# IR-4 Commodity Liaison Committee (CLC) News

The Commodity Liaison Committee met at the Plaza Hotel in Washington, DC on October 5th prior to the IR-4 Symposium on Future Approaches to Minor Crop Pest Management. Since it is a goal and objective of the CLC to increase the IR-4 budget, the meeting focused on budget increase strategy implementation. Several invited guests also addressed the Committee during the meeting. The guests included: Leonard Gianessi of the National Center for Food and Agricultural Policy, Bob Hollingworth (Chair, IR-4 Project Management Committee), Bob Holm (Executive Director, IR-4 Program), Hoyt Jamerson (Minor Use Officer, EPA), and Sandy Perry (National Outreach Specialist, IR-4). Following the meeting, committee members attended the IR-4 Symposium. At the request of Washington State CLC members, Congressman George R. Nethercutt, Jr. (R-WA) gave the opening address. Congressman Nethercutt serves on the prestigious House Committee on Agricultural Appropriations. After the Symposium, Ann George (Hop Industry), Rocky Lundy (Mint Industry) and Ray Ratto (CA grower) met with Richard Rominger (Deputy Secretary of USDA) and staff to discuss the IR-4 program and budget. These and other CLC members also visited their respective congressional delegates on Capitol Hill. The IR-4 Project has been an important and irreplaceable mechanism for registering pest control compounds in all minor crops for several decades. As FQPA restricts or eliminates the use of certain pesticides, the IR-4 Project becomes increasingly crucial to maintaining the quality and quantity of food production in the United States. The IR-4 budget process can be impacted with a timely, concerted and coordinated effort. The CLC appeals to everyone reading this newsletter to join in this effort.

Article by Rocky Lundy, Chair

# IR-4 Methyl Bromide Alternative (MBA) Programs Presented at MBA Conference in San Diego, California

The 1999 Annual International Research Conference on Methyl Bromide Alternatives and Emission Reduction was held in San Diego, California on November 1-4, 1999. This Conference is truly international in scope with approximately 350 registered participants from countries around the world.

The status of IR-4's MBA program on strawberries and tomatoes was reviewed at the MBA Conference. Treatments, test locations, and future plans were reviewed for the tomato program which is scheduled to begin in California and Florida in February/March 2000.

Details of IR-4's ongoing strawberry program were also reviewed at the Conference, and since these trials were initiated in September 1999, preliminary data from one of the four strawberry test sites were available for review at the Conference. The data were presented with an explanation that they were preliminary, from a single site, and represented only a small part of the total data to be collected from all test sites. However, even though the data were preliminary and somewhat limited in scope, the differences seen between certain treatments were so interesting that we believed the data warranted discussion at the Conference.

Strawberry Program Oxnard, California Trial

The number of treatments used in the Oxnard, California strawberry trial differed from the three other test sites in that it had a total of twelve treatments compared to eleven treatments at the Salinas, California strawberry test site and ten treatments at both of the test sites in Dover, Florida. Treatments at the Oxnard site differed from the Salinas site in that DiTera ES + chloropicrin + metam sodium was included in Oxnard but not in Salinas and it differed from the two sites in Florida in that it included a methyl iodide treatment without chloropicrin. The methyl iodide treatment without chloropicrin and the DiTera combination treatment are not being evaluated in Florida.

*Details of the treatments in the Oxnard trial are as follows:*

Methyl Iodide Treatments

The methyl iodide treatments included two rates of methyl iodide (referred to as X and 1/2 X rates) in combination with chloropicrin and a single rate (1/2 X) of methyl iodide without chloropicrin. The X rate for methyl iodide is equiva-

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lent to the standard methyl bromide + chloropicrin (67/33) rate of 350 pounds product per acre or 235 pounds methyl iodide plus 115 pounds chloropicrin per acre. The 1/2 X rate of methyl iodide from a 50/50 combination with chloropicrin was 117.5 pounds methyl iodide plus 117.5 pounds chloropicrin per acre. The 1/2 X rate of methyl iodide without chloropicrin was 117.5 pounds methyl iodide alone.

All methyl iodide treatments were bed-fume applied and shanked into a depth of approximately 8 inches from two shanks per bed spaced 8 inches apart. The beds were mulched with plastic film during the fumigation process.

Methyl Bromide Standard Treatments

Methyl bromide plus chloropicrin (67/33) was bed-fume applied at 350 pounds product per acre following the same procedure described above for methyl iodide.

Metam Sodium (42%) Alone Treatments

Metam Sodium was applied by drip irrigation in enough water to achieve wetting down to about 18 inches. Three tapes were placed on the tops of the beds and they were covered with plastic mulch prior to applying the metam sodium. This treatment was made 21 days before transplanting.

Enzone Treatments

Enzone was used at two rates (X and 2X) in combination with chloropicrin and metam sodium. In this combination treatment, metam sodium was applied for weed control by applying it to the bed tops at a rate of 37.5 gallons (42% ai) per acre 7 days before applying chloropicrin by drip irrigation. The metam sodium was covered with plastic mulch immediately after application and at the same time as installing drip tapes for the chloropicrin and Enzone treatments. Chloropicrin EC was applied by drip at 200 pounds per acre 7 days after the metam sodium treatment and 7 days before the pretransplant applications of Enzone. Enzone was then applied at X (3000 ppm) and 2X (6000 ppm) rates by drip irrigation 7 days after the chloropicrin treatment and approximately 14 days before transplanting. Three post-harvest applications at 30-45 day intervals at 1000 ppm were scheduled in this trial but had not been made when the first data were collected from the test.

Inline (Telone C-35 EC) Treatments

Inline or Telone C-35 EC was used in combination with metam sodium in this trial. The metam sodium was applied for weed control as described for the Enzone treatments. The Inline was then applied by drip irrigation at 32 gallons per acre in approximately 1 1/2 inches of water per acre at 21 days before transplanting.

DiTera Biological Nematicide Treatments

DiTera ES was applied in combination with metam sodium and chloropicrin. The metam sodium was applied for weed control as described for Enzone and Inline. Chloropicrin was used as described in the Enzone treatments. DiTera was applied via drip irrigation at 8 gallons of product per acre at 7 days after the chloropicrin treatment and 14 days before transplanting. A post-transplant application via drip irrigation at 5 gallons product per acre was also scheduled in this trial but had not been made at the time of collecting the first data from this trial.

Basamid (Dazomet) Treatments

Basamid (Dazomet) was used in combination with Inline in the Oxnard trial. Basamid was applied to the bed tops with a granular applicator at a rate of 200 pounds product per acre. The beds were sprinkled by sprayer at 1000 gallons of water per acre on the date of application. An additional 1/4 inch of water was applied on the morning and afternoon on the day following applications. Drip tapes were installed on the beds and covered with plastic mulch. The timing for the Basamid application was at an estimated 3 day period before transplanting. Inline was applied at 32 gallons per acre by drip irrigation in 1 1/2 inches of water per acre at 21 days before the date of transplanting.

Experimental Design/Evaluation

All treatments were replicated four times in a randomized complete block design. Plot sizes were single beds 100 feet long. One day before application, packets containing 50 cc soil inoculated with citrus nematode (*Tylenchulus semipenetrans*), *Verticillium dahliae* and *Rhizoctonia solani* were buried in each plot at 6 inch intervals down to 36 inches below the bed tops. Five days following application, the packets were retrieved and assayed for citrus nematode and *Rhizoctonia solani*. *Verticillium dahliae* assays require a longer interval and have not yet been completed.

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Preliminary Results Oxnard Trial (Got Data)

Data from 6 inch depths are showing statistical differences between treatments from the Oxnard, California strawberry trial. Data were also obtained at the 30 and 36 inch depths but no differences existed between treatments, including the non-treated check. For a copy of the data, please contact Dr. Jack Norton <jnorton@hunterdon.csnet.net>.

All methyl iodide treatments provided control of citrus nematode and *Rhizoctonia* equivalent to the standard methyl bromide treatment. The 1/2 X treatment rate, with or without chloropicrin, was equal to the full rate of methyl bromide against these organisms in this trial, greatly enhancing the potential economic feasibility of developing this product.

The chloropicrin EC drip applied treatment may have been evaluated at a rate too low for optimum performance under the conditions of this test. It was particularly weak against *Rhizoctonia* which came as a surprise since we expected to see better efficacy against this pathogen with chloropicrin.

Inline gave excellent control of citrus nematode down to 24 inches but was weak against *Rhizoctonia* even at the 6 inch depth in our trial.

Metam sodium performed very well against citrus nematode and *Rhizoctonia* providing control statistically equal to all methyl iodide treatments and the methyl bromide treatment.

The Enzone treatments and the DiTera treatment were weak against citrus nematodes and *Rhizoctonia* in this trial but with both products, the post-transplant treatments had not been made and it is likely that performance would have been much better if ratings had been made later.

It should be repeated that with all of the above treatments the data available to date are preliminary and limited in scope. Data being collected now and to be collected later will measure the weed control effectiveness of each of the treatments. Data will also be collected on growth and vigor of the plants, on fruit quality and/or yield. When data are available from all trials and all performance criteria are considered more supportive, conclusions on the efficacy of individual treatments will be possible.

Article by Jack Norton

# New Herbicides: Brighton Conference

On 15-18 November 1999, I attended the Brighton Conference, a major annual international meeting on crop pests and their control sponsored by the British Crop Protection Council. One highlight of the meeting is that crop protection companies often use the venue to announce new pest control compounds. The emphasis of the meeting each year alternates between weeds, and insects and diseases. The 1999 meeting emphasized weeds.

At the beginning of the conference, it was announced that there were approximately 1,100 delegates registered, which the organizers called "remarkable" considering the ongoing changes in the crop protection industry. Pre-conference literature indicated that attendance over the past years has averaged approximately 1,500 people.

Most of the compounds in the New Herbicides Session this year were for weed control in small grains, which reflects the change in emphasis on part of the agricultural chemical companies. It cannot be assumed that all these compounds will be registered in the U.S.; however, information on registration plans for specific countries or regions is included in the summary if discussed.

Iodosulfuron plus mefenpyr-diethyl (AgrEvo). Iodosulfuron-methyl-sodium (proposed common name) is a sulfonylurea herbicide for early to mid-postemergent control of grass and broadleaf weeds in winter, spring, and durum wheat; triticale; and rye. Use on barley remains under investigation. Like other sulfonylurea herbicides, Iodosulfuron inhibites ALS (acetolactase synthesis). Mefenpyr-diethyl enhances the

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metabolism/detoxification of iodosulfuron in cereals, but not in broadleaf and grass weeds. The new product will be formulated in a 1:3 ratio pre-mix, with a recommended application rate of 0.0089 lb ai/A iodosulfuron plus 0.027 lb ai/A mefenpyr-diethyl. Preliminary rotational data indicate no injury to canola, sunflower, and ryegrass at 105 days after application. There was no injury to sugarbeet at 11 months after application and no injury to corn at 12 months after application.

Flucarbazone-sodium (Bayer). Flucarbazone-sodium is a sulfonylaminocarbonlytriazolinone herbicide under development for wild oat and green foxtail control in wheat in the U.S. and Canada. It will be sold under the trademark Everest and formulated as a 70WG. It is an ALS inhibitor with both grass and broadleaf weed activity at the suggested use rate of 0.027 lb ai/A. The EPA granted it reduced risk status in June 1999. Registration in Canada is expected in 2000, and registration in the U.S. in 2000 or 2001.

BAY MKH 3586 (Bayer). BAY MKH 3586 (proposed common name, amicarbazone) is a triazolinone herbicide under development for use in corn and sugarcane. It inhibits photosynthesis, and cross-resistance has been observed in plants that are tolerant to triazines and other photosynthesis-inhibiting herbicides. It can be used in corn up to 0.45 lb ai/A applied to the soil, preplant or pre-emergence. It also has burndown activity. Soil and burndown activity is primarily on broadleaf weed species.

BAS 662 H (BASF). BAS 662 H is a pre-mix of diflufenzopyr (BAS 654 HG) plus dicamba in a 1:2.5 ratio for post-emergence broadleaf weed control in corn. Diflufenzopyr is herbicide synergist that enhances the activity of dicamba by enhancing the transport of dicamba to growing points. Post-emergence application rates range from 0.089 to 0.27 lb ae/A of total product (0.064 to 0.19 lb ae/A of dicamba). BAS 662 H was registered in the U.S. and Canada earlier this year (1999) in joint review.

UBH-820 (Ube Industries). UBH-820 (proposed common name, beflubutamid) is new compound under development by Ube Industries for post-emergence control of broadleaf weeds at rates of 0.15 to 0.23 lb ai/A in wheat, barley, rye, and triticale. It inhibits phytoene desaturase in the carotenoid biosynthetic pathway. It will be sold in Europe as a pre-mix with isoproturon.

AC 900001 (Cyanamid). AC 900001 (common name, picolinafen) is an aryloxypicolinamide herbicide being developed for post-emergence broadleaf weed control in wheat and barley. The application rate will be 0.045 lb ai/A. It inhibits phytoene desaturase in susceptible plant species. No rotational crop restrictions are expected as lettuce, soybean, carrot, pea, sugarbeet, and sunflower showed no injury 30 days after application. It will be sold as a pre-mix with pendimethalin, isoproturon, cyanazine, and 2,4-D, depending on country. The first registration in Europe is expected in 2001. Registrations in Australia and Canada are anticipated in 2001 and 2002, respectively

BAY MKH 6561 (Bayer). BAY MKH 6561 is in the sulfonylamino-carbonyltriazolinone herbicide family, and is being developed for post-emergence grass weed control in wheat, rye, and triticale. It inhibits ALS. Application rates will be 0.027 to 0.063 lb ai/A. Broadleaf weeds in the *Cruciferae* family are also controlled. It will be sold under the trademark Camaro, with registration expected in 1999 or 2000. In the U.S., BAY MKH 6561 will be sold under the trademark Olympus, primarily for control of *Bromus* sp. at 0.027 to 0.040 lb ai/A. Emphasis was made of activity against *Aegilops tauschii* (jointed goatgrass), a weed species closely related to wheat. A sequential application of 0.027 lb ai/A followed by 0.027 lb ai/A gave 60% control of *A. tauschii*.

BAS 620 H (Nippon Soda/BASF). BAS 620 H (proposed common name, tepraloxydim) was discovered as a joint venture between Nissan Soda and BASF. It provides post-emergence grass weed control in broadleaf crops at rates of 0.045 to 0.067 lb ai/A. Applied at 0.089 lb ai/A, it will control perennials such as johnsongrass, and suppress bermuda grass. It inhibits ACCase (acetyl-CoA carboxylase). Crop safety has been demonstrated in *Allium* species (includes onions and leeks) and *Pinus* species, but *Brassica* crops such as canola, mustard, and oil-seed rape can be sensitive, particularly with low temperatures. First registrations are anticipated in 1999/2000.

BAS 625 H (BASF). BAS 625 H is in the cyclohexenone family and is being developed for post- emergence grass weed control in rice. No proposed common name was presented. It is an ACCase inhibitor and use rates range from 0.045 to 0.18 lb ai/ha. It will be sold under the trademark of Tetris in Asia, and Aura in South America. Registration is anticipated in most rice growing countries.

Information was presented on the following compounds under development, although they had already been introduced previously.

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Floransulam (Dow). Floransulam is an ALS inhibitor that is a member of the triazolopyrmidine sulfonalilide family (along with metosulam, flumetsulam, cloransulam-methyl, and diclosulam). It provides post-emergence control of broadleaf weeds in cereals, particularly *Galium aparine* (catchweed bedstraw), at rates of 0.0045 to 0.0067 lb ai/A. Registrations are anticipated for cereals in Europe and Canada, and for turf in Japan.

BAS 615 H (BASF). BAS 615 H is in the isoindoldione family, and is based on cinidon-ethyl. It inhibits protoporphyrinogen IX oxidase. It is particularly active post-emergence on *Galium aparine*, among other broadleaf species, in small grains at 0.027 to 0.045 lb ai/A.

Mesotrione (Zeneca). Mesotrione (ZA 1296) is being developed for pre-emergence and post- emergence control of broadleaf and some grass weeds in maize. It is a member of the triketone family, and it inhibits p-hydroxyphenylpyruvate dioxygenase (HPPD), ultimately disrupting carotenoid biosynthesis. Application rates will range from 0.089 to 0.20 lb ai/A when applied pre-emergence, and 0.063 to 0.13 lb ai/A when applied post-emergence. It appears that mesotrione will be marketed as a stand alone product, as well as a premix with acetochlor for pre-emergence use, and a premix with nicosulfuron for post-emergence use. Current plans are to market the product in 2002.

Other major topics at the meeting included lengthy discussions on crops genetically modified to be resistant to pesticides, and attempts to harmonize pesticide registrations on a regional and global basis. These topics may be the basis of future Herbicide Updates in the newsletter.

Article by Fred Salzman

# Herbicide News/Meetings

**Herbicide Action Course Purdue University West Lafayette, Indiana 10/17-22/99**

IR-4 Headquarters was represented at the "Herbicide Action Course" held at Purdue University, West Lafayette, Indiana in October.

Herbicide Action was a very intensive, five-day course covering topics relating to a good understanding of the activity, selectivity, behavior, and fate of herbicides in plants and the environment. It should be of great value to those working with agricultural chemical companies in research, development, and technical service; to crop consultants, and to other individuals working on weed control in either the public or private sector. The course began on Sunday, October 17th and ended Friday October 22nd, 1999. It consisted of lectures, (illustrated with slides whenever possible), demonstrations, and discussions. The WSSA "Herbicide Handbook" and a book of lecture notes was provided to each participant. Fifty participants attended the course.

Course topics were: Herbicide Mode of action, characteristics, structure-activity relationships, uses, selectivity, bioassay methods, and metabolism for each of the following groups: Photosystem II inhibitors; Protox inhibitors and superoxide generators; Mode of action of glufosinate; Cell growth disrupters and inhibitors; Lipid biosynthesis inhibitors; pigment inhibitors; Inhibitors of amino acid biosynthesis; Inhibitors of cell wall biosynthesis; New herbicides; Weeds and their characteristics; Penetration of foliar applied herbicides; Herbicide adjuvants; Translocation of herbicides; Uptake of herbicides from the soil; Classification and selectivity of herbicides; Weed interference and weed ecology; Integrated weed management systems; Herbicide resistance in crops and weeds; Herbicide safeners; Herbicides and surface and ground water; Weed control in turf; Industrial vegetation management; Herbicides and reduced tillage; Diagnosis of herbicide injury; Immuno-assays; Behavior of herbicides in soil: Characteristics of soil colloids, Adsorption of herbicides, Microbial and nonmicrobial breakdown,herbicide mobility, and Herbicide biopersistance.

Overall impression: The Herbicide Action Course is a comprehensive scientific analysis of herbicide technology. The course brings with it a distinguished faculty and expertise that attracted more than 1,500 participants over the past 20 years. For more information please contact Dr. S. C. Weller, Course Director, phone: 765-494-1333, fax: 765-494- 0391, e-mail: weller@hort.purdue.edu .

Article by Marija Arsenovic