



MESSAGE FROM THE EDITOR

Dear Colleagues

Although slightly delayed by one month, I am pleased to bring out the first APWSS Newsletter for the Year 2019 in this month of May. As you are aware, I've now established the new 'Weed' Journal for the Society. This meant burning the midnight oil; hence, the Newsletter was slightly delayed.



Journal Update

Members are aware that APWSS has been trying to start a Journal for several years, because the costs of publishing in the existing lead journals of Weed Science are unaffordable to Weed Scientists of most emerging economies and developing countries. We now have the Platform- an "On-Line" Journal, which will only charge US \$ 30 per published article. It will then be available, free of charge, for perpetuity.

Needless to say, I have been busy. Here is a brief summary of progress with regard to the Journal:

- Our Journal is entitled '**WEEDS**' with a by-line to qualify ownership (i.e. *Journal of the Asian Pacific Weed Science Society*).
- It is hosted on the 'Scholastica' on-line academic journals platform for an annual subscription of US \$ 1200.
- The platform is managed from Chicago, USA, and has more than 600 journals and highly reputed societies as customers.
- Please check the following Links:
 - <https://scholasticahq.com/browse-journals>
 - <https://scholasticahq.com/publishing-features>
- I have included an **image of the Web page** on Page 3 of the Newsletter.
- I invite all colleagues to make the Editorial tasks easier by sticking to the **Author Guidelines** that we have provided.
- Given the constraints, we have decided to publish only TWO issues of the journal per year, commencing in 2019.

- We do have a strong Editorial Board, which will strive to maintain the high quality of peer review required and high standards of integrity.

On the behalf of APWSS, I thank contributors from different countries for providing interesting news items for this Newsletter. More contributions to future Newsletters are welcome from anyone.

Sep 2019 Conference

Just some thoughts on the up-coming conference. APWSS needs the younger generation to be inspired and excited about belonging to a professional community. To promote this, I am organizing a pre-conference "**APWSS Young Scientist Forum**" with Khawar Jabran. It is essentially a "**meet-and-greet**" event, with the opportunity to meet and listen to some renowned senior scientists and also, lay the platform for closer engagement with the APWSS.

I encourage those who are interested in this event to immediately get in touch with us, so that we can ascertain numbers attending. We will soon upload a Notification on the official Website.

Dr. Nimal Chandrasena

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MESSAGE FROM THE PRESIDENT

Dear APWSS Members

I thank our office bearers for their commitment and energy to maintain our Society's profile and activities. I notice with great interest, the launching of the new journal. It will surely lift our Society's profile further, both globally, and in the region.

As the Editor has explained, the Journal's primary purpose is to allow our researchers to publish papers without incurring unaffordable publishing costs.



As the President of APWSS, I encourage everyone to consider preparing articles suitable for consideration by the Journal, following the Guidelines provided.

We are now heavily into organizing the 27th APWSS Conference, which will be held on September 3-6, 2019 in Kuching, Malaysia. Members are aware that the theme of 27th APWSS Conference is "**Weed Science for Sustainable Agriculture and Environment**".

As the Chairman of the Organising Committee, I invite all of you to participate in the upcoming conference. The Conference Website is:

<http://www.apwss2019.org/>

Basic information such as fee, conference venue, subtopics of the programs regarding the conference and venue have been uploaded. A promotional video 'sneak peek' of our Conference venue is available on the website.

The online registration process through the Conference website is now open.

Contributory papers were earlier due on 31 May. But, due to many requests for an extension, the Organizing Committee, with approval from the APWSS Executive, has extended the deadline to 30 June.

This would be the final deadline, after which we may not be able to accommodate any contributions.

Weed management will continue to be one of the critical issues in the current world, which is showing the impacts of a rapidly changing climate. Many weeds are posing increased threats to crop production, particularly, due to increased temperatures, and elevated CO2 levels associated with climate change, both of which encourage their growth. Climate change is also bringing about rainfall shifts, more frequent droughts, floods, sea water intrusions, which affect various ecosystems and native vegetation.

Climate change may bring about a change in the weed flora of different ecosystems. Obtaining a better understanding of weed ecology and biology will help in better weed management. We anticipate that the interactions among conference attending weed scientists, academicians, policy makers, and industry players will result in evolving better weed management solutions.

The Island of Borneo highlighted

The Conference will be held in East Malaysia in the city of Kuching. It is the capital of Sarawak and the largest city on the island of Borneo. Kuching is famed for Bornean flora and fauna, its tasty Sarawakian dishes, as well as its rich history and diverse multi-racial culture. A visit to Kuching will undoubtedly be memorable for anyone, because of the special nature of the Island of Borneo. I hope you will realize that and make use of the opportunity!

With the assistance from the APWSS Ex-Co, we look forward to building an exciting and rewarding programme for all of you! We look forward to seeing you in 2019 at the 27th APWSS Conference in Kuching, Malaysia.

If anyone needs more details, please contact me directly. Thank you.

Dr. Abdul Shukor Juraimi

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MESSAGE FROM THE GENERAL SECRETARY

Dear Colleagues

I am pleased that Dr. Nimal, Editor of the APWSS, has continued to make time to put together another useful Newsletter.



As I have said previously, despite being busy with our own jobs, both of us are making personal sacrifices to make our Society more relevant to Members. This task continues to be difficult, despite the fact that we live in an era of mobile technology and the internet, which is supposed to make communications easier. We seek your active participation in the Society's activities, so that we can sustain the Society and reap benefits from the professional and social interactions promoted by it.

We are continually updating our Website. The proceedings of most of the previous APWSS Conferences are worthwhile reading for our junior scientists, and are available for downloading from the Website: <http://apwss.org/index.htm>



Weeds - Journal of the Asian-Pacific Weed Science Society

Dedicated to understanding weeds and responsible weed management

[For Authors](#) [Editorial Board](#) [About](#)

Weeds – Journal of the Asian-Pacific Weed Science Society is a peer-reviewed online, journal dedicated to understanding weeds

Published content coming soon.

The new 'Weeds' Journal – as users will see on the On-line Platform

There are several other matters, which are worthy of repeating, related to our Society, as we prepare for the 27th Conference. They are as follows:

APWSS New 'Interim' Constitution – to be ratified in Sep 2019

- Our new 'interim' Constitution, which was adopted by the Ex-Co and Members in 2017 at Kyoto, will be ratified in Sep 2019 at the forthcoming Annual General Meeting. Already, a few minor changes that may be needed to improve our functions, appear to have emerged. I encourage all Members to read it on the Website and provide any feedback you may have. It is still not too late! Anyone interested can check the Constitution on:

- <https://apwss.org/apwss-membership.htm>
- <https://apwss.org/index.htm>

Member Country Society Updates

- We, as the Office bearers of the Society, have deep concerns about Member countries and Country Representatives, who form the Ex-Co. The current list is available on our Website. However, these need updating as some representatives have changed with time.

- I wrote to the Member Countries to nominate their Representatives recently. As of 25 May 2019, I have received a very positive response from a great majority of Member Countries. I will be in touch with the nominated representatives in due course, so that we can plan ahead as we prepare for the next AGM.

Life Members

For a while, I have been encouraging all of the APWSS Members, especially the younger Weed Scientists to become the Life Members of the APWSS and strengthen the Society. I am pleased to say that we've had at least 6 new Life Members in the past few months - a very encouraging sign. Please feel free to contact me in this regard.

APWSS Needs a 'Home'

Recently, Dr. Nimal informed the officials of the Ex-Co of the difficulties in establishing a new Bank Account for the Journal, based in Australia. The existing APWSS Accounts have been running smoothly in Australia for nearly 20 years. However, in the current financial environment and stricter regulation, he was unable to establish a new Account dedicated to the Journal.

Among the reasons for this difficulty are the facts that the Society is not incorporated in any country; it does not have a 'home' address and a place that can be called its "head quarters".

The Journal has begun to operate, linked to the existing APWSS Account. However, what the recent experience revealed is that we need to urgently seek a permanent home for the Society.

This is a serious matter looming for the APWSS that requires an informed and disciplined conversation and a frank exchange of ideas. We will soon be calling for nominations in this regard.

Prepare Nominations for hosting the 28th APWSS Conference in 2023

I have a feeling that Member Countries are aware that bids to host the 2023 Conference are due at the Sep 2019 Conference in Kuching.

I encourage all Member Countries to consider the opportunity and prepare strong and competitive bids, which need to be presented to the Ex-Co Meeting at the commencement of the September 2019 Conference. If you need to discuss the matter of how to prepare an impressive bid, please feel free to contact me.

Please do submit Abstracts of your research papers by **30 June 2019** and actively participate in our upcoming 27th APWSS conference in Malaysia.

Thank You.

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APWSS 'YOUNG WEED SCIENTISTS FORUM' – AN UPDATE

Dr. Khawar Jabran

As I said in the previous Newsletter, we now have a 'Young Weed Scientist Forum' under the auspices of the Society.



We are still in early stages of establishing a vibrant forum - to give a special 'voice' to the young Weed Scientists of the region and create opportunities for professional grooming in Weed Science, training and communications. It is also very much a part of succession planning for the Society's future.

The idea, proposed by Dr. Nimal, accepted by the APWSS Ex-Co, was endorsed by the APWSS General Body in 2017 at Kyoto. The Forum is now written into the New APWSS Constitution.

We have now planned a **"MEET AND GREET"** Event, as a "pre-Conference" Event, at the September Conference.

With provisional programming, being done at present, this event **could be held on 2nd September 2019 (Monday), pre-conference.**

All interested Young Scientists are encouraged to contact me in this regard, if they want to participate. We expect the Event to be about two h (2) duration, at a cost-neutral venue, near the Conference venue. More details will follow, but please let us know – if interested in attending.

EXPECTED OUTCOMES

- Establishing a framework for a direct voice for the Younger Scientists within APWSS;
- Fostering a culture of open and direct communications between the junior and senior scientists on sharing of knowledge on key and emerging issues;
- Develop some collaborative projects between participants junior and senior scientists;
- Identify some possible avenues for future research funding, as well as training needs; and
- Developing potential leaders of APWSS Society.

I am privileged to have been asked by Dr. Nimal to be the Forum's First Chairperson. We will benefit greatly from the guidance of the senior members in the Society, particularly, the Senior Advisory Council and the Ex-Co. The more participants we have, the more vibrant, the Forum will be.

OBJECTIVES

- Provide APWSS's Young Weed-Scientists a Forum, through which they can easily communicate with each other, co-ordinate any activities, exchange information, and learn about future opportunities.

- Arrange special Training Programs for the Young Weed Scientists to enhance their scientific thinking and approach.
- Increase linkages among young and senior Weed Scientists and facilitate young Weed Scientists obtaining assistance from Seniors to strengthen any aspect of their professional life (i.e. thesis writing, research proposals, or improving research manuscripts).
- Arrange activities, such as on-line lectures, and special sessions at future APWSS Conferences.

SPECIAL PLENARY SESSION

- Following a suggestion from Dr. Nimal, the Malaysian Organizers have agreed to allocate a Special Plenary Session for the "Young Scientists Forum" at the 27th APWSS Conference. This will be dedicated to some of the upcoming Young Scientists to demonstrate their research to the full Conference audience.
- For the Young Weed Scientists Forum, presentations are likely to be selected by a panel, based on merit and country representations.

So, please ensure that you read Paper submission instructions on the Website and prepare impressive Abstracts.

FUTURE PROGRAM

- I am proposing the establishment of social media pages for the Young Weed Scientists Forum. I intend to have a plan to make the platform, pages, and provide its details soon. This will help to bring closer the Young Weed Scientists and increase coordination and cooperation between them.
- Also, this may serve as a place where they can post/ask/discuss their research and other related questions and receive response from fellows and senior colleagues.
- The same on-line-space can be used to convey messages to the Young Weed Scientists, such as those related to various scholarships/post-doctoral opportunities, jobs, etc. It will also be a linkage mechanism between Young Weed Scientist and the Seniors. With guidance of our Seniors, we will moderate the discussions.

Young Weed Scientists - please stay tuned for your participation in upcoming APWSS conference in Malaysia, the special session for Young Weed Scientists at the Conference, travel awards, and other exciting activities!

If any Member needs more information and wants to get involved, please contact me directly.

Thank You.

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COUNTRY REPORT – NEW ZEALAND

Report for APWSS, May 2019: Weed Science Activities in New Zealand

Some important recent developments in NZ Weed Science include the [NZ pastoral sector Weed Science Strategy \(2018 – 2028\)](#) led by Dr Graeme Bourdôt, and a new programme on herbicide resistance led by Dr. Trevor James (AgResearch). The pastoral sector weeds strategy was developed in consultation with industry stakeholders and sets out a 10-year plan to address key weed research needs in NZ.

Key research priorities include alternatives to herbicides, biosecurity threats (new weed incursions, and sleeper weeds), and managing herbicide resistance. These ambitious programmes involve many collaborators, nationally and internationally, including Dr. Kerry Harrington (Massey University), Professor Phil Hulme (Bioprotection Centre, Lincoln University), and Dr. Ian Heap (International Survey of Herbicide Resistant Weeds) and will also provide training for new Ph.D. students and post docs.

The [NZ Plant Protection Society](#) will hold its next conference 13 – 15 August 2019, at Stamford Plaza, Auckland. There will be a weed science session including presentations on mowing roadside weeds, seed biology of grass weeds, biocontrol of thistles using pathogens, and goat grazing. The session will open with a keynote talk by Professor Joe Neal (North Carolina State University, USA). Prof. Neal will talk about 'alternatives to glyphosate', a topic of much interest in wake of litigation in the USA over concerns about safety to human health.

The topic was recently addressed in the [NZ media](#) by Dr. Kerry Harrington and industry representatives. Prof. Neal will remain in NZ on sabbatical at AgResearch (Lincoln) until Feb 2020 working on various projects, including the potential for biocontrol of *Nassella tussock*.

The NZPPS executive continue to discuss improvements to the society's conference and journal to capture work from a greater diversity of practitioners in plant protection. The current requirement to publish in the society's journal to present at the conference is also under discussion.

The recent NZPPS newsletter has advertised the upcoming APWSS conference and new "Weeds" journal to society members.

Dr Mike Cripps

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and NZ representative to the APWSS**

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NEWS ITEMS

Action plan launched by CABI to manage *Parthenium* in Pakistan

(News item from Dr. A.N. Rao)

The Centre for Agriculture and Biosciences International (CABI) has launched a comprehensive *Parthenium Weed Management Action Plan*, aimed at managing *Parthenium*, a highly invasive weed species, prevalent and spreading in Pakistan. A two-day workshop was held in Pakistan from 8 October 2018 by CABI in collaboration of UK's Department for International Development (DFID) to share experiences on *Parthenium* weed's presence and impacts in Pakistan and draft an initial comprehensive action plan to manage *Parthenium* in short, medium and long term.

The Action Plan comprises of three stages: research, development and communication. It emphasizes on strengthening links between stakeholders to set priorities, list key activities and institutions involved. The focus will be on developing a Weed Management Decision Guide (WMDG) for utilizing best practices for early detection, prevention and management.

Commenting on this occasion, Dr Babar Bajwa, Regional Director of CABI CWA Pakistan, said:

"...Parthenium is a deadly weed that destroys crops and is also harmful to one's health. Along with farmers, it is essential that the general public be aware of the presence of this silent enemy living amongst them. We are confident that the CABI Action Plan to combat Parthenium will take great strides in helping prevent the growth and spreading of this weed..."

Planning and sincere implementation of such action plans are needed in each of the countries of Asian-Pacific region to effectively manage *Parthenium* and other major invasive weeds in the region.

Information source:

<https://www.dawn.com/news/1437722/action-plan-launched-to-raise-awareness-of-invasive-weed>



Photo: Participants of the workshop on *Parthenium* in Pakistan organized by CABI

(@CABI_Invasives https://twitter.com/CABI_Invasives/status/1049237115517722625)

Research Notes

Wild oat (*Avena sterilis* ssp. *ludoviciana*): Mechanisms behind its invasiveness in the northern grain region of Australia

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The northern grain region (NGR) of Australia is made up of three main cropping zones i.e. central and southern Queensland and northern New South Wales. Wheat (*Triticum aestivum* L.) is the main winter crop of this region that has been cultivated following conservation agriculture (CA) principles i.e. no-till or minimum till coupled with stubble retention. However, due to a reduction in tillage operations CA adopters are facing several challenges, with weed control considered one of the most challenging. Weeds, such as wild oat (mainly *Avena sterilis* ssp. *ludoviciana*) have a variety of survival mechanisms (for example, long-term, variable seed dormancy) that make it most difficult-to-control winter weed in this system of cropping.

Environmental stresses, such as drought and heat stress, are known to affect the seed dormancy status. The increasing frequency of hot and dry periods during the late winter/early spring season in the NGR might be responsible for producing less dormant seeds that mature and shed early before the wheat crop harvested. The no-till conservation cropping further help to retain these seeds on the topsoil. Under favourable germination conditions in the following season these less dormant seeds will immediately be available to re-infest the autumn/winter-sown wheat crop.

To examine this possible mechanism of persistence, two experiments (heat stress and soil water stress) were conducted in the glasshouse and glasshouse using wild oat biotypes collected from northern and southern areas of the NGR.

For the heat stress experiment, a portion of the plants were transferred from an ambient temperature greenhouse (23/14°C day/night) to a high temperature glasshouse (29/23°C) at the time of panicle initiation where they remained until harvest. The process of moving plants was repeated on three further occasions, each ten days apart. For the water stress experiment, five levels of soil moisture (100, 80, 60, 40 and 20% of soil water holding capacity) were applied after panicle initiation stage that continued until harvest.

Our research showed that both heat stress and soil water stress resulted in lower number of early maturing less dormant smaller seeds.



Fig. 1 shows the biotypes from north NGR (two left plants) matured earlier compared to those from south NGR by a heat stress treatment

The northern biotypes matured five to eight days earlier than southern biotypes in both experiments. This might be because northern biotypes have become adapted to higher seasonal temperatures and dry conditions in the northern NGR. The thermogradient-bar study showed that 99-96% of primary seeds of the control plants of all biotypes were dormant compared with 70-62% of those that matured earlier than the control plants, a significant difference of 34-29% less dormancy in both heat and water stress experiment.

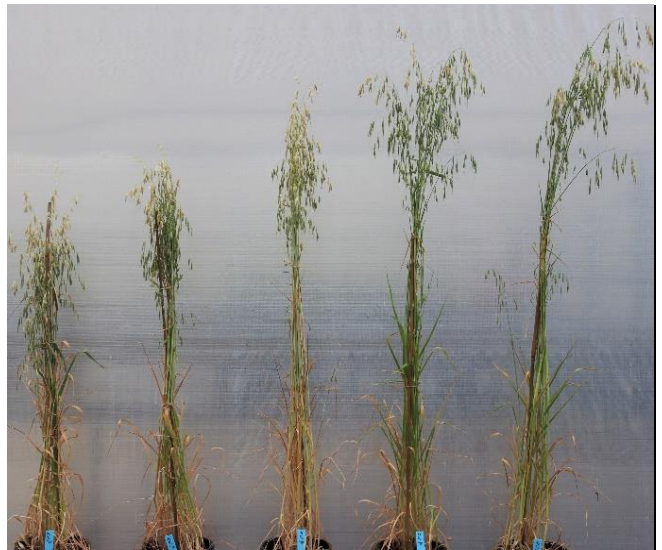


Fig. 2 shows the plants within a biotype matured earlier by the extreme water stress treatments (plants from left side) than the control treatment (plants at the right side)

Thus, the hot and dry periods that are frequently happening in the northern grain region of Australia at the time of seed development stage is responsible for production of less dormant smaller seeds and these fresh seeds are set to germinate and re-infest the crop in the next season. This mechanism of early shedding less dormant seeds may be contributing to wild oat persistence in the NGR under conservation agriculture.

Presented at the 3rd International Conference on Biological Invasions and Global Change, held in Kaifeng, China, 4-8 November 2018.

Parthenium weed and climate change: The effect of CO₂ on weed growth, reproduction and management

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Rapid climate change has brought multiple challenges to the ecosystem, including habitat expansion for adaptive, invasive plants. In particular, the effect of rising CO₂ has been recognized to have great impact on plant invasion by preferring growth of weeds instead of native and crop species. As one of the most notorious weeds, parthenium weed (*Parthenium hysterophorus* L.) has invaded over 40 countries and territories through competitive growth, allelopathy, prolific seed production and fast spread. Multiple studies have been conducted through two decades on these growth and reproduction traits in elevated CO₂ environment.

Strong positive effects are found on parthenium weed growth traits, such as biomass, height, stem diameter, number and length of branches and leaves; such effects are more pronounced in certain biotype. These enhancement are ascribed to increased photosynthesis, reduced transpiration rate and water use efficiency. These also enable leaves to produce more carbohydrate with less water usage, which also facilitates the weed to cope well with drought. Furthermore, substantial increase was found in seed production, together with morphological changes and higher proportion of delayed germination.

In management, two control agent winter rust (*Puccinia abrupta* Diet. & Holw. var. *partheniicola* (Jackson) Parmelee) and stem galling moth (*Epiblema strenuana* (Walker)) were found to be more effective under elevated CO₂ concentration. In contrast, parthenium weed is more aggressive in competition against suppressive plants, potentially replacing certain C4 grass species in the future under elevated CO₂ concentration.

In summary, parthenium weed will grow more vigorously in the future and more likely to spread, specific management regulation is needed for better control of this weed.

Research continues on the efficacy of glyphosate into the future

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Changes in weed pressure associated with climate change, whether through increased temperatures, rainfall shifts or elevated [CO₂], is a significant threat to crop production. In the wake of climate change, changes in weed biology, ecology, and interference potential may result in more complex crop-weed interactions that initiate alternative adaptive mechanisms.

As a general perception, it is thought that climate change will result in differential growth between crops and weeds, with weed species becoming more competitive due to their more diverse gene pool and physiological plasticity. These changes in vegetative and reproductive growth in response to climatic variables are expected to reduce the efficacy of certain commonly used herbicides, although the precise mechanisms behind this increased tolerance in weed species remains unknown.



UQ's Weed Physiologist Professor Steve Adkins, Spray Drift specialist Dr Chris O'Donnell, Crop Agronomist Dr Alwyn Williams, and Ph.D. Student Arslan Masood Peerzada comprise a SAFS UQ team exploring the impact of changing climate conditions on chemical weed management, and particularly the efficacy of glyphosate. The team's research is progressing under the assumption that glyphosate efficacy will decrease under conditions of reduced soil moisture, increased temperature, and elevated atmospheric [CO₂]. Under such conditions, lower rates of plant uptake and translocation of glyphosate are predicted to occur and thereby, reduce glyphosate-induced weed mortality, at least in certain weed species.

In our findings, glyphosate efficacy has been shown to reduce when windmill-grass (*Chloris truncata* R.Br.) is grown under a combination of increased temperature and reduced soil moisture. Changes in plant morpho-physiology and anatomy, such as decreased stomatal conductance and increased leaf thickness, might reduce foliar uptake of glyphosate. Then, possibly due to a dilution effect, glyphosate translocation to the root system is reduced. Similarly, glyphosate activity seems to be slower under elevated [CO₂] in controlling common sowthistle (*Sonchus oleraceus* L.), and Flaxleaf fleabane (*Conyza bonariensis* Cronq.) due to increased photosynthesis and reduced stomatal conductance as compared to ambient [CO₂].

Over the last 40 years, glyphosate has played a critical role in transforming Australian crop production systems and is presently the active ingredient in about 500 products. From the predominant pre-sowing knockdown herbicide, glyphosate is now used as a post-emergent herbicide in glyphosate-tolerant crops, in fallows, and for crop topping. However, the early economic savings experienced by using glyphosate are now being eroded due to the evolution of glyphosate-tolerant and resistant weed biotypes. Therefore, understanding the effects of climate change variables on weed growth and glyphosate activity is important for the optimization of herbicide applications for effective weed control in the future. With this aim, the SAFS UQ research group is now investigating strategies to help mitigate the adverse effects of climate change on glyphosate efficacy, including improved application technologies.

The findings will provide critical data to support grower decision-making regarding when and how to use glyphosate under predicted future climate conditions.

Editor's Pick's

Given below are some articles and newsworthy items that I've used my prerogative to put in the Newsletter for others to benefit from. They are very much related to Weed Science and other areas of Science which are of interest to us.

Nature Scientific Reports, 9: 1-13

Source:

<https://www.nature.com/articles/s41598-019-43361-w.pdf>

(published on 9 May 2019)

Direct and Indirect Effects of Herbicides on Insect Herbivores in Rice, *Oryza sativa*

Emily C. Kraus & Michael J. Stout

Densities of insect pests in agricultural communities may be affected by herbicides commonly used for weed management, via several routes. First, herbicides may cause direct mortality to insects present both during and immediately following application. Second, herbicides may induce plant defenses that increase resistance to insect herbivores. Third, herbicides may alter the quantity and composition of weed populations, which in turn may change the structure of insect communities found subsequently in the crop.

This study was designed to investigate the effects of an array of herbicides on the densities of several major pests found in rice in the southern United States. These pests included the rice water weevil, *Lissorhoptrus oryzophilus* Kuschel (Coleoptera: Curculionidae), the rice stinkbug, *Oebalus pugnax* (Fabricius) (Hemiptera: Pentatomidae), and a stemborer complex comprised of three lepidopteran species (Lepidoptera: Crambidae). Insects directly exposed to herbicides experienced high mortality; while those fed leaf material that had been exposed to herbicides did not.

Herbicide applications did not significantly increase resistance in rice to subsequent herbivore infestation. Results provided modest support for the third hypothesis represented by positive correlations between weed densities and insect pest densities.

Embrace teams large and small to foster the health of research

Source:

Nature Editorial (published on 13 Feb 2019)

https://www.nature.com/articles/d41586-019-00558-3?utm_source=Nature+Briefing&utm_campaign=998ec9a3a5-briefing-dy-20190215&utm_medium=email&utm_term=0_c9dfd39373-998ec9a3a5-43603665

Small teams might be more likely to produce 'disruptive research', but science needs a wide range of group sizes to truly flourish. Modern science is big, and author lists are growing. The celebrated 2015 paper estimating the Higgs boson's mass had a [record-breaking 5,154 authors](#). And the [number of papers with more than 1,000 authors has surged](#).

At the other end of the scale, single-author papers are scarce — almost non-existent in some fields. In an ecology journal, for instance, they dropped from 60% of publications in the 1960s, to just 4% over the past decade ([J. Barlow et al. J. Appl. Ecol. 55, 1–4; 2018](#)). And the [average number of authors per paper](#) rose from 3.8 in 2007 to 4.5 in 2011.

There are many reasons underlying the shift, including the enormous growth of the scientific community and the increasing amount of evidence presented in a single paper. But what are the consequences? Is the nature of research changing as larger teams are doing the work?

The authors of a paper in *Nature* this week tried to find out, by examining the "disruptiveness" of papers published over the past half a century (L. Wu et al. *Nature* <https://doi.org/10.1038/s41586-019-0941-9>; 2019). They measured the disruptiveness of a paper by looking closely at the citations it accrues: an article was considered to have posed a new idea, as opposed to solving or elaborating on existing questions, when the papers that cite it did not also cite many of its references.

The researchers found that, by this metric, teams containing fewer than five people tend to produce more disruptive work, whereas larger teams generate more incremental or consolidatory work. This held true for papers, patents and code, and across fields and time. This makes sense — large teams can marshal technical expertise and resources to tackle well-defined problems, but might be less likely to conceive unconventional ideas or be nimble enough to pursue them.

The effect appears to arise as a result of team dynamics, rather than through qualitative differences between individuals in different-sized teams. The authors showed that the same person tends to produce more disruptive work when working in smaller teams than in larger ones. So, is research becoming more mundane as the teams grow? Are genuinely new ideas being squelched by group-think? That seems unlikely: scientific advance comes in many forms, and research needs both disruption and consolidation, from small teams and large. The future health of the research ecosystem depends on a diverse range of team sizes. Research funders and policymakers should take note.

Editor's Note:

The following is a News Release from the Weed Science Society of America (WSSA).

FIGHTING BACK AGAINST PIGWEED

WSSA highlights successful awareness initiative & best practices (April 29, 2019)

Waterhemp and Palmer amaranth, both members of the pigweed family, have become significant threats to crop yields and farm incomes across the Americas. In the U.S., they compete with crops in the South and in parts of the Midwest. But according to the WSSA, a new community-based awareness initiative is informing growers about the risks and teaching them how to fight back.

Weed Scientists with The Ohio State University have worked with the United Soybean Board and the Ohio Soybean Council to launch a "**No Pigweed Left Behind**" campaign in their State, where problematic pigweeds (*Amaranthus* species) have been spotted in multiple counties.

"...Our goal is to hold the line against pigweed and avoid large-scale infestations..." says Mark Loux, Ph.D., of The Ohio State University. "...We want growers to understand they can't beat these weeds with herbicides alone..." What makes pigweed (especially Palmer amaranth and water hemp) so problematic? A single female plant will often produce hundreds of thousands of small seeds. The weed grows rapidly – as much as three inches a day under ideal conditions. That's a problem since most post-emergence herbicides must be applied when the plants are *less than three inches tall*. To add to the complexity, pigweed plants can rapidly develop resistance to multiple herbicides.

The "No Pigweed Left Behind" campaign is designed to raise grower awareness and to provide specific tips and techniques for controlling the weed before it goes to seed. For years Loux and his colleagues have shared information on pigweed with crop advisors, but they wanted to raise visibility and broaden their reach. Now catchy and colourful "**No Pigweed Left Behind**" materials are being used to call attention to their cause.



Pigweed Best Practices

So how do you battle pigweed if herbicides alone aren't enough? The following are best practices:

1. Know what pigweed looks like. There are a number of pigweed species with varying leaf shapes and characteristics, so it's important to study up. This handy fact sheet can help you identify members of the pigweed family, including Palmer amaranth, waterhemp, spiny amaranth, smooth pigweed and redroot pigweed.

2. Be careful of cross-contamination. If you purchase or lease equipment, know where it has been. Avoid combines, plows and custom harvesting equipment used in areas known to harbor pigweed. Avoid cotton feed products or hay that might contain pigweed, as well as manure from animals fed with cotton feed products.

3. Scout for pigweed. Inspect fields continually throughout the growing season for pigweeds that might have escaped herbicide applications. Pay special attention to recently seeded cover crops, Conservation Reserve Enhancement Program (CREP) plots, field buffers, roadsides and natural areas where problem pigweeds might be lurking.

4. Be smart about herbicide selection. Use residual herbicides to control early-emerging pigweed, but mix things up instead of relying on a single herbicidal site of action. Herbicide applications that include multiple sites of action still effective on the targeted pigweed population can slow the development of resistance.

5. Avoid seed dispersal during harvest. If you spot patches of pigweed as crops are being harvested, make certain to avoid them. Running a combine over pigweed can disperse seeds and prove problematic for years to come.

6. Use safe removal techniques. If you spot pigweed plants that have yet to produce mature seeds, pull them or cut them off just below the soil line. Plants with mature seeds should be bagged before being removed and destroyed. Either burn the plants or bury them under at least a foot of compost.

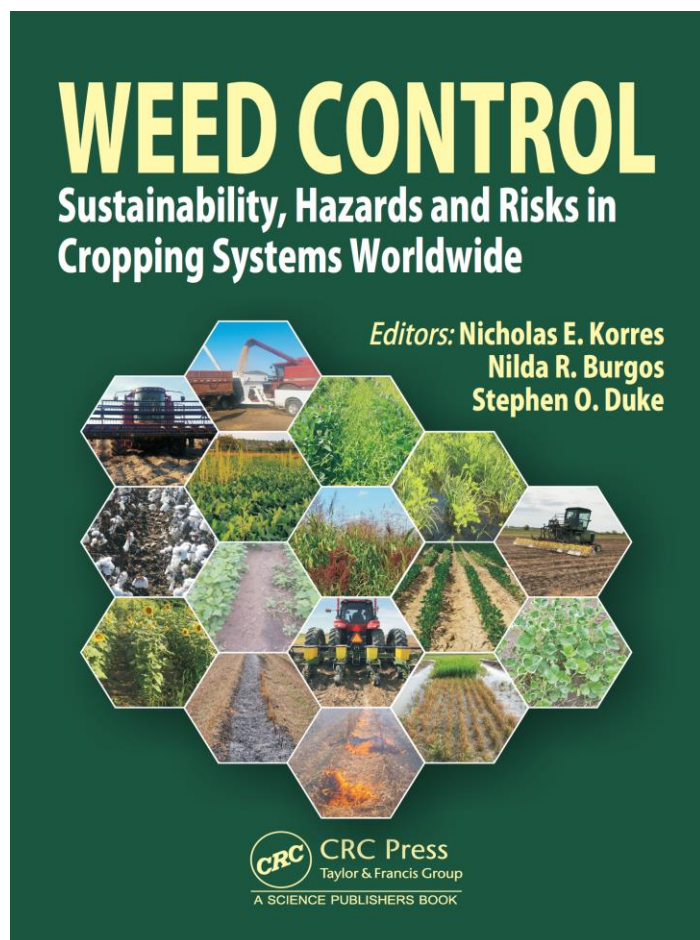
WSSA Press Contact: Dr. Lee Van Wychen, Executive Director of Science Policy, Lee.VanWychen@wssa.net

A NEW BOOK ON WEED MANAGEMENT

There is now a new Weed Control book available from CRC Press, Boca Raton, USA (see image, overleaf). The Editors include Dr. Nilda Burgos and Dr. Stephen Duke, who are closely associated with APWSS. There are 34 Chapters and Chapter authors include some members of APWSS.

We congratulate our colleagues for producing such a book and making a significant contribution to the progress of our Science. The 664-page book is priced at: US \$ 307 (Hard copy) and US \$ 69.91 (eBook). Visit the Website:

<https://www.crcpress.com/Weed-Control-Sustainability-Hazards-and-Risks-in-Cropping-Systems-Worldwide/Korres-Burgos-Duke/p/book/9781498787468>



The following is an excerpt from the book promotion:

Concerns about sustainable food production systems along with the evolution of herbicide-resistant weeds necessitate a review of current weed control strategies. Sustainable weed control requires an integrated approach based on knowledge of each crop and the weeds that threaten it. Important topics of weed science related to sustainable issues, potential hazards, and risks are thoroughly discussed in the first part of the book. The effects of herbicides and weed control methods on soil, freshwater ecosystems and insects are critically reviewed.

Occupational hazards due to non-judicious use of herbicides along with occupational hygiene practices for using herbicides such as use of personal protective equipment, spillage management herbicide storage, drift avoidance are discussed in detail. The potential use, types, advantages and disadvantages of bioherbicides and allelopathy for sustainable weed control and research needs are explored in depth. Important issues of herbicide resistance evolution, distribution

in major crops, and the contribution of genetically engineered herbicide tolerant crops on sustainable weed management are examined thoroughly.

The second part of the book discusses weed control in cereals, row crops, cash crops, plantations, orchards and vineyards and root crops in terms of mechanical, physical, cultural, preventive and chemical weed control. The evaluation of weed control sustainability for each crop is also discussed. Under miscellaneous cropping systems, the use of aromatic plants and essential oils for sustainable weed control along with weed control in grassland and organic farming systems are examined.

This book is an invaluable source of information for students, scholars, growers, consultants and other stakeholders dealing with agronomic-, horticultural-, plantation-, and grassland-based production systems. It amalgamates and discusses the most appropriate, judicious and suitable weed control strategies for a wide range of crops.

GLYPHOSATE IS VERY MUCH IN THE NEWS

Editor's Note:

Glyphosate is very much in the News these days. Given below is the Abstract of a useful review article, from 2016 (fascinating reading) and recent news updates, for the benefit of our readers.

The following article can be downloaded from a Springer Open Journal ***Environmental Science Europe (2016), 28:3.***

Trends in glyphosate herbicide use in the United States and globally

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Abstract

Background: Accurate pesticide use data are essential when studying the environmental and public health impacts of pesticide use. Since the mid-1990s, significant changes have occurred in when and how glyphosate herbicides are applied, and there has been a dramatic increase in the total volume applied.

Methods: Data on glyphosate applications were collected from multiple sources and integrated into a dataset spanning agricultural, non-agricultural, and total glyphosate use from 1974–2014 in the United States, and from 1994–2014 globally.

Results: Since 1974 in the U.S., over 1.6 billion kilograms of glyphosate active ingredient have been applied, or 19% of estimated global use of glyphosate (8.6 billion kilograms). Globally, glyphosate use has risen almost 15-fold since so-called "Roundup Ready," genetically engineered glyphosate-tolerant crops were introduced in 1996.

Two-thirds of the total volume of glyphosate applied in the U.S. from 1974 to 2014 has been sprayed in just the last 10 years. The corresponding share globally is 72%.

In 2014, farmers sprayed enough glyphosate to apply ~1.0 kg/ha (0.8 pound/acre) on every hectare of U.S.-cultivated cropland and nearly 0.53 kg/ha (0.47 pounds/acre) on all cropland worldwide.

Conclusions: Genetically engineered herbicide-tolerant crops now account for about 56% of global glyphosate use. In the U.S., no pesticide has come remotely close to such intensive and widespread use. This is likely the case globally, but published global pesticide use data are sparse.

Glyphosate will likely remain the most widely applied pesticide worldwide for years to come, and interest will grow in quantifying ecological and human health impacts. Accurate, accessible time-series data on glyphosate use will accelerate research progress.



News Story from ABC, Australia

Monsanto ordered to pay \$2 billion to couple who say they contracted cancer after using the weedkiller Roundup

Source:

<https://www.abc.net.au/news/rural/2019-05-14/monsanto-loses-third-verdict-over-weedkiller-roundup/11111034>

A Californian jury has ordered chemical giant Monsanto to pay US\$2 billion (\$2.8b) to a couple who say they contracted cancer after using the commonly used weedkiller, Roundup.

Key points:

- Alberta and Alva Pilliod used Roundup for more than 30 years and were both later diagnosed with cancer.
- Lawyers say there will be more cases against Monsanto.
- Monsanto's owner, Bayer, says the decision is "excessive and unjustifiable" and it will appeal.

It is the biggest payout against the company Monsanto over the commonly used weed-killer Roundup and the [third case they have lost](#).

Earlier this year, a United States jury found glyphosate-based weedkiller Roundup was a "substantial factor" in causing a man's cancer, the [second such court](#) ruling against the herbicide's makers in less than a year.

The plaintiffs, Alberta and Alva Pilliod, used Roundup for more than 30 years, and were both later diagnosed with non-Hodgkin's lymphoma. In a press conference after the verdict Mrs Pilliod thanked the jury.

"...We wish that Monsanto had warned us ahead of time about the dangers of using Monsanto [weedkiller]..." she said. "...And that there was something on the front of their label that said 'danger may cause cancer'..."

Other snippets of news...

The active ingredient in Monsanto's weedkiller Roundup is glyphosate, one of the world's most widely used herbicides that has become highly controversial because of claims of its links to cancer. A San Francisco court this week ordered Bayer-owned Monsanto to pay more than \$2 billion in damages to a couple who claimed the product caused their cancer, in the third such ruling since

August 2018. The World Health Organization's (WHO) International Agency for Research on Cancer found in 2015 that glyphosate is "probably carcinogenic", and there have been some attempts around the world to stop its use.

However, the US Environmental Protection Agency (EPA) said this month that the herbicide is unlikely to cause cancer in humans, although it recommended measures to prevent potential ecological risks.

Here is a broad overview of the state of play regarding glyphosate around the world.

- United States -

- The German pharmaceutical firm Bayer, which bought Monsanto last year, announced in April 2019 that over 13,000 lawsuits related to the weed killer had been launched in the United States.
- California, in July 2017, became the first US state to list glyphosate as carcinogenic, a measure that did not result in a state-wide ban but requires companies selling it to flag warnings.
- In August 2018, a California jury found Monsanto guilty of failing to warn a dying school groundskeeper that Roundup and its professional grade version RangerPro might cause cancer, saying they contributed "substantially" to his terminal illness.
- The lawsuit was the first to accuse the product of causing cancer and Monsanto was ordered to pay \$78.5 million in compensation.
- In March 2019, the company lost another case to an American retiree who blamed his cancer on the weedkiller and was ordered by a court to pay \$80 million.

- Europe -

- After two years of a fierce debate, the European Union member states decided at the end of 2017 to renew the licence for glyphosate for another five years. This was despite the objections of France and eight other member states.
- The EU's executive body, the European Commission, pointed to the approval of glyphosate by its two scientific agencies, the European Food Safety Authority (EFSA) and the European Chemicals Agency, which do not classify the substance as carcinogenic. But the independence of EFSA was questioned after

media reports suggested that pages of its report were copied and pasted from analyses in a 2012 Monsanto study.

The French government promised in May 2018 that glyphosate would be banned "for its main uses" by 2021, and "for all of its uses" within five years. In January 2019, French authorities banned the sale of Roundup Pro 360.

- Latin America -

- Colombia outlawed aerial spraying of glyphosate in 2015, but President Ivan Duque in March 2019 called for the ban to be modified in order to tackle record cocaine crops.
- In agriculture powerhouse Brazil, a major user of the weedkiller, in August 2018, suspended licenses for products containing glyphosate, pending a toxicological re-evaluation. Another court lifted the suspension the following month saying it was not justified.
- In some areas of Argentina there have been clashes between farmers for whom the product is indispensable, and residents concerned about their health, with some restrictions applied at a local level.
- El Salvador's parliament voted in 2013 to ban 53 agrochemical products, including those containing glyphosate. However, the ban was later lifted on 11 products — including the weedkiller.

- Asia -

- The Sri Lankan government banned glyphosate imports in October 2015 following a campaign over fears that the chemical causes chronic kidney disease. It backtracked in July 2018 but limited use to tea and rubber plantations.
- In March, Vietnam also decided to ban products containing glyphosate.

8TH INTERNATIONAL WEED SCIENCE CONGRESS (IWSC 2020)



The 8th International Weed Science Congress (IWSC 2020) is now being organized by the International Weed Science Society (IWSS) and the Weed Science Society of Thailand. This will be held at the Centara Grand Hotel at Central World in Bangkok during 22-26 June 2020. The main topics will include:

- Herbicide resistance
- Weed Biology and Ecology
- Integrated Weed Management
- Climate Change Aspects of Weed Science
- Non-Chemical Weed Control
- Application Technology
- Economic/Social Aspects of Weed Management
- Environmental Fate of Herbicides
- Weed Issues in Asia
- New Technology for Weed Management
- Weed 'Omics'

Anyone requiring additional information should contact **Dr. Chanya Maneechote** (chanyaku36@gmail.com)

28TH APWSS CONFERENCE, 2021

Thailand was awarded the honour of hosting the APWSS 2021 Conference. Dr. Chanya (now Vice-President of APWSS) is the primary local organizer of this event. The APWSS Conference will be held at the Imperial Hotel in Chiang Mai, the northern province of Thailand. The First Circular will be distributed to the APWSS members in 2019.

SOME WISE WORDS FROM AN EDITOR:

"...As an author I cannot think of a single time when the reviewers' comments have not improved the quality of the paper or report. So, when you get a critical review, see it as saving you from a more public mistake. When I review a paper, my goal is seeing the paper or report improve. Sometimes that means that more work may be needed either in the lab or on the manuscript. While this may be frustrating, my goal is not to inflict pain but to improve the quality of the paper..."

UPCOMING EVENTS

[19th Australian Agronomy Conference](#)

25 -29 Aug 2019; Venue: Wagga Wagga, NSW.

[20th NSW Biennial Weeds Conference](#)

26-29 August 2019; Venue: NEWCASTLE, NEW SOUTH WALES

[27th Asian-Pacific Weed Science Society Conference](#)

3 to 9 Sep 2019; Venue: Riverside Majestic Hotel, Kuching, Sarawak, Malaysia

[XIX International Plant Protection Congress - 2019](#)

Nov 10-14, 2019; Venue: Hyderabad, India

[8th International Weed Science Congress](#)

22-26 June 2020; Venue: Bangkok, Thailand

News Item

DR. A.N. RAO RECEIVED "RAITU NESTAM AWARD 2018"

Dr. A.N. Rao, the General Secretary of the APWSS and Consultant, IDC and IRRI, ICRISAT, was awarded "Raitu Nestam award 2018 (Scientist)" in October 2018. He received the award from Hon. Vice President of India, Shri. M. Venkayya Naidu. at Hyderabad. The Award was given by "Raithu Nestham and Muppavaram Foundation" at its Annual Awards function, held by the Swarna Bharati Trust, Hyderabad on 7 October 2018 (Photo 1).



Photo: 1. Dr. A.N. Rao, receiving the "Raitu Nestam award 2018 (Scientist)" from Hon. Vice President of India, Shri. M. Venkayya Naidu at Hyderabad

The award recognized Dr. A.N. Rao's 40 years of experience in the field of Agriculture with specialization in Weed Science, gained at International Rice Research Institute (IRRI), International Crops Research Institute for Semi Arid Tropics (ICRISAT), APAU and several other organizations. He has around 100 publications in national and international journals.

Dr. A.N. Rao worked closely with farmers in India, Egypt and Philippines and has authored several popular articles that are of use to farmers in addition to undertaking demonstrations in farmers fields on best

management practices (including weed management) of different crops.

Dr. A.N. Rao presented two APWSS published books, of which he is one of the Editors, to the Honourable Vice President of India, Shri. M. Venkayya Naidu, when they met at the Swarna Bharat Trust, Hyderabad.

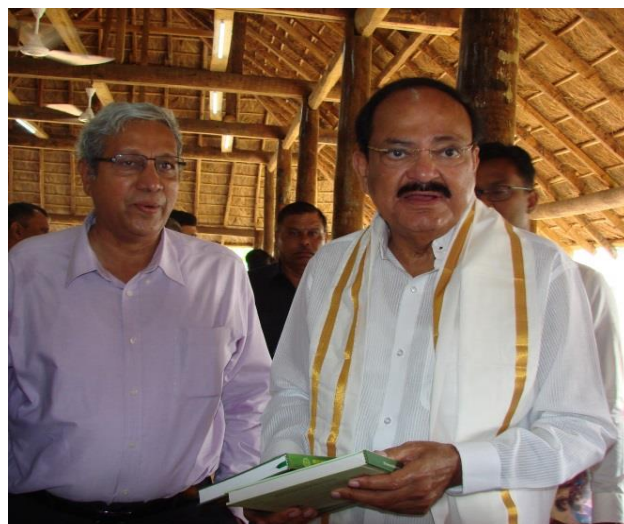


Photo 2: Dr. A.N. Rao sharing APWSS books with Honourable Vice President of India, Shri. M. Venkayya Naidu (Right)

Editor's Note:

For the benefit of Readers, I've summarized some key points from a recent article published in *Nature Research* on 9 Nov 2018.

Original Source:

<http://blogs.nature.com/houseofwisdom/2018/11/so-you-want-to-be-a-better-writer.html>

(This is a guest post by Lea Gagnon, an Editorial Development Advisor in *Nature Research*, Posted by [Mohammed Yahia](#))

So, You Want To Be A Better Writer

In the competitive academic and scientific landscape where no research is complete without publication, researchers are pressured to publish scientific articles. However, writing a paper in academic English presents many challenges, especially for non-native speakers. The following are three writing principles that good writers use to reach their readers better.

- 1) The first principle is called the **cognitive load theory** and refers to how much new information readers can process. Science is already complex. Scientists need to be concise and avoid unnecessary words. Therefore, short sentences of 10 to 20 words are better than long-winding sentences. Similarly, expressing one single idea per sentence ensures optimal understanding.

If you give too much information at once, you risk confusing and losing your readers. If you limit the information, and carefully select strong words to concisely express your idea, the reader is more likely to understand.

Although varying sentence length can make a text more dynamic and exciting, previous research¹ has shown that comprehension level increases when sentence length decreases. A 50-word long sentence allows only 50% comprehension, whereas 20- and 10-word long sentences raise it to 80% and 95%, respectively.

- 2) The second principle is **cognitive bias**, which describes the tendency for authors to assume that their readers know as much as they themselves do. Specialists should keep in mind who their audience is and put information within context to make it easier to be understood. For example, defining ideas and theories in the introduction increases clarity for newer researchers or those from outside the field.

Avoiding subjective (e.g. interestingly, surprisingly) and complex (e.g. "to ascertain" instead of "to test") words reduces ambiguity. Using more active voice (e.g. "I write a paper") instead of passive voice (e.g. "the paper was written by me") makes a text simpler, more engaging and easier to read.

- 3) The last principle refers to the **readers' expectations** – or the logical flow of information. Logically structuring a text involves introducing an idea, developing it and highlighting its importance. The topic position at the beginning of a sentence introduces an idea whereas the stress position at the end emphasizes its importance.

A logical flow can be maintained with the signposting technique that good communicators often use to guide their readers. Signposting consists of placing keywords in the **stress position** of the first sentence in order to introduce the *topic position*.

An examples is given below:

- a) "The *treatment efficacy* is promising, **but the side effects are serious.** *This treatment* will be used clinically **to fight the infection.**"
- b) "The *side effects* are serious, **but the treatment efficacy is promising.** *This treatment* will be used clinically **to fight the infection.**"

In this example, the second option uses signposting effectively and has a better logical flow between the two sentences than the first option. Signposting is also beneficial for linking paragraphs together, where key sentences at the beginning or the end of paragraphs replace keywords.

In conclusion, these three learning principles can be summarized into three reminders for researchers:

conciseness, clarity and logic.

By writing articles effectively this way, researchers can increase their chance of publication and their readers' comprehension.

References:

Miller G.A. & Selfridge J.A. (1950) The Journal of American Psychology 63(2):176-185.

Editor's Comments:

If you have any feedback, please do not hesitate to send those to:

Nimal.chandrasena@gmail.com

Editor, APWSS

26 May 2019