THE WEED SOCIETY / OF NEW SOUTH WALES

c/o Department of Agriculture, ~~Box 36, G.P.O.~~, Sydney

[redacted] No. 68/4 August, 1968.

NOTICE OF GENERAL MEETING

The next meeting of the Society will be held at the Department of Agriculture, Basement Conference Room, Farrer Place on Monday, 9th September at 7.30 p.m.

The speaker will be Mr. B. Long, Weeds Officer, Berrima County Council, on:-

"The Role of Councils, Weeds Officers and Landholders in Weed Control."

Bernie Long is well-known in the Council weed control field and is a founder member of the Society. His talk should prove of interest to all members and other persons interested in the broader aspects of weed control.

PERSONAL NEWS

Mr. P. Gregory - It has been reported by several members that Peter Gregory, past Secretary of the Society has been sighted in Sydney. A letter from Peter appears in the correspondence section of this Newsletter.

Mr. K.A. Watson of Amalgamated Chemicals Ltd. will be leaving on a visit to Canada, U.S.A., U.K. and Switzerland in mid-October. He expects to return to Australia in December.

FORTHCOMING EVENTS:

September-October	- Timber Control Field Day
October-November	- Weed Control in Summer Cereal Crops
November 7 and 8	- First Victorian Weeds Conference organised by the Weed Society of Victoria.

REPORTS OF MEETINGS:

Industrial Weed Control (see attachment)

General Meeting

Industrial Weed Control

Twenty eight members attended the general meeting of the Weed Society on June 24th. The subject discussed was Industrial Weed Control. Mr. J.M. Swain of the Agserv Division of Geigy Australia Pty. Ltd., and Mr. R.D. Locke of Du Pont Far East Inc., addressed the meeting.

Mr. Swain outlined typical areas of use of non-selective herbicides. He said that chemicals must compete with mechanical weed control methods, the latter being usually more economical initially. With the use of herbicides, the problem must first be defined, then the correct chemicals used and used correctly with regard to plant species and life cycle. Prior use of herbicides and the environment will influence the species present. The anticipated results must be known and the whole approach based on a programme. It is usually best to include a surfactant with the herbicide and use a concentration rate rather than a "per acre" rate.

Contact and translocated herbicides were compared. The former are fast-acting and will overcome "out-of-hand" situations of annuals but mostly give only short-term control. They fit into situations where it is desired to burn later. However, they cannot be classed as "broad-spectrum" chemicals.

Translocated herbicides are usually slow-acting but are better on perennial species than the contact herbicides. It is usually best to apply them to perennials at or after flowering. Follow-up burning encourages new growth.

Mr. Locke outlined the factors affecting the performance of residual herbicides - soil type, rainfall, type of weeds and rate and evenness of application.

He then discussed the types of equipment most suitable for application. Piston pumps are usually best, with a capacity of 25-50 gallons per minute for high volume spraying. Agitation is important, mechanical agitation with paddles being preferred. Strainers and filters should be 50 mesh or coarser when using wettable powders.

With all types of herbicides, a high volume (100 or more gallons per acre) is the most popular method of application and ensures an even coverage.

In the discussion which followed, it was suggested that height and density of weeds should be used as a criterion of amount of chemical applied, rather than a fixed volume per acre. If the equipment is first nominated, then a concentration rate of chemical can be recommended. At present this is done only with 2,4-D and 2,4,5-T. However, quoting of costs for an area then becomes difficult. Letters to the editor would be welcomed on the question.

Problems of perennial grasses, use of surfactants, chemical mowing and railway equipment were also discussed.

REPORT OF MEETING OF THE WEED SOCIETY OF NEW SOUTH WALES

This meeting was held at Agriculture House, Sydney, on Monday 22nd July at 7.30 p.m. The speaker was Mr. D.G. Sharpe of Plant Protection Ltd., Fernhurst, England, who spoke on :

"The Application of Bipyridyl Herbicides"

Background

David Sharpe is a mechanical engineer who has been used by I.C.I. to devise agricultural machinery to utilise agricultural chemicals.

He is now concerned with the development of agricultural chemicals in Australia and New Zealand, especially the bipyridyl herbicides.

Characteristics of Bipyridyl Herbicides

Inactivated by contact with ground

Hence any chemical falling on the ground is wasted.

Non-volatile

This again affects placement as there is no "spreading effect".

Translocation

Translocation varies greatly with prevailing conditions, indirectly with light intensity and directly with humidity.

Requirements of a Herbicide

Efficiency

Single droplet studies

Single droplet studies indicate that 0.3% active paraquat in water (this is equivalent to 10 fl. oz. in 4 gallons of water per acre) is the optimium rate of application. But this has little application in the field.

Droplet size

No increase in herbicidal efficiency has been demonstrated with particles of less than 250 microns. Efficiency decreases when particle size exceeds 450 microns. The herbicidal efficiency of particles from 250 to 450 microns is eight times that of particles of 1000 microns. On droplet size affecting efficiency, equivalent results have been obtained using half a pint in 2 gallons per acre with a fan jet nozzle at 30 p.s.i. as one pint in 20 gallons per acre using a spinning disc nozzle.

Requirements of a Herbicide (Contd.)

Volume applied

The factors involved here are:-

(i) must avoid run-off

(ii) must cover target.

Volumes as low as 3 gallons per acre can be used with weeds such as wild oats and cape weed, but 90 gallons per acre may be required to control one foot high barley grass in orchards.

Safety

Drift: This probably occurs no more than with other herbicides, but it is much more evident. A particle size of 200 microns is "critical", but this of course is affected by relative positions of nozzle and target, wind, and so on.

Toxicity: The only toxicity experiences with men have occurred either in cases of suicide or accidental drinking. In a spray situation, only particles of less than 5 microns are capable of entering the lungs where they cause irreversible lung congestion. None of the million users to date have experienced any ill effects.

Uses of Bipyridyl Herbicides

The uses of bipyridyl herbicides are extensive. Among them are pasture establishment, wild oat and wimmera rye grass control, dessication, transpiration reduction to increase grain filling. That is to say, not as a weedkiller but as a tool "to increase intensity beyond management skill ... to replace stock and cultivation with chemicals".

Technique of Application

Local Effect

Application technique will vary with the area in question. For example, most experience in Australia has been either with growth regulatory hormones or insecticides, neither of which demands critical application techniques.

Boom Height

The maximum boom height recommended is 30", and nozzles must be placed so as to provide a complete double overlap to compensate for boom "dip". This overcomes the problem of any missed areas.

Pressure

A maximum pressure of 30 p.s.i. is recommended as this allows larger nozzles to be used, and this in turn results in fewer blockages.

Technique of Application (Contd.)

Volume

The recommended volume is 20 gallons per acre, ranging down to 10 gallons per acre.

Drift Reduction

Types of Nozzles

Fan Jet Nozzles: These have a mass-median diameter of 300 microns (that is, half the droplets are below this size, and half the droplets are above it), thus 10% of these are drift susceptible.

Flood Jet Nozzles: These have a mass-median diameter of around 500 microns. They are used in the tropics where only unskilled labour is available. They are used at pressures of from 10 to 15 p.s.i., each jet covering a swathe of from 5 to 6 feet width. Flood jet nozzles have a "drift potential" of only 1.5%.

Solid Stream Jets: Solid stream jets have a mass median diameter of 900 to 1,000 microns, and less than 0.5% "drift potential". There are several types of nozzle which provide a solid stream jet, that is to say "dribble bar", "drilled disc", and "vibra-jet" (this is similar to the dribble bar except that the output pressure can be controlled). Despite the large diameter particles, tests have shown the herbicidal efficiency of solid stream jets to be comparable to that of fan jets with all species except wire weed (Polygonum arviculare).

Misting Machines

The mass-median diameter of sprays from misting machines is less than 200 microns, and thus the drift potential is greater than 50%. Misting machines are not recommended for the application of bipyridyl herbicides because of this drift potential and the fact that particles capable of entering the lungs and blood stream are produced. Where used, it is advised only to operate at half throttle and to use a light face mask.

Aerial Application

Complaints following aerial application have occurred up to 3 miles away from point of application. The plane was much higher than the originally recommended 10 feet, and the nozzles were pointing forward in to the air stream. It is now recommended to fly as close to the ground as practicable, to use larger aperture nozzles (D46), to maintain pressure at 40 p.s.i., to point nozzles away from air stream and to remove the nozzles at wing tip vortices if there is a risk of damage due to drift. It is also recommended to switch on late and off early for each run, and to finish with runs along the headlands. The problem of wind can be overcome by using "vibra-jet" nozzles with high pressures.

QUESTIONS:

Nelson Johnson:	What is the future of the spinning disc?
Answer:	Not happy with them when used by farmers. Possibly with hydraulic power, and with contractors.
Johnson:	Effect of surfactants?
Answer:	Have looked at "thickening agents" but these show no advantage. They seem to increase the number of large droplets but maintain the number of smaller ones. Some surfactants seem to be more effective than others on a species basis. For example, fat hen is susceptible to some. An investigation of emulsifiable oils has given some improved effect.
P. Parsons:	Is a cross wind recommended for aerial spraying?
Answer:	Yes, but we consider accurate working more important.
Parsons:	Effect of cross wind on vortices?
Answer:	Use solid stream.
Parsons:	Any difference in swathe widths with cross winds and height interaction?
Answer:	Spraying not advised in winds over 5 m.p.h.
George Newby:	Is there any effect of speed of travel on solid stream jets?
Answer:	Developed for Great Britain, and usually operated at 4 to 5 m.p.h.
Parsons:	Is there any work done on assessing advantage of horizontal movement of particles?
Answer:	This is hard to assess with paraquat due to a 100% kill no matter what method is used.
E. Boersma:	What is the effect of light intensity?
Answer:	Strong light may entirely stop translocation. In winter in England, paraquat may take from a week to a month to take effect. It may take a week during winter in Australia, but only 20 minutes in summer.
Boersma:	What is the effect of humidity?
Answer:	Important in Great Britain, but hard to assess in Australia because it increases towards dusk and is thus confused with light intensity. Moisture stress is very important.
Johnson:	Is this the reason for such a good result in the tropics?
Answer:	Yes.
Chairman:	Is the report that only 40% of the dose required for a good result at midday in the tropics effective at dusk true?

Questions (Contd.)

Answer: Yes.

Parsons: What effect has paraquat on wimmera rye grass?

Answer: Can be killed with low volume applications (one to two gallons per acre) if the application rate of chemical acre is increased. Aerial application results have been confusing - in New Zealand up to 30 gallons per acre is required.

Johnson: Maybe this is because of the greater vigour.

Parsons: Half a gallon per acre, while quite effective in Western Australia, won't work here.

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CORRESPONDENCE

Letter received concerning Weed Control in Crops:-

"I was interested to read the article entitled, 'Weed Control in Crops', pp.2 and 3 of Newsletter No. 68/2 of May, 1968.

"The author clearly would like to build up a bank of information which would enable extension officers and others to determine with some precision when it would be profitable to spray a crop and when it would not.

"I question whether mere numbers of weeds to the square foot, yard or acre would, in fact, lead to such a happy state of affairs. The competition between weed and crop is determined by many factors other than mere relative numbers. While it is true that under controlled conditions, it is possible to determine fairly precisely the effect of a given number of weeds on yield of crop, under field conditions this may not be so.

"Factors which have to be taken into account include nutrient level, pH, available moisture, competition for light and the time in the life of the crop at which the weed makes its appearance.

"I am not advocating that weed density should not be recorded, indeed I think it should. I wish only to suggest that the way forward may not be so simple as it may appear at first glance.

"When experiments are carried out, it is not impossible, though it may be somewhat tedious, to count the numbers of weeds. However, in practise we find that weeds are often not evenly distributed, so that it may be essential to make counts on many quadrants if an accurate figure is to be quoted. As to whether the weeds are counted after treatment will depend greatly on the kind of treatment given.

Correspondence (Contd.)

"If weeds are simply stunted, but nevertheless no longer serious competitors, counts will give no useful information, but bulk estimates will do so. If they are killed outright, then counts may be meaningful, though the meaning may have to be modified if the survivors grow large as a result of the removal of intra specific competition.

"These are difficulties that the experimenter must solve to the best of his ability.

"Returning to the question of initial weed counts and crop response; let us take an example of the kind of problem we have.

"Swan and Furtick (1962) showed that one plant of Amsinckia intermedia per square foot reduced wheat yields by 20 bushels per acre. In victoria in 1964 and 1965 such a low density of Amsinckia spp. would certainly not have influenced wheat yields to the extent of more than one or two bushels per acre. Of course, we are dealing with different species of Amsinckia, different fertility levels, different crop varieties, different climatic conditions. In one case an expensive herbicide would be well worth using, in the other case it is doubtful if any profit would accrue.

"In Australia, we have very wide differences in soil type, pH, fertility climate, weed species and wheat varieties so that the number of weeds present seems to be a rather unlikely way of determining the profitability of spraying unless it is combined with a very detailed and thorough local experience.

"Interpretation outside the area of detailed experience could be misleading.

"Is not the same kind of difficulty met with in the case of soil analysis?

Yours sincerely,
Pete Gregory."

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Weed Society of N.S.W.,
C/- Department of Agriculture, Sydney.
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