TRIP REPORT

July 30 - August 16, 1980

A.E. Deutsch

I. FAO (Rome)

II. International Association on Mechanization of Field Experiments (IAMFE, Wageningen/Netherlands)

III. WRO, other (U.K.) Weed Research Organization

I. FAO

People contacted:
- -L.J. Matthews, FAO Weed Specialist
- -L. Brader, Chief, FAO Plant Protection Service
- -G. Leon, FAO Integrated Pest Management Specialist
- -K.T. Zammarano, Editor, FAO Plant Protection Bulletin

Background - The Plant Protection Service of FAO, within the Plant Production and Protection Division, has functioned for over 25 years. It now has a headquarters (Rome) staff of 16 professionals, split into several groups, plus seven regional staff members. An agricultural officer slot defined as Pest Management/Weed Control was created 4 years ago and has been filled for the last 3 years by L.J. Matthews.

The Service utilizes the terminology "pest management," and "integrated pest control" extensively. Emphasis has been given to desert locust control and remote sensing as well. An FAO Committee of Experts on Pest Control met for the first time in March 1980 (in Rome). The report of the meeting essentially dealt with insect control only, and then primarily the desert locust.

Weed Control - Matthews expressed appreciation on several instances for the AID/OSU weed project's support in obtaining a collection of weed science-related literature. He solicited further assistance from the project in the form of visuals (both slides and printed reproducable form) for use in an internal presentation he intends to give for FAO program development personnel. Tentative working title is: "The Place and Role of Weed Control in Developing Agriculture."

He also seeks more information and current awareness (state of the arts) for no-till farming, and welcomed the suggestion that IPPC contact the No-Till Farmer to arrange a subscription for him.

On the matter of weed science short courses, which Matthews believes are urgently needed to improve capabilities of developing countries' nationals, FAO maintains a policy whereby such events may not be "promoted," but must be requested by the country/region/institution before FAO can respond. Funds, however, do seem to be available (through UNCP) to support training. The course held in Argentina (Oct.-Nov. 1979) is a case in point. A course supported by FAO and held at CIAT (Centro Internacional de Agricultura Tropical, Cali, Colombia) is under consideration, but has run into snags.

Integrated pest management - Dr. Leon has just completed her first year as the coordinator for this effort. She cited several cases of interaction between weed pest and insect pest; studies conducted in Nicaragua revealed that Bemisia tabaci (white fly) started population buildup in weed plants adjacent to cotton fields so that timing control of these weeds became important to avoid insect migration to crop plants.

She has responsibility for maintaining information flow in IPM, coordination between member countries activities, and serving as the resident advisor.

Plant Protection Bulletin - Editor K.T. Zammarano noted that issues of the publication tend to be "late" due to problems and antiquated print production methods. She felt that possibilities of changing were relatively slight at this time. Photos are included occasionally, though there is no specific effort directed toward inclusion of visuals.

Zammarano did not express encouragement toward the AID/OSU-IPPC effort submitting an article. To have any chance for inclusion, the item would have to include some connection to FAO. It was not clear as to where final editorial approval lay--with the service Chief, the editor, or some other combination.

II. International Association on Mechanization of Field Experiments

People contacted: -Various conference attendees
-Various equipment manufacturers

Exhibit - An integral part of the conference involved an exhibit of field plot equipment. WRO (Weed Research Organization), in addition to displaying several Oxford precision sprayers (handheld), also had a 2-man transportable, double spinning disc setup as well as a working model of the Mardrive Linear Transporter which uses a combination of compressed air and magnetic drive.

The Center for Agrobiological Research (CABO) at Wageningen displayed two rope wick units, both mounted on motorbike wheels for hand pushing. One had the conventional layout of overlapping ropes grommeted into a large diameter PVC pipe. The other had some interesting features with one large diam. PVC tank gravity feeding two smaller diam. manifolds between which were stretched 21 ropes of about 12 in. length (ea.), nearly parallel to the direction of travel.

There was also a new Canadian 2-bicycle wheel compressed air sprayer that at a cost only two-thirds the MAT sprayer, appeared worth investigating (information being requested).

Most of the attendees at the conference either had not seen a "wiper" style applicator or were totally unfamiliar with the concept.

There were no revelations nor any other applicable information (to the AID/OSU project) presented.

Equipment manufacturers - One day was devoted to visiting four pesticide application equipment manufacturers within a 50 km radius of Wageningen. Information was collected to update the IPPC Pesticide Application Equipment file. Several firms listed in the file have either merged or ceased operation. Equipment viewed ranged in size from a 10 liter backpack handpumped unit to a Unimog-mounted behemoth with full hydraulics and a swath of some 60 ft.

IITA Weeding Systems

International Institute of Tropical Agriculture ag engineer Ray Wijewardene, who attended the conference, conducts a weeding systems program in Sri Lanka. He has "arranged my own financing channeled through IITA/Ibadan," but seeks closer ties with the AID/OSU Program. He had contacted IPPC for collaboration in the past when IBM was funding work at IITA (coordinated by Volunteers for International Technical Assistance).

Wijewardene's group (3 people) has focused on weed control using no-till, mulch, and herbicides. He showed slides of several systems with results that appeared impressive. In one case, ipil-ipil (Leucaena spp.) was planted in rows. At a certain height it was cut to within .5 m of ground level (providing a much-needed firewood supply) and a crop planted in rows in between. The woody plant had both fixed N in the soil and provided some leaf mulch.

The Sri Lankan program uses various versions of the rolling jab planter (said to be improved over the Banbury model) as well as spinning disc applicators. The systems explained to me all depended on herbicides in one phase or another.

Wijewardene seeks closer contact with U.S. herbicide firms. He has already established ties with research personnel in Bayer and Ciba-Geigy. He specifically asked about Monsanto.

Attendees - Most of the major international ag research centers were represented: IITA, CIMMYT, ICRISAT, and ICARDA (CIAT and IRRI were not). Hence there was an opportunity to interact (to a limited degree) with several individuals on the staffs of these Centers. While appreciative of the need for weed control, few seemed keenly interested nor very current on the state of the art.

III. U.K.

People contacted:
-E.J. Bals, Micron
-J. Fryer, WRO
-S. Mercer, COPR
-D.J. Girling, CIBC
-T.M. Keogh, Cooper, Pegler
-E. Thornhill, OSMC

Micron Sprayers Ltd. - Aside from continuing to produce and refine both handheld as well as vehicle mounted "rotary atomizers," Micron is experimenting with an electrostatic unit. It is hand held and uses C-cells to create an extremely high voltage charge. Spray liquid gravity feeds (from a small plastic container) and is broken into droplets and charged simultaneously. There are no moving parts. Micron regards the system as unproved, but of interesting potential at this time.

Massive numbers of insecticide applicators (Ulva) are being shipped in knockdown, component form to Tanzania for assembly there. Micron personnel estimated a flow of approx. 20,000/yr to this one country, primarily for pest control in cotton.

Mr. Bals is a dynamic individual, but is of an age where he will have to play a less active role in company affairs leading to some speculation as to the future of the company. While he is a firm advocate of using pesticides when appropriate, he also believes that much lower concentrations can be utilized with better targeting of the material. Chemical companies will, "have to learn to sell hectares of plant protection instead of gallons of poison," he observed.

The firm has developed the Micromax, the applicator for mechanized equipment. It can be used for tje high speed application technique gaining favor in the U.K. It utilizes belt drive from the motor to the disc with speeds of 5,000 and 2,500 RPM available. Thus it can be used for insecticides (higher speed and smaller droplets) or herbicides. Another development is the Turbomax, a unit in which water at 80 psi powers the disc and continues on to be metered and mixed with the compound to achieve the desired concentration. The Turbomax has not been placed on the market yet.

Weed Research Organization - The matter of weed "management" vs. "control" was a current topic at WRO. John Fryer, WRO director, has been asked to present a paper to the prestigious Royal Society next fall on "weed management." He felt uncomfortable with the approach and was in the process of corresponding with others regarding terminology.

He discussed the aspect of species (weed) shifts in the U.K. which current cultural practices engender. But there's not much chance of getting the farmer to severely alter cropping sequences to implement weed control.

The tropical weed group continues. Current activities involve, among others, a plant breeding effort to produce striga-resistant strains of sorghum and millet. Some of the testing is underway at WRO in cooperation with a plant breeder at ICRISAT.

A formerly rather passive weed, Bromus sterilis (star brome), has recently emerged as a serious problem. Again, cropping culture shifts have led to this species' change of character. It spreads under conditions of minimum tillage.

Jimmy Elliott, weed control group leader, discussed the concept of rapid travel over wet lands and then showed several people the WRO Argocat ATV. It's far from the complete answer, he said, and what is needed will be a vehicle that is more of a compromise, has greater ground clearance, and can be used for more than one operation. He mentioned that the Willmot Lightfoot machine, recently developed in the U.K., is being well received.

M.E. Thornton showed the writer three "wipers," a commercial roll-type that emits a gel onto a sponge like roller that offsets the material onto a hydraulically turned steel roller, a hand held tube-like dabber, and a research sponge roller fed by a dribble bar. The latter incorporates a dye so that treated areas are visible. Note: use of dye seems to be a worthwhile concept for further investigation.

Long term measurements of weed population dynamics will play an increasingly important role according to G. Cussans of the weed control section. He discussed the possibilities of using weed thresholds--certain levels of weeds per square area--as a possibility for when to spray, or even whether to spray or not.

Tropical Pest Management - The quarterly, formerly entitled PANS, is part of the Center for Overseas Pest Research which evolved in 1970 from the British-supported Anti-Locust group. Hence, TPM's background tends to be in entomology.

Steve Mercer, Valerie Howe, and Dr. B. Steele serve as editors for weeds, plant diseases, and entomology. They solicit (ms.) for the three topics and emphasized their particular interest in items of a practical nature. All feature items are refereed. The editors search out and write their own news notes.

TPM is not self supporting. Press runs usually are just over 3,000 with 600-700 paid subscriptions (now US $45/yr via surface). The publication has started carrying commercial advertising to help offset costs. Each editor utilizes contacts for technical advice. Abstracts in French and Spanish are produced by contract with "outside" sources, and may be discontinued as an economy move.

Mercer indicated that, of the three disciplines, weeds seem to be written about least. He occasionally has difficulty securing sufficient material to obtain a subject matter balance reputedly sought by the periodical. They are receptive to material from IPPC.

Commonwealth Institute for Biological Control - The Institute is one of several in the Commonwealth Agricultural Bureaux financed through the British Overseas Development Administration. CAB picks up approximately half the cost of CIBC operations with the remainder generated by projects financed by commonwealth members.

CIBC headquarters are in Trinidad; field stations are located in Rawalpindi, Pakistan; Delemont, Switzerland; Bangalore, India; and Nairobi, Kenya (under negotiation). Only a 1-person "information services" resides in London; the assistant director is officed nearby at Slough, England.

For all intents and purposes CIBC is mainly entomological. They have not done any work on allelopathy and apparently have no plans in that direction. Some research has been carried out on weed control by insect predators. A project financed by Australia supports a scientist searching for natural enemies of Parthenium hysterophorus in Mexico, reputedly the original source region for the weed. One predator insect specie has been identified and is under intensive testing.

CIBC plans to establish a natural enemies data bank, for insects. The Institute uses various computerized data bases for reference searches, all conducted on a cost-to-requestor basis. They demonstrated a direct phone connection and portable print out system that was quite impressive.

Cooper, Pegler Co. - Among the major producers of knapsack sprayers worldwide, this firm traces its roots back to the 19th century. Now it is part of the Dyno Group (related to Nobel), of Norway. In fact, the parent firm produces all the cast plastic bits for C,P.

C,P. has developed a hand sprayer testing facility and wants to market same (detailed literature is being sent directly). The equipment performs torture tests on sprayers to determine whether they meet specifications of groups such as the World Health Organization. Cost for the setup would be circa $20,000.

Products of the firm are marketed worldwide with emphasis on Africa. Company personnel explained that units are designed for use under severe conditions and thus worth their premium price. Experience appears to support their contention.

The firm is in the final stages of testing a unit with an advanced design and significant improvements over certain machines in the present product line. Too, they are weighing potentials of ULV and electrostatic application methods.

Overseas Spraying Machinery Center - Continued contracts with the World Health Organization, as well as ODA, and the British Crop Protection Council support the OSMC which is in its 25th year of operation. Dr. G.A. Matthews heads a staff of seven.

The Center has some extremely sophisticated testing equipment including a laser beam spray analyzer and a high magnification, computer driven spray pattern monitor. The "standard" machine testing units are very straight forward, but effective in revealing design or production deficiencies. There is also a materials testing area to assess hose (for instance) resistance to chemical antagonism.

While actual equipment design has not been emphasized, a special project attached to OSMC involves an extremely interesting concept. A prototype machine has been built, and tested in Botswana, using two peristaltic pumps to supply a "battleship" spinning disc applicator. Both the pumps and disc are driven from a land wheel. The rig is hand pushed. The disc spins inside a shroud that is adjustable for swath width. Thus, the advantages of rotary atomization are realized--uniform small droplets, low water volume required--without the need for batteries. It also conserves spray solution and maintains a steady aboveground height and, therefore, swath width.

The Center has conducted tests of ICI's electrostatic sprayer. The latter will reputedly become available for purchase in September. One advantage over the spinning disc concept is that the six batteries required last many hours longer in the electro-static unit.

While at OSMC I had the opportunity to view a rolling jab planter (based on the Banbury-IITA design) modified for "traditional" rather than minimum cultivation. Eighty units have been sold in Africa. The unit can also be used to apply fertilizer (if not caked), but not simultaneously.

Conclusions

1. The AID-OSU/IPPC program appears to be as knowledgeable and active in the realm of handheld wiper/wick applicators as any other entity. In fact, it would seem that further work could be carried out and published without too much overlap with others.

2. Tropical Pest Management is highly receptive to meaty, pracically oriented feature articles.

3. The AID-OSU/IPPC effort needs to remain in close touch with WRO, OSMC, and manufacturers of smaller equipment.

4. Serious thought needs to be given to establishment (in the U.S.) of a publically supported facility for impartially testing and evaluating small equipment for pesticide application equipment.

5. The OSU project still represents one of the world's most comprehensive centers of knowledge regarding weed control under LDC conditions. IPPC's role as an information clearing house and repository was re-emphasized as a result of this trip. Too, the project can continue to play a critically important role through support and interaction with FAO, the IARCs and other key organizations worldwide.