MEETING

ABSTRACTS OF PAPERS PRESENTED AT

THE 12TH CONFERENCE OF THE WEED SCIENCE SOCIETY OF ISRAEL

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CHAIRMAN'S INTRODUCTORY REMARKS

WEED PROBLEMS REQUIRING OUR ATTENTION

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The symbol appearing for previous Weed Science Society of Israel (WSSI) meetings consisted of a weed and a chemical molecule, symbolizing successes. This year we have chosen the 'Innocent Weed'. Despite our successes with chemical and other control methods, some problems have remained and new ones have appeared, due to the evolution and ecology of weeds. Additionally, economic, ecological and political problems further complicate our efforts to deal with weeds, and these often have conflicting or mutually exclusive solutions. Among the problems facing the weed scientist are the following:

- Water — An excellent way to save expensive irrigation water is to prevent weeds from obtaining a share of it at the expense of crops. Chemical weed control methods are highly efficient in killing weeds and lead to less soil water loss than mechanical methods.
- Water — There is the worry that herbicides will contaminate ground and surface waters as well as food, especially with increased usage of herbicides. No above-limit herbicide residues have yet been found in water or food in Israel, but the chances are increasing.
- Appearance of more uncontrolled weeds — where mechanical and/or chemical control is inadequate.
  - Special problems exist with perennials, especially purple nutsedge (*Cyperus rotundus*). Broomrape (*Orobanche* spp.) and dodder (*Cuscuta* spp.) cannot be selectively controlled in crops. The problem is exacerbated by sunflowers replacing cotton, and the spread of the broomrape which attacks it. There is a possibility of broomrape control by genetic engineering. — More herbicide-resistant weeds are appearing, especially in wheat fields and orchards, despite our need to save water in these crops, and along roadsides. The number of such cases of resistance is quite out of proportion to the country's size. — The use of monoculture cropping and/or lack of herbicide rotation augments the problems of uncontrolled weeds.

- The rate of introduction of new herbicide chemistries with new modes of action and selectivity is far slower than the removal of older compounds from use.
- Our problems are but a reflection of those occurring elsewhere. We, too, often have a tendency to say 'it won't happen here', until it does.

Even though much more than half of the farmers' expenses for plant protection are for weed control (cultivation and herbicides), weed science is a 'step child' in academia, in applied research and in extension work. It is hard to know how we can progress and satisfy the needs, with so few people to do the work and with restricted means, despite the good intentions of the weed scientists. The percentage of the amounts invested in plant protection research which go to weed science is much smaller than the proportion spent on weed control by the farmer.

A: ALTERNATIVES TO CONVENTIONAL CHEMICAL CONTROL

PHYTOTOXIC MICROORGANISMS: ECOLOGICAL AND APPLICATIVE ASPECTS

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Retardation of annuals was observed in natural plant communities in some specific sites of the Negev Highlands, in the vicinity of shrubs of *Artemisia herba-alba* or on soft sandstone hills along the Mediterranean coast. Reduced yields in agricultural ecosystems, which are not the result of plant disease, are known in Israel as well as in other parts of the world, particularly in areas where replanting of deciduous orchards of the Rosaceae family, or roses in greenhouses, was taking place. The accumulated data support the view that phytotoxic microorganisms, among other factors, are an important factor which retards growth.

During the last 3 years we have isolated bacteria and actinomycetes from these sites and developed quantitative methods to evaluate their phytotoxic intensity. All the measurements indicated that the phytotoxic intensity of bacteria and actinomycetes from areas where inhibition occurred were similar to those from control sites. Nevertheless, compared with control sites, the density of the total microflora as well as of the phytotoxic isolates was significantly higher at sites where inhibition was found. When axenic seedlings of lettuce (*Lactuca sativa*) were inoculated with phytotoxic bacteria, it was shown that inoculum density had a crucial adverse effect on growth. We are presently examining a working hypothesis that phytotoxic microorganisms can be used to retard the growth of weeds. Crops will be protected against phytotoxic microorganisms, with inert, highly competitive microorganisms.

BIOLOGICAL CONTROL OF NUTSEDGE WITH SPECIFIC FUNGAL DISEASES

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The rust disease caused by *Puccinia romagnoliana* Maire & Sacc. and found on purple nutsedge (*Cyperus rotundus*) leaves, stems and inflorescences in the field, from the end of July