

PERCEPTIONS ON PESTICIDES WITH PARTICULAR REFERENCE TO THE PHILIPPINE SETTING

By
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Pesticides have continued to be controversial, seemingly surrounded by a mystique all their own, and leaving people in a quandary whether to condemn or praise them. Indeed, throughout history situations have arisen wherein pesticides were praised but probably just as many were situations which caused man to curse them.

In the four decades that the synthetic insecticides have been used, man has not yet fully understood them and the roles they should play in his life, in the advancement of his society. Is this state of affairs inevitable? Indeed, it is! And what could fuel the confusion more than the contradictory expectations, oftentimes laced with a little ignorance and a lot of bias. Looking back at the adversaries in the pesticide controversy, we can safely say that the positions taken were conditioned to a large extent by the sector of society to which one belongs.

It is the intention of this paper to bring out some aspects of the controversy, not so much to settle them but rather to spotlight them for further discussions. It is our belief that the controversy will always be with us and it is only through continuously analyzing the issues that we can better understand them. Of particular concern are the following.

1. Public perception of a pesticide and its usage.
2. Constraints in its acceptance and use especially in a developing tropical country setting.
3. Misconceptions and how they should be corrected.

GIVENS ABOUT PESTICIDES

Some aspects about pesticides are generally accepted.

1. They are generally subject to extensive tests on biological efficacy and safety prior to registration.
2. They are useful in the control of pests in crops, livestock, homes, public health, stored products, etc.
3. They could be hazardous to man and his environment.
4. Handlers are exposed to greater risks than the general public.
5. Regulatory approaches vary among countries.
6. Developing countries are ill-equipped/staffed to carry out the same magnitude of controls as developed countries.
7. Safety in usage is directly related to level of knowledge of the user.
8. They are made available by profit-oriented companies of widely differing sizes.

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EXPECTATIONS ABOUT PESTICIDES

Built into the pesticides are differing, even contradictory, expectations from different sectors. This is indeed ironic and could be a major reason for the adverse reaction towards these compounds by many people. For purposes of our discussions, let us limit ourselves to the user, supplier, and environmentalist sectors.

While a cheap compound is desired by farmers/users, this expectation may not be compatible with the high profit margin desired by the supplier sector. For the latter sector, low price is something that could result only from a) competition and b) large sales volume which would offset the low profit margin.

The user sector does not mind if the profit margin is high as long as the pesticide is "cheap" by his economic standard. Nor does he complain when it is expensive — he simply uses less. Besides, he has nobody to complain to, more so, one that he knows could do something about high costs. With the economic crunch we are experiencing now, it is not surprising to hear of authoritative surveys showing gross underdosing and underapplication.

It is the consumer advocate who is quite vociferous about profit margins, yet nothing happens in this exercise, particularly here in the Philippines. One reason for this of course is the weak consumer movement in the country, this weakness being abetted by a society with a fatalistic attitude.

Related to the issue of cost is the desire of the pesticide manufacturer to hold on to their invention, forever if possible. Thus, a high-sales compound which cannot be synthesized by competitors after patent protection or cannot be registered for use by anybody else, would be most welcome. Such a compound however, is again not compatible with the expectations of the two other sectors because a monopoly always keeps prices at the highest possible profitability level. Definitely too, such a situation does not augur well for the Filipino entrepreneur who is still in the copying and mixing stage, a far cry from the inventing stage as far as pesticides are concerned.

Effectiveness against a variety of pests is desired by users but generally frowned upon by environmentalists who know that such a characteristic inevitably means that the compound will also affect non-target organisms. For our small farmers however, a narrow spectrum compound does not appear so practical especially if, as recommended by our policy planners, he has to diversify his crops. This means a variety of pests which, if he uses different compounds for each pest means a sizable inventory of chemicals (and investments). Even for a variety of pests, the farmer use the same insecticide. For him therefore, the use of a wide spectrum compound is desirable and practical.

From the standpoint of the supplier, a narrow spectrum compound would not be very desirable because it means limited applicability, thus also limited sales. Even if the target pest is quite serious and may result in immediate high sales volume, the supplier is always worried that resistance development may set in before he can even recoup his investment.

There also appears to be inconsistencies as regards persistence. The environmentalist wants a non-persistent compound so that its pollution

potential would be nil if possible. The supplier would have the same preference because more of a non-persistent compound would be used per unit time than a persistent one. For the user however, the desired degree of persistence depends on the pests that are being controlled — he would like a persistent insecticide for pests that can be controlled only by these types of compounds and a non-persistent compound if he has to apply close to harvest. He would also prefer to minimize the number of application per cropping season by using as persistent a compound as possible. On the other hand, it is now the consensus that a persistent compound hastens development of resistance to it, which again is inconsistent with the desire for an insecticide that will remain effective for a long time.

We are still a long way from resolving these inconsistencies. Probably, the most difficult to resolve is our concern that the introduction of new compounds remain unimpeded by giving adequate rewards to developers at the same time that we would like to make sure that this remains reasonable so that prices would be within the reach of farmers/users.

SOME ISSUES WORTH CONSIDERING

While the "givens" about pesticides seem to indicate that the situation is reasonably under control, there appears to be serious shortcomings in some activities/exercises if we take a close look at certain activities. Furthermore, some activities or beliefs considered wrong may prove to be advantageous after all. Let us now discuss each of these.

1. Safety tests

It appears that the public in general are ill-informed about the adequacy of the toxicological requirements that a pesticide must satisfy before it is granted registration in many countries. Does this mean that however that all the pesticides we are using should be declared safe or more correctly, not unsafe?

In the first place, the public in general does not seem to know what is meant by safety or the tests that a pesticide must pass in order to be given toxicological clearance. Furthermore, when it comes to the specifics of the tests, the public is ill-prepared to judge the value of contradictory results. For example, take the issue of carcinogenicity. Regulatory toxicologists agree that positive results on mice need to be confirmed with tests on another species before a compound is considered carcinogenic. Does the public or the vociferous rabble-rousers among us, know this or subscribes to this interpretation? One who is out to discredit pesticides can simply claim that Scientist A from Institution X found compound Z to be positive in carcinogenicity tests on mouse, have the statement published in the papers, and Z becomes branded as a carcinogen; sometimes the reference to mouse is conveniently omitted. Our regulatory agency then will be considered by many as criminally irresponsible for allowing that compound to be used.

Tests also have to follow certain protocols on 1) laboratory conditions and 2) the animals used. Of importance are the age, number, breed, nutritional status, and susceptibility of the animal. Test conditions include

presence of positive and negative controls, controlled temperature and adequate dosages. Failure in some aspects may be considered serious enough to invalidate the results. A scientific review therefore requires an evaluation beyond simply the numerical data. On the other hand, many of us are wont to quote published results without being able to see beyond the author's self-serving or biased conclusions.

Suppose inadequately supported or invalidated results are still reported in the papers, who are supposed to defend the compound? The pesticide industry, assuming that it could act as one, would not be a credible defender. If FPA comes to the defense it runs the risks of being pro-pesticide, their people would be suspected of being in the payroll of the pesticide industry, and so cannot be trusted with its mandate. The same criticism would be leveled on any other person, be they defending it out of their scientific knowledge with no commercial interest or for mercenary reasons.

In the case especially of the Philippine Pesticide Industry, member-companies appear concerned only with their products, so who would be expected to defend, say DDT, when despite the reviews of real expert groups, our own instant experts raise the issues already voided by the international group?

Adding to this rather messy situation, are the gray areas in toxicology. Let me just enumerate a few.

1. Importance of microbial and sub-mammalian tests for mutagenesis.
2. Relationship between benign tumors and cancer (malignant tumors).
3. The Acceptable Daily Intake concept.
4. Maximum Residue Limits.
5. Relationship between high dosages used in tests and low dosages under actual conditions.

We can see from here that if somebody wants to extrapolate microbial mutagenicity data to man, he/she is not entirely incorrect but this does not necessarily mean that he/she is correct. Thus, if a claim is made in public forums that a compound is mutagenic using say, the Ames test, sooner or later, the reference to the test protocol will be dropped and the compound is now branded as a mutagen.

Everyone concerned with pesticides, in fact everyone concerned with new technologies, have also failed to convince the public that trade-offs have to be adopted and that there is no such thing as a completely safe pesticide or for that matter complete safety. Thus, when adverse effects are observed, pesticides are being blamed — this is true even for suicide case or unfortunate episodes arising out of irresponsibility.

2. Corporate Public Image

Of late, this has suffered a beating with the surfacing of irresponsible acts. We have been treated to several examples.

a. Dumping of pesticides in developing countries — This strikes a very responsive chord in developing countries and so contributes significantly to the negative image of pesticides. What makes it worse is the fact that

in the developed countries where the pesticide is manufactured, these compounds are not allowed for use or are sometimes unregistered.

In cases where restrictions are adopted in developed countries, the question is, "should these same restrictions apply in developing countries?". Probably not. If we consider the lower degree of sophistication as regards pesticides in the latter, we may have to be stricter in developing countries.

What is funny, if not pathetic, is that when companies are caught red-handed with compounds "banned" in other countries, regulatory authorities still give them an honorable way out by using the phrase, "voluntarily withdrawn". Isn't this deceptive? And how is this distinguished from companies which really voluntarily withdraw their products from the market?

For the Philippines, the saving grace is the vigilant posture taken by the Ferlitizer and Pesticide Authority (FPA), *viz-a-viz* products already restricted in other countries.

The image of pesticide companies could be bolstered considerably if they themselves exercise restraint in endorsing their products. Furthermore, in cases of regulatory actions which are contested, a voluntary withdrawal from the market until the issues are resolved would help a lot.

b. Withholding/Tampering of Data — In the late 1970s, a company which conduct several toxicological tests for the pesticide companies was found to be tampering data and withholding adverse findings. Several compounds were compromised, causing the US-EPA to virtually overhaul the whole system of accepting data from third parties.

c. Pricing Policies — These policies are also open to question. Let us take the Masagana-99 Program for rice as an example. Many of us know that prices are regulated with the ceiling being set by FPA after exhaustive cost analysis. However, we know also that the local companies buy the pesticide from foreign companies; for Transnational Companies, the local subsidiary "buys" from the mother company. By building in profits into the intra-company purchase, the cost analysis is being effectively defeated. Just how much are these profits, we do not know. Some of us do not mind this, but others do and again they make sure that this is used to portray pesticides in a negative light.

3. Registration

As already mentioned and shown in Table 1, a regulatory agency like the FPA is concerned with evaluating toxicological data. How is this done? The present protocol calls for submission by pesticide companies of toxicological data and evaluation by the FPA expert. If the data is adequate, and there are no reservations on safety, the product is passed.

On the surface, the system is fine and does seem to assure safety. But let me raise some questions.

a. Should the data summaries be adequate in themselves? For example, if the claim is, "no damage to kidneys", how do we know that there are really no damage? In other countries, slides of the affected tissues have to be examined. Why not here as well? Are we capable of interpreting the slides in the first place? If we are capable, why don't we do it? Or is tacit accep-

tance an indication that we do not have this capability?

b. Some compounds have not been granted full registration until now but instead they have remained provisionally registered. How long are they allowed to remain in this situation? Is FPA placed in a situation where, because of externalities rather than internalities, it has no choice but to compromise? Can we be convinced that safety is not compromised?

Here, the issue of compliance may be raised also. It appears to me that pesticide companies are not so keen on regulations in developing countries, more so if this entails submission of data they consider confidential as are toxicological data. There also seems to be a general distrust on the capabilities of technical experts in developing countries. Therefore, the suspicion that there is an orchestrated effort to subvert the FPA's registration process may not be too far-fetched. What makes the whole exercise frustrating is the adoption by FPA of registration requirements proposed by no less than the international association of pesticide manufacturers (GIFAP or the in the 1977 FAO/WHO *Ad-hoc* Consultation on the International Standardization of Pesticide Registration Requirements).

Of course, we are not overlooking the question of confidentiality of the data submitted. After all, toxicological data are quite expensive to generate so that every effort must be made to safeguard it. What is considered wrong is the apparent lack of sincerity that characterized the relationship; it also smacks of colonial mentality.

4. Regulatory Activities

Developed countries have already institutionalized public involvement in the decision-making process. In the United States for example, the Environmental Protection Agency is required to publish in the Federal Register specifics about an on-coming decision with provisions for public participation before the decision is made. Public hearing may be required. Comments from the academic community is particularly solicited.

Here in the Philippines, however, this system of public involvement is non-existent notwithstanding the lifting of martial law. In general, decisions are made with little, if at all, regard for public reactions. Of course, the policy makers have to be assumed to be populists in inclination but nevertheless, there are aspects of regulation where the public should be heard. A good example here is the issue of provisional registration raised earlier. Then too, there is the continued presence of "banned" chemicals. The setting of toxicological cut-offs, is also another possibility.

One of the problems in this regard could be the defensive attitude that only those engaged in pesticide regulation should speak out on pesticides or only those of persuasions and attitudes acceptable to current administrators are to be heard. This we consider unhealthy because by placing pesticides and pesticide regulations in the marketplace of ideas, our regulatory approaches could be strengthened considerably. This public participation also strengthens the decision-making base especially if diverging reactions are made known.

5. Educational Aspects

It was earlier mentioned that safety in pesticide use is dependent on the knowhow of the user. Therefore, educational programs should be directed to this sector. Furthermore, the public wants to be informed so that this activity should not be overlooked. In the Philippines, and several other ASEAN countries, the pesticide dealers have been included in the programs.

In order to reach the farmer despite its limited capabilities, our FPA has adopted a filtering down approach through technicians of other agencies in the Ministry of Agriculture. This approach promises to be very effective *if* the major constraints, which is the inadequacy of the trickling down, can be solved. Since these technicians have primary loyalties to the other agencies, FPA has to make do with whatever effort can be allocated to it. On the other hand, all indications point to some progress although such may not be adequate to impatient sectors (which includes the author).

Some concern has been expressed regarding the gross underdosing by some farmers. Is this a bad practice really? Or is it something which should be encouraged in the first place? Those who are against the practice argue that this leads to inadequate control which may result in a pesticide being branded as "ineffectual". They contend that recommendations reflected in the label should be followed; after all, these are results of extensive and expensive tests. On the other hand, some toxicologists and pest management experts believe that this underdosing results in less damage to beneficial organisms and is thus more compatible with the current appreciation that reliance on a single control method, e.g. pesticide use, is disadvantageous.

In view of the above, what could be the position of compromise? Here, education will have to play an important part. Our farmers should be schooled on spot pesticide application as well as surveillance and forecasting. In this way, the underdosing which results from economic realities can be turned to advantage.

CONCLUSION

Some aspects, issues and problems regarding pesticides have been commented on. It is hoped that this not-so-exhaustive treatment will cause us to raise more questions for it is only by our knowing more that we can have safety in pesticide use.