

THE WEED SOCIETY / OF NEW SOUTH WALES

P.O. Box K287, Haymarket, N.S.W. 2000

PRESIDENT: Dr. L.W. Smith

HON. SECRETARY: Mr. W.J. Burke

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ANNUAL REPORT FOR 1979

Usually when one looks back on the Society's activities for the year, the degree of success can be measured in terms of the number of interesting, well attended symposia, field trips and lectures for members.

1979 ranked a little below average by this criteria, yet, I think, it was the golden year of our fourteen years history - because Society members succeeded in staging the Seventh Conference of the Asian Pacific Weed Science Society in Sydney, last November. There were 311 registrants from Australia, Canada, Hong Kong, India, Indonesia, Japan, Korea, Malaysia, New Zealand, New Calidonia, Philippines, Republic of China (Taiwan), Singapore, Solomon Islands, Thailand and the U.S.A. Just over 100 papers were presented at the four sit-in days. Delegates took a day off in the middle of the Conference to attend either of the tours offers:- (1) A Hawkesbury College excursion featuring an extensive demonstration of selective weed control trial plots in vegetables plus direct drilling of cereals into pasture land, (2) A "Weeds in Urban Bushland" symposium, open to the public, which was attended by approximately 200 people. The Conference budget was \$56,000 which is about thirty times the annual subscription receipts for our Society. The Proceedings totalled 480 pages, which is a larger volume than all our past State Society Proceedings combined. Furthermore, the whole Conference ran with clock-like precision: yet there seemed ample time for discussions between sessions. I would like to compliment the Asian Pacific team: President Dr. P. Michael, Organising Chairman Mr. A. Mears, Financial Director Mr. A. McLennan, Editors Drs. R. Medd and B. Auld plus Dr. B. Lowe, J. Toth, K. Green and M. Barrett.

During the year our Society put on three functions specifically for members. About 45 people attended the afternoon symposium at Sydney University in August entitled "Direct Drilling and No-till Farming in New South Wales - Present Situation, Potential, Problems and Possible Consequences". Eight speakers, with distinctly different interests in the topic, shared the presentations, making the overall function highly successful.

We must thank Andrew Leys, now on a 3-year doctorate programme at the University of Illinois, for organising the field tour of various weed control sites in wheat and lupins in the Wagga area in early October.

At the third function, Jim Newman of I.C.I. (U.K.) Ltd., Jealotts Hill Research Station discussed, very well supported by slides, the wide variety of techniques he uses to evaluate pesticides for possible effects on the environment. Jim addressed us on this subject nearly five years previously and it was most interesting to hear how testing of pesticides on soil micro-organisms, birds, fish and sundry forms of non-target animal life has advanced in the meantime.

The Society's Annual Dinner was held in conjunction with the Asian Pacific Weed Science Society Conference Dinner at the Argyle Tavern, The Rocks.

The Executive met six times during the year. I would like to make special mention of Warwick Felton's attendance at most of these meetings, since he had to make the long trip down from Tamworth. We appreciate your assistance and your persistence Warwick. Incidentally, Warwick, Andrew Leys and Dick Medd were our district reporters for the Newsletter, a new innovation in 1979 to get some country news circulating.

The logo competition was concluded during the year. The entry by Norm Barlow of Cowra was judged the best of the four designs submitted. In awarding the prize to Norm the Executive recommended that the logo be polished up by an advertising agency before being implemented as our official emblem.

We lost the services of President, Dr. Leon Smith for the last five months of 1979 and Jim Swain capably filled in for Leon. John Toth took over the unrewarding tasks of editing and distributing the Newsletter. I would like to compliment Leon not just for his year of leadership, but for his efforts to keep the Society functioning while he was away. In fact, he seemed to be working for the Society until he stepped on the plane.

As one closes the book on another year it is fitting to look at the open page for 1980. It is our Society - to be what we, as members, want to make it.

W.J. BURKE
Honorary Secretary

STOP PRESS

1. The next CAWSS Weeds Conference will be held in Queensland on the Gold Coast from 12th - 18th September 1981. Further details will be available in the next Newsletter.
2. The first issue of the Australian Weeds Quarterly is due to be published in June 1980. This issue, which is a pilot run, will be mailed free to all members of the society.

Income and Expenditure Account for the Year ended 31/1/80

<u>Expenditure:</u>	\$	<u>Income:</u>	\$
Newsletter (Printing, postage)	149.63	Members Subscriptions	1,473.00
CAWS Society Membership	40.00	- Ordinary	933.00
Audit Fee (1979)	12.50	- Corporate	525.00
Seminar Sydney University		- Ordinary Arrears	15.00
"Min. Tillage"	127.91	- Corporate Arrears	--
Dr. P.W. Michael	18.69	Interest Investment	203.84
Dr. R.R. Baldwin			
Accmdtn	42.82		
Mr. D. Jones			
Air Fare	<u>66.40</u>		
Design Logo Award Mr. N. Barlow	29.00		
Seminar "Direct Drilling"	70.70		
Mr. R.R. Baldwin Air Fare			
Prize Donations Sydney Uni.	80.00		
Bank Fees	15.91		
Stationery	2.64		
Postage	13.40		
Balance (being excess of income over expenditure transferred to accumulated Fund)	<u>1,135.15</u>		
	<u>1,676.84</u>		<u>1,676.84</u>

Statement of Assets as at 31/1/80

<u>Accumulated Fund</u>	<u>31/1/80</u>	<u>31/1/79</u>
Balance	3,311.08	2,225.89
Add Excess as per Income & Expenditure	<u>1,135.15</u>	<u>1,085.19</u>
	<u>4,446.23</u>	<u>3,311.08</u>
<u>This is represented by:-</u>	<u>31/1.80</u>	<u>31/1/79</u>
Cash on hand	5.96	--
Cash at Bank (Trading Account)	457.51	893.16
Investment (N.S.W. Permanent Building Soc)	3,997.71	2,393.87
Sundry Debtor (APWCC 1979)	<u>78.05</u>	<u>78.05</u>
	4,539.23	3,365.08
<u>Less Subscriptions in advance</u>		
Ordinary	68.00	24.00
Corporate	25.00	--
Refund Due Annual Dinner Subscription	<u>--</u>	<u>30.00</u>
	<u>4,446.23</u>	<u>3,311.08</u>

Statement of Movement in Asset Investment (N.S.W. Permanent Building Society)

Investment (as per Statement of Assets 31/1/79)		\$2,393.87
<u>ADD</u> Interest to 31/5/79	-	96.75
Additional Investment from Funds 2/10/79	-	1,400.00
Interest to 30/11/79	-	<u>107.09</u>
		<u>1,603.84</u>
Total Investment as at 31/1/80		<u><u>\$3,997.71</u></u>

A.B. McLENNAN
Hon. Treasurer.

In my opinion the above Income and Expenditure Account and Statement of Assets have been properly drawn up so as to present a true and fair view of the affairs of the Weed Society of N.S.W. for the year ended 31/1/80.

C. BARGWANNA, A.A.S.A. (S)
Auditor.

The Summary of the Presidential Address by Dr. Leon Smith to the 14th Annual General Meeting will be held over until the next Newsletter.

PART 3 OF GLOSSARY OF TERMS IN WEED SCIENCE PREPARED BY EXPERT COMMITTEE ON WEEDS,
CANADA

Impregnated fabric or string formulation	Fabric(s) or fibre(s) impregnated with a pesticide, i.e. repellent impregnated jacket, repellent impregnated towellettes, herbicide string.
Incompatible herbicide	Not capable of being mixed or used together.
Incorporate	To mix or blend a herbicide into the soil.
Inert ingredient	Inactive ingredient. Any chemical or material in a herbicide mixture that has no pesticidal effects when used alone. See formulation, carrier.

Invert emulsion	An emulsion having the water suspended as small droplets in oil. See emulsion.
Label	The printed material attached to a part of a pesticide container, the label lists the names of the pesticides chemical and other ingredients, the amount of the ingredients, registration number of the pesticide, name and address of the manufacturer or formulator, what to use, how much to use and when and where to apply it. In addition a DANGER, CAUTION, or WARNING statement and KEEP OUT OF REACH OF CHILDREN must be on the front label. First aid information in case of accident must be included.
Layby	The time of last cultivation of a row crop.
LC ₅₀	Abbreviation for median lethal concentration which is the concentration at which a toxicant produces a 50% kill of aquatic organisms. It is usually expressed in ppm.
LD ₅₀	Abbreviation for median lethal dose which is the amount of toxicant that produces a 50% kill of the organism being tested. It is usually expressed as mg per kg of body weight.
Leaching	Movement of a herbicide chemical downward through the soil.
Liquid formulation	Clear liquid composed of one or more toxicants only (100% active, or with small amounts of production inerts, or with small amounts of fire suppressants and flame inhibitors, i.e. 97-100% active) for dilution in suitable solvent or ready-to-use. Volatile products may be pre-packaged in pressurized containers, for release as a gas.
Low volatile	A liquid or solid that does NOT evaporate readily at normal temperatures. Formulation of a chemical which, after application, does not tend to vaporize in quantities that may damage nearby plants.
Miscible liquids	Two or more liquids capable of being mixed and which will remain mixed under normal conditions.
Necrosis	Localized death of tissue.
Non-selective herbicide	An agent that is toxic to all plants at specified concentrations.
Noxious weed	A weed specified by legislation as being especially undesirable.

Organic soil	A soil greater than 40 cm in thickness and containing more than 30% organic matter.
Paste formulation	Ready-to-use grease, or ointment composed of toxicant and inert ingredients (may be solid or semi-solid emulsion); may be in stick form.
Pellet	A dry formulation of a herbicide alone or with other usually inert ingredients in discrete particles larger than 10 mm ³ (see also granular herbicide).
Phytotoxic	Injurious to a plant.
Postemergence	After the emergence of a specified crop or weed.
Preemergence (pre)	Before the emergence of a specified crop or weed.
Preemergence incorporated	The herbicide is applied after seeding and incorporated in the soil above the seed before emergence of the crop.
Preplant application (pp)	Herbicide is applied before the crop is planted.

SILVER-LEAF NIGHTSHADE (Solanum elaeagnifolium)

Situation Statement and Progress Report
on Current Research

This Paper was Prepared by:

Mr. A. Leys,
Research Agronomist,
Wagga Agricultural Research Institute

Silver-leaf nightshade (S.L.N.) was of little importance in N.S.W. until about 1960. Since then the spread has been rapid. Spread of S.L.N. is caused by seedlings, germination, sprouting of broken root pieces and creeping lateral roots. Rapid spread is, I believe, due to germination of seedlings. The rapid spread of S.L.N. since 1960 is probably a result therefore of:

1. Steady increase in seed source which is readily spread by stock;
2. A period of wetter than average summers;
3. Intensification of cropping.

Now, more than 12,000 ha of the southern wheat growing area of N.S.W. are seriously infested, with other areas occurring in the central and northern wheat zones and the M.I.A.

Importance as a Weed:

In pastures, S.L.N. competes directly with summer growing pastures such as lucerne and severely reduces production of winter growing pastures such as sub-clover.

In winter cereals, S.L.N. grown on the fallow sapping moisture and nutrients for subsequent crops. In-crop infestations occur during the spring and these may in late crops, interfere with harvesting and contaminate the sample.

Overseas, S.L.N. is a serious competitor in summer irrigation crops and poses its greatest problem in this area.

Poisoning of livestock, although rare, has occurred.

Control

Large Area Infestations:

Cultivation only enhances the spread of the weed.

There is no chemical available for control of large area infestations. My experience has been that even Tordon® 50 - D at 20L/ha (\$140/ha) will only provide 70-80% control. Because of its cost and persistence in the soil, it cannot be considered a practical solution.

For large area infestations, we can only hope to contain the spread to other areas. This is best achieved by:

- a) preventing seed production. Use of 2,4-D (1L/ha 2,4-D ester plus wetter; or 2L/ha 2,4-D amine plus wetter), ploughing or slashing;
- b) prevention of spread of seed by confining stock to an area where there is no seed for 3 to 4 days;
- c) spraying a strip of Tordon around the fenceline.

Small Area Infestations:

Farmers should work from the least affected paddocks to the worst, spraying with Tordon 50 - D in a 1% solution plus wetter to wetness and including an area of a metre around each colony.

Soil sterilants such as bromacil and Velpar® appear useful but no better than Tordon.

Roundup as a 2% solution is more expensive than Tordon but may be useful following good growing conditions in or near horticultural and irrigation areas.

Current Research

Biology:

- seed production, viability and longevity;
- further examination of factors affecting seedling emergence and survival (10 fold increase under cultivation - high mortality during dry summers);

- plant emergence and phenology.

Ecology:

- effect on pasture and cereal yields;
- rate of colony spread.

Control:

- evaluation of additives to Tordon and Roundup (surfactants, oils, ammonium sulphate, synergistic herbicides);
- evaluation of new application methods (herbicide roller, rope-well applicator);
- comparison of effectiveness of competing perennial pastures;
- evaluation of the effect of rice cropping on weed populations.

Summary of talk given to the Weeds Science Society of S.A. by Mr. G.B. Baldwin of the S.A. Department of Agriculture and Fisheries.

Spray Droplets:

Droplet Diameter and Volume

Spray droplets are generally measured in microns (μm), one micron being 1/1000 mm. When a liquid is sprayed through a nozzle it produces a spectrum of droplet sizes which remain virtually constant. However, in conventional spraying equipment, the spray produced usually has a fairly wide droplet size spectrum, for example a spray with an average droplet size of 250 microns may in fact contain droplets ranging from 20 to 2000 microns in size. In any spectrum it is important to realise that it always contains more small droplets than large ones.

Comparative droplet sizes	
<u>Diameter μm</u>	<u>Type of classification</u>
15 μm	Aerosol
30 μm	Cloud
100 μm	Mist or fog
200 μm	Drizzle
500 μm	Fine rain
1000 μm	Medium rain

Terminal Velocities

Droplets released from the spray nozzle come under the influence of gravity and either accelerate or decelerate as they fall until reaching a velocity (Terminal

velocity) where the air resistance equals the droplet fall.

Some Terminal Velocities

Diameter um	T.V. m/sec in still air	Time of fall if released from height of 3 m
1	0.00003	28.1 hrs.
20	0.012	4.2 min.
50	0.075	40.5 secs.
100	0.279	10.9 secs.
500	2.139	1.6 secs.

The table above assumes that droplet size remains constant which is rarely the case because of evaporation etc.

Clearly droplets with a T.V. of 0.075 m/sec (7.5 cm/sec) or less are virtually airborne and while the larger droplets fall relatively quickly and almost vertically downwards on to the upper surface of vegetation or soil below, the smaller droplets are readily influenced by air currents, being swept around and under the vegetation so that they are deposited on both the upper and undersurface of leaves. With any given volume of spray the smaller the spray droplet size the greater the surface area covered. Thus for better coverage and more efficient use of pesticides, the finer the droplets, the better, provided that the droplets reach the target area.

Table showing droplet size in relation to droplets per cm² when applied at 1 L/ha

Diameter um	Number of droplets per cm ²
10	19 099
50	153
200	2.4
1000	0.019

In obtaining increased coverage, reducing droplet size is more important and economical than increasing volume of output. It has been said that for weed control the Minimum Droplet density should be greater than 20 droplets/cm² with droplet diameters in the range 200-1000 um.

For insect control this should be increased to more than 50 droplets/cm² but with droplets in the range of 100-500 um.

It should be noted that the higher the volume used the larger the droplets can be, and the lower the volume the smaller the droplets to attain adequate leaf coverage.

Range of Spray Volumes Used

HV High volume	more than 400 L/ha (35 g/acre)
LV Low volume	from 5 to 400 L/ha (0.5-35 g/acre)
ULV Ultra low volume	less than 5 L/ha (0.5 g/acre)

The application rates used have depended on the type of vegetation, the kind of pest to be controlled, the availability of water or the preference of the applicator.

There has been a trend in recent years to reduce spray volume so as to:-

1. Increase sprayed area per volume of spray mix.
2. Rapid treatment of large areas within a limited time to control certain pests.
3. Increase droplet size.

Horizontal Drift of Droplets (Droplet Size Constant)

Droplet Diameter um	Distance travelled horizontally when released from height of 3m wind 1.34 m/sec (5 km/hr.)
1	155.7 km (97.5 mls)
20	388 metres
50	54 metres
200	5.7 metres
500	2.1 metres

Controlled Droplet Application

With conventional spray equipment the major problem is the variability in droplet size within the sprayed material.

The ability to generate uniform droplets by means of a rotary atomiser creates very exciting possibilities for weed control. At the Weed Research Organisation in Britain experimental equipment has been developed for the controlled drop application of herbicides (CDA). Rotary atomisers are being used to produce drops of different sizes in the range 150-350 um and to apply these in volumes between 5-45 L/ha.

Using a dicamba based mixture, weed growth was just as effectively controlled with application as low as 20 and 40 L/ha using the CDA technique with a constant droplet size of 250 um as was obtained from conventional equipment applying 225 L of spray mix per ha.

With CDA it is possible to apply very low volumes of spray mix to achieve the same degree of control as with much higher volumes required under conventional spraying methods.

A lot will now depend on designing practical field equipment which will allow rapid work rates, constant accuracy and the ability to handle a wide range of materials with easy decontamination between them.

As the problems are overcome and this could include the reformulation of chemicals for CDA use, we may see the evaluation of one of the most significant developments so far in the field of weed control.

Editor's Note: although this talk was given in 1977 I feel the information is still very relevant and of interest to us all today.

PUBLICATIONS OF INTEREST TO WEED SCIENTISTS (from Infoletter Jan-Feb 1980)

- * New from the International Plant Protection Center, a 31-page booklet, "Knapsack Sprayers; Operation, Maintenance, and Accessories." Authors Frank Fraser and Larry Burrill have used illustration to describe various functions and, in particular, present details for constructing a variety of multi-nozzle booms. Paperbound, in English, US\$3 surface postpaid, from: IPPC, Oregon State University, Corvallis, OR 97331 / USA.
- * Copies of the "Proceedings of the 2nd International Symposium on Parasitic Weeds" are available, at a cost of US\$5, from: A.D. Worsham, Dept. of Crop Science, NCSU, Raleigh, NC 27607 / USA.
- * To mark half a century of agricultural research at its Jealott's Hill Research Station, Imperial Chemical Industries commissioned publication of a hardbound volume recounting the myriad activities - advances and failures alike - that have occurred. The 160-page "Jealott's Hill, fifty years of agricultural research, 1928-1978", edited by F.C. Peacock, includes numerous colour photos, and offers insights on products and people. In English, Pounds 4.50, from: ICI Jealott's Hill Research Station, Bracknell, Berks. 12RG 6EY / UK
- * The International Weed Science Society (IWSS) has published a 12-page leaflet, "Weed science activities at major international agricultural centers". Jerry Doll, formerly weed scientist at one of the agricultural research centers, spearheaded the project. Free, from: IWSS Secretariat, IPPC, Oregon State University, Corvallis, OR 97331 / USA.
- * A hardbound, revised edition of "Nebraska Weeds" was published in 1979 by the Nebraska Department of Agriculture, Weed Division, Lincoln, NE 68509 / USA. Full colour photos of weeds, weed seeds, and seedlings are accompanied by taxonomic descriptions. The 312-page work, in English, includes a vegetative key, and costs US\$8.
- * From the Vermin and Noxious Weeds Destruction Board of Victoria (Australia) come two new pamphlets, #77, "Serrated Tussock in Victoria (Nassella trichotoma, (Nees.) Hack. ex Arech.)", by D.W.A. Lane and R.V. Edgar (5 pages), and #78, "Biological control of noxious weeds in Victoria", by R.L. Amor (9 pages). Write: Keith Turnbull Research Institute, P.O. Box 48, Frankston, Vic. 3199 / Aust.
- * Technical aspects, history, and many other facets of ultra-low volume spraying are appealingly presented in a four-colour booklet, "ULV Spraying". The free, illustrated, 12-page publication, in English, can be requested from: Publication, Shell International Chemical Co., Shell Centre, London SE1 7PG / U.K.
- * On behalf of the Australian Weeds Committee, the Pesticides Section, Department of Primary Industry, Canberra, A.C.T. 2600 / Australia, has prepared and published "Guidelines for Field Evaluation of Herbicides". The very thorough paperbound volume, sets forth the minimum requirements of field trials designed to produce acceptable evaluations of herbicides. The publisher has a limited number of copies for free distribution.

* Wiley-Interscience, 605 Third Ave., New York, NY 10016 / USA, has announced a new title, "The Science of 2,4,5-T and Associated Phenoxy Herbicides", by R.W. Bovey and A.L. Young. The text emphasises the toxicological and environmental effects of the phenoxy. In English, hardbound, approximately 565 pages and US\$33.95.

N.S.W. WEED SOCIETY PROGRAMME, 1980

Advance notice is given of the following tentative programme arrangements for 1980:

- 25th June - Mr. Wopshere, Senior Research Scientist, C.S.I.R.O. from the International Biological control Unit, Montpellier, France, will be visiting B.C.R.I. Rydalmere, and arrangements are in hand for him to speak to the Society at Rydalmere that day on Recent Developments in Biological Control.
- August 1980 - It is hoped to arrange a Northern Field Trip this year (Warwick Felton) similar to the one held last year in Southern New South Wales - weather conditions permitting.
- October 1980 - Field Day to inspect and discuss some recent work by John Toth on Control of Blackberries.
- November 1980 - Annual Dinner.

EDITOR'S NOTE:

Any comments about the Newsletter are always welcome, as well as any articles, information, etc. for inclusion. For instance, Ian Barnett has queried whether the definition for 'Pre-emergence incorporated' in this newsletter is applicable under Australian conditions. He says that under our conditions, (wheat crop) most pre-emergence incorporated herbicides are incorporated before the sowing of the seed.

LET'S HEAR WHAT YOU THINK ABOUT THIS AND THE OTHER DEFINITIONS GIVEN.

Do they need modifying for Australian conditions?