**Historical perspective on chemical**

**pest control:**

Humans have always needed to control pests affecting them directly,

such as mosquitoes or bed bugs, or competing with them for a great

diversity of resources. Through the ages pest control practices have

changed dramatically. The earliest known record for the use of naturally

occurring compounds for pest control was in ≈1000 BC, when

the Greek Homer mentioned using sulfur as a fumigant. In the 1800s,

tobacco extracts and nicotine smoke were applied for insect control.

In 1867, we see the first mention of a mixture concocted for pest

control that became widely used; Paris green, an arsenic-based compound,

was developed and applied against Colorado potato beetle in

the USA. Bordeaux mix, a combination of copper sulphate and hydrated

lime, was developed in 1882 in Bordeaux, France, for control of

plant pathogenic fungi on grapes and other fruits.

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Synthetic chemical pesticides aren’t always the answer

There are some situations in which chemical pesticides are not the

most appropriate choice for controlling pests. One example would be

introduced exotic organisms that become pests; it has been estimated

that 30,000 exotic organisms have been introduced to the USA. In fact,

invasive species are now considered a major problem worldwide due

to the increasing human population frequently moving organisms

around the globe and thereby altering ecosystems at an increasing

rate. Many invaders become pestiferous largely due to the fact that

they are no longer associated with the natural enemies with which

they coevolved. Among pests in agriculture, approximately 20--40%

have been introduced from elsewhere. Most are accidental introductions,

although a small percentage of these were purposeful introductions

such as crop plants and honeybees. Some were purposeful

introductions with unexpected side effects.

so they establish and become ubiquitous before it

is possible to eradicate them. It is difficult to imagine how a synthetic

chemical pesticide can easily solve such a problem as a fastgrowing

weed, without continual human intervention and its associated

costs. Problems due to such pests are therefore often not

readily addressed using synthetic chemical pesticides because more

permanent control is what is needed. Classical biological control has

frequently been successfully used against such pests (permanently

introducing natural enemies from the land of origin of the pest).

Unfortunately, by all predictions, accidental introductions of invasive

species will only continue with the increased global movement of

humans and materials.

The goal of biological control is to control pests. The status of a species

as a pest at one time does not mean the species will always pose

problems. The subjectivity of designation as a pest is illustrated by

the fact that species that are pests to some people can be considered

beneficial by others.

So we conclude that biological control is more useful than chemical control.

**Table (1) comparision between chemical and biological control:**

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| **Biological control** | **Chemical control** |  |
| 1:10 | 1:2000,000 | Success ratio |
| 2 million US$ | 150 million US$ | Developmental costs |
| 10 years | 10 years | Developmental time |
| 20:1 | 2:1 | Benefita/cost ratio |
| small | large | Risk of resistance |
| Very large | Very small | Specificity |
| Nil/few | many | Harmful side effects |

**Advantages of Biological control for farmers and consumers:**

1**-**Strongly reduced exposure of grower and spray personnel to toxic pesticides.

2-Lack of residues on the marketed product.

3-Lack of phytotoxic effects on(young) plants, and no premature abortion of flowers and fruits. As aresult ,often yield increases are obtaind when Biological controlis applied .

4-Release of natural enemies takes less time and is much more pleasant than applying chemicals in humid and warm greenhouses.

5- Release of natural enemies usually occurs shortly after the planting period when the grower has sufficient time to check for successfully development of natural enemies.

6-Chemical control of some important agricultural pests is difficult or impossible because of pesticide resistance.

7- Biological control is permanent :once a good natural enemy-always agood natural enemy.

8-Low risk of food, water and environmental pollution.