

The study was conducted on the chemicals used in lychee of 6 different areas in Gazipur and Rajshahi regions. The selected areas are Fruit Research Station, Bangladesh Agriculture Research Institute, Binodpur, Rajshahi-6206; Horticulture Centre, Rajshahi Court, Rajshahi; Horticulture Development Centre, Bangladesh Agriculture Development Corporation, Noudapara, Rajshahi; Dactar Bari Nursery and Dillar Bari Nursery, Moytha Para, Pirojali, Gajipur Sadar, Gajipur. In these areas several chemicals used like Ripcord, Fighter 25 EC (Emulsifiable concentrate), Cymbush 250 EC (Emulsifiable concentrate), Malathion 85E (Emulsifiable), Tilt 250 EC (Emulsifiable concentrate), Regent 4 SC (Suspension concentrate), Torque, Cyper TC (Technical material) Insecticide, Sulphur and acids, or Combinations, Ethephon solution, Sulphur dioxide, Solution of Chitosan and L-glutamic acid in lychee during growth, ripening and storage period. These chemicals help to control pest, insect and unwanted weed production, by providing good environment during growth and ripening period. Chemicals which used for storage purpose stabilize the color, maintain the moisture content and improve the quality of fruits. Other chemicals like Flora, Emcogen powder, Pranti-vita, Vio-fata used as vitamin after flowering which helps to grow, mature the fruit also prevent from virus attack or insects. It was observed that 87.5% chemicals were permitted while 12.5% chemicals were non-permitted. Among them chemicals namely Benomyl, Okojen, Boron and Zinc, have not been recently used. Okojen contain higher amount of Urea that is harmful to environment. These prohibited chemicals have terrible effect in our body and environment.

Keywords: Lychee, chemicals, growth, fruit, insecticide

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1. INTRODUCTION

The lychee (*Litchi chinensis* Sonn.) belongs to the family Sapindaceae and sub-family Nephelieae. It is one of the most important sub-tropical evergreen fruit trees which grow well in Bangladesh. Another member of the sub-family 'Anshphal' (*Euphoria longana* Lam.) also grows in Bangladesh, mostly in backyards. No authentic documentation on the history of cultivation of lychee in Bangladesh is available. However, it is believed that lychee came from Burma to Bangladesh sometime in the early 19th century. Chinese varieties along with Indian cultivars like Mujaffarpuri and Bombai were introduced in the early 20th century from West Bengal through the efforts of nurserymen and plant lovers.

Bombai is the oldest high yielding variety in the country, although there are a number of cultivars growing in different areas of

Bangladesh. These are Rajshahi, Madrajie, Madrajie-3, BAU, Mongalbari, Kadmi, and Kalipuri. Muzaffarpuri, Bedana and China-3. Recently three varieties, namely: BARI Lichu-1, BARI Lichu-2 and BARI Lichu-3 were released by the Bangladesh Agricultural Research Institute (BARI) for farmer's adoption. Among the released varieties BARI Lichu-3 is considered the best in respect of fruit size, pulp, color and yield. The variety closely resembles China-3 variety.

The aim of the study was to identify the chemicals used in lychee from growth to storage period and compile the information so that policy maker, agencies can take proper step to minimize chemicals utilization.

Lychee was found to grow well in the Government horticulture centers of three hill districts namely- Rangamati, Khagrachari and Bandarban and also in Rajshahi, Gajipur, Jamalpur, Rajbari, Meherpur, Chapainawabgonj and Comilla.

The expansion of the lychee area in these districts is relatively slow due to high mortality rate of young lychee plants. Most of the growers as well as extension agents do not have the required knowledge and skill in lychee cultivation as a result of which interested farmers very often fail to establish new orchards.

At present the total area under lychee cultivation is about 4,000-5000 hectares and total annual production is about 13,000 Tons.

Insect and mites pests problem related to litchi cultivation faced by litchi growers in Dinajpur area indicated that Burning of skin of the fruits, falling down of very young fruits, lack of marketing facilities, lack of purity of insecticides and other agricultural impute, absence of flowering of some litchi plants are major problems of the farmers. Thirteen types of insecticides were used by the farmers and 66% of them used Ripcord 10EC followed by Agromything (32%), Basudin 10G (6%). Removal of mite infested plant parts during fruit harvesting is also done by some (21%) farmers.

Liquid organic fertilizer-the Ocojeam was used as vitamin by 36% farmers and Folimore PGR (Triacantanol) by 30% farmers. The highest 41 % farmers took advice (information) for the control of insect pests from the dealer of insecticides and fertilizers and 38 % farmers use their own experience for the control of insect pest. J. Sci. Technol. (Dinajpur) Vol. 8: 128-134 (2010), ISSN 1994-0386. (M. A. Ahad et al., 2010).

Simple methods were done by the local lychee farmers to protect fruits from physical damage, insecticides during storage and transportation. Sorting and grading are carried out in shed to protect the fruits from elements. Bamboo basket, sacks are used as packaging material during handling or transportation.

2. MATERIALS AND METHODS

Type of study

An observational study was carried out in Rajshahi and Gajipur region of selected nursery and farms.

Selection of study areas

We visited Rajshahi and Gajipur region for our experiment according to their location, large scale production and economic condition of the inhabitants, easy communication, availability of the samples, less transport cost and other relevant factors. The nursery and farms include Fruit Research Station, Bangladesh Agriculture Research Institute, Binodpur, Rajshahi-6206; Horticulture Centre, Rajshahi Court, Rajshahi; Horticulture Development Centre, Bangladesh Agriculture Development Corporation, Noudapara, Rajshahi; Dactar Bari Nursery and Dillar Bari Nursery, Moytha-Para, Pirojali, Gajipur-Sadar, Gajipur.

Basis for selection of study place

Well communicated, give assurance from the authority for full co-operation and higher yield of lychee production area.

Study period

The survey was conducted from January 2015 to December 2015 in the selected nursery and farms both Rajshahi and Gazipur region. During this period data collection, data entry, data analysis and final report writing work completed.

Development of questionnaire

A standard enquires were prepared to get the relevant information about the study and 48 questions were included in questionnaire. The questionnaire was in English (Annexure) but conversation word was done in Bengali.

Data verification

Misinformation's were thoroughly observed after entering all data into computers. The data was elicited if there was problem (suspicion input, false input).

Data analysis

To analyze the collected data and the information, necessary statistical methods like tabulation was used. For analysis, visualization and meaning full information present MS Excel 2007 were used.

3. RESULTS AND DISCUSSION

Chemicals during growth period

Several chemicals namely Ripcord, cymbush 250EC, Melathion 85E, Regent 4SC etc are used in lychee. During growth period fruits are affected by pest and insects which hamper the production. Results show that, these chemicals provide a good environment by controlling pest and preventing excess weed for better production

Table 1: Name and function of chemicals used in lychee during growth period

Serial No.	Chemicals Name	Function
01	Ripcord	Grow flower, fruit by controlling caterpillar pest
02	Fighter 25 EC	Prevent from insects and weed production
03	Cymbush 250 EC	Helps to grow flower and fruit by preventing weed production
04	Melathion 85E	Effect in controlling insects and mites
05	Tilt 250EC	Fungicide resistance management
06	Regent 4SC	Effective pest control and superior seed safety.

Chemicals during ripening period

During ripening period some other chemicals used which helps to control insecticides. Torque, Cyper TC used in lychee which act against insects and provide proper ripening (Table 2).

Chemicals during storage period

Results show that chemicals used in lychee during storage to improve the color and quality.

Sulphur dioxide, Ethephone and some other solution used in lychee. This helps to stabilize the color and improve the quality of fruit. Some is found to maintain the moisture content and other enzymatic reaction (Table 3).

Table 2: Name and function of chemicals used in lychee during ripening period

Serial No.	Chemicals Name	Function
01	Torque	Control a wide range of insecticides
02	Cyper TC Insecticide	Used as an insecticide

Table3: Name and function of chemicals used in lychee during storage period

Serial No.	Chemicals Name	Function
01	Sulphur and acids combination	Stabilize red color of the pericarp.
02	Ethephon solution	Improve the quality and significant post-harvest ripening achieved
03	Sulphur dioxide	Give an artificial and persistent red color.
04	Chitosan and L-glutamic acid	Reduced water loss and significantly slowed browning
05	Benomyl	Slowed rot development.

Other chemicals

Other chemicals also used in lychee after rising flower and fruit. Some of them used as vitamin like pranti vita, vio-fata, okojen which helps to mature fruit and prevent from insects. They also used to prevent lychee from virus attack. Little of them have not been recently used due to their hazardous effect (Table 4).

Table 4: Chemical used after flowering, their function and effects

Serial No.	Name of chemicals	Duration of use	Function	Effect
01	Folimore PGR (Plant growth regulators)	After rising flower	Helps to grow fruit	No harmful effect
02	Emcogen powder	After rising flower (15-20 days)	Prevent from virus attack.	No harmful effect
03	Pranti-vita	After fruit rising in 15-20days	To mature the fruit.	No harmful effect
04	Vio-fata	After fruit rising in 20-25days	To prevent from insects.	No harmful effect
05	Okojen	After fruit rising in 30-35days	To mature the fruit.	Contains higher amount of Urea and hazardous to environment
06	Boron and Zinc, Super-action	After fruit rising in 20-25 days	In growth as a prerequisite for flower induction of lychee	Harmful to human health and environment.

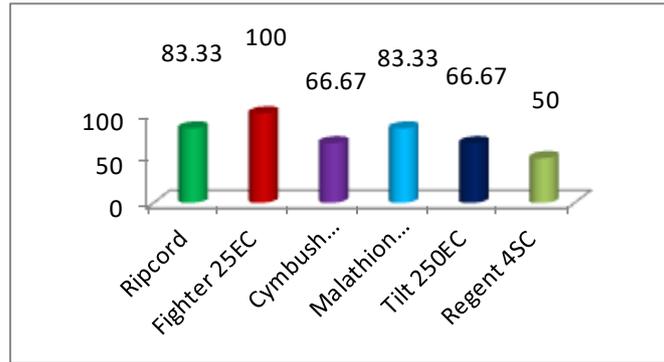


Figure 1: (%) during growth period

Figure 1 represents the percentage of chemicals used in lychee during growth period. It was found that Fighter 25EC was used in highest amount than other chemicals, the percentage of Melathion 85E is found similar to Ripcord where Regent 4SC used at lowest amount.

Figure 3 represents the percentage of chemicals used in lychee during storage period which shows Ethephon solution was used in highest amount than other chemicals, Sulphur dioxide is found similar to Sulphur and acid where Benomyl used at lowest amount.

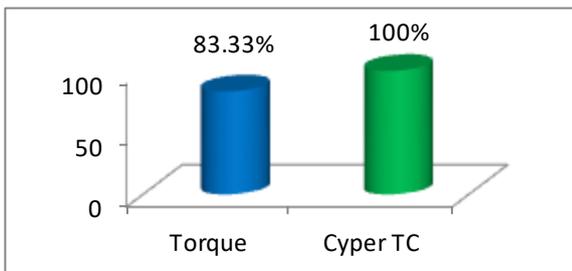


Figure 2: (%) during ripening period

Figure 2 represents the percentage of chemicals used in lychee during ripening period in which Cyper TC was used in highest amount in comparison to Torque.

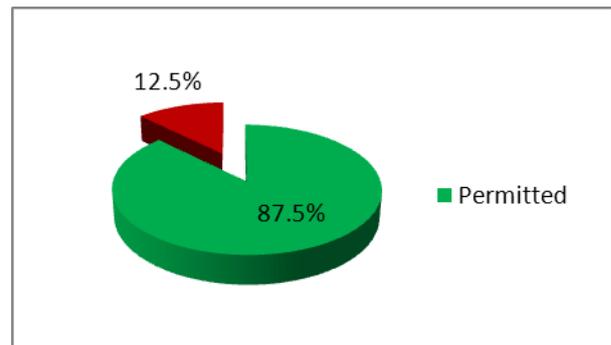


Figure 4: Chemicals used in lychee (Permitted and non-permitted)

Fig.4 shows the percent distribution of chemicals used in 6 different areas of Gajipur and Rajshahi regions. It was observed that 87.5% chemicals were permitted and 12.5% were non-permitted. The permitted chemicals were Ripcord, Fighter 25 EC, Cymbush 250 EC, Malathion 85E, Tilt 250 EC, and Regent 4 SC, Torque and Cyper TC Insecticide, Sulphur and acids, or Combinations, Ethephon solution, Sulphur dioxide, Solution of Chitosan and L-glutamic acid and non permitted chemical was Benomyl.

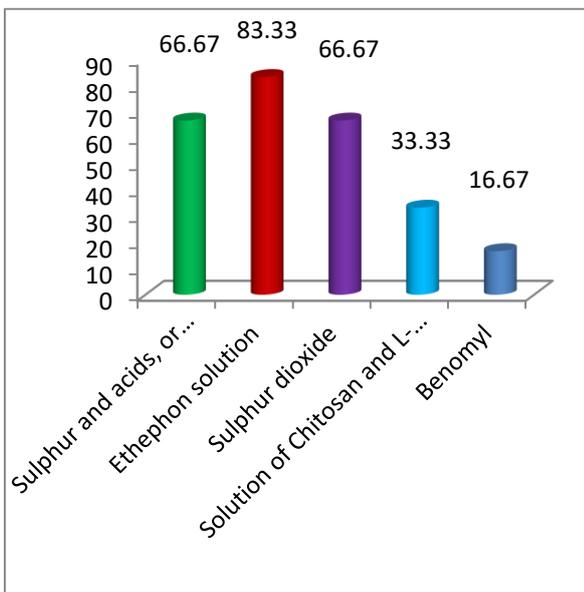


Figure 3: (%) during storage period

4. CONCLUSIONS

Four maize varieties: D1Y (DMR-LSR-Y), An observational study was carried out to find chemicals used in lychee. Nowadays chemicals used in lychee to increase volume and red

color. It is found that Fighter 25EC, Cyper TC and Ethephon solution was used higher amount in lychee during growth, ripening and storage period. Most of the chemicals used to grow fruit, improve the color and quality of lychee. They also helps to control pest, insects and prevent weed production. It was also found that 87.5% chemicals were permitted where 12.5% were non-permitted. Among them chemicals namely Benomyl, Okojen, Boron and Zinc, have not been recently used Okojen contain higher amount of Urea that is harmful to environment. Other chemicals like Flora, Emcogen powder, Pranti vita, Viofata used as vitamin after flowering which helps to grow, mature the fruit also prevent from virus attack or insects. Several nursery and farms used these non-permitted chemicals due to profit and higher yield. Some of them sprayed chemicals improperly due to lack of knowledge about the chemicals. Though these nursery and farms contact with the local agriculture officer but it is not always happen. These farmers used chemicals according to their own ways. This misuse practice of harmful chemicals is a great threat on the human health of our country. The current study was involves a small number of chemicals used in lychee. But it gives us a comprehensive picture to understand the extent and magnitude of the scenario so the government and other agencies can take necessary steps to prevent such types of chemicals used in lychee to safe guard public health.

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