

Making a Difference- The New ‘Weeds’ Journal

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In this Editorial for the first issue of the new journal - *Weeds* - I reflect upon why the Asian-Pacific Weed Science Society (APWSS) decided to launch a journal and why we decided to make it **Open Access** (OA). A journal publication is usually the principal means of recording achievement in science. It is also the most efficient way for scientists to share information. All publications are important to professional societies as a means of sharing knowledge. Over the past five decades, APWSS achieved this objective, primarily through the proceedings of our biennial conferences.

Much has happened in Weed Science over the past five decades. Early APWSS conferences were well-known for introducing new herbicide chemistries, new formulations for different crops and discussions on topics, such as different methods of herbicide application, biological weed control, aquatic weed control and environmental impacts of herbicides. Those early conferences also emphasized the importance of education, extension services, international linkages, and collaborations. In recent times, APWSS Conferences have tackled emerging topics, such as herbicide resistance in weeds, effects of climate change on weeds, potential utilization of weeds as biological resources, sustainable farming, and weed risk assessments. Throughout the Society's history, there has also been an emphasis on educating the affiliated members to influence policies in their own countries, and more broadly, across the region (Chandrasena and Rao, 2017).

Over five decades, APWSS Conference Proceedings have had varying degrees of refereeing, which usually reflect the editorial skills of the host country's committees. Despite some qualitative variations, overall, the proceedings have supported the APWSS ethos of '*learning from each other*'. They have also fostered alliances across member countries to manage weeds better, as envisioned by our founders (see Furtick, 1969).

Publishing a journal, in addition to the biennial conference proceedings, is a significant step forward for the APWSS, as it will boost the public face of the Society. A journal paper typically undergoes a more rigorous peer-review process, than that required for conference communications. This enhanced scrutiny should make a journal paper more authoritative and a better source for citation. Additionally, the publication of a journal should boost the reputation and the regional standing of the APWSS.

In a reputation-based profession, such as scientific research, the importance of publications cannot be overstated. Research that is never published is of little or no value to society. Publishing is almost obligatory to achieve progress in modern science. The publication of a journal paper enables authors to gain acknowledgment from their peers as specialists in their specific research area. Publications in a peer-reviewed journal also give international recognition not just for an individual, but also to an institution. In some cases, where a topic of primary global importance is critically analysed, and reviewed in a publication, the authors' country, or even the region, may also get credit and greater recognition.

Not just another paper!

The 1950's and 1960's saw the emergence of a '*publish or perish*' culture (i.e., publish your research or lose your career). For academics and scholars, this phrase was a constant and often threatening reminder of the importance of publication (Roberts, 1991; Moosa, 2018). During this period, across the world, the number of academic and scientific institutions increased dramatically, stimulating an expansion of research agenda. Scholars with a high frequency of peer reviewed publication attracted attention to themselves and their institutions, which usually ensured the individual's career progress and also more funding for the institution.

The heightened emphasis on publishing and consequent fierce competition for research funding has had deleterious effects, such as poor collaboration between individual researchers and research entities. It also decreased the value of scholarship as scholars spent more time scrambling to publish, rather than dedicate time to developing important research themes that deliver good science for the public. Despite these negative aspects, the quality of journal papers in the latter part of the 20th Century was demonstrably high, not just in Weed Science but in all disciplines. This enhanced quality resulted directly from tighter editorial oversight, combined with tougher peer-review processes by journals. However, the new millennium has seen a proliferation of sub-standard journals, which allow publishers to profit from science communications.

Weeds will avoid adding to the wasteful dump of low-quality papers on weed-related topics, by maintaining publication excellence through the quality control processes, typically associated with legitimate journals. Using experts and experienced reviewers, *Weeds* will be transparent and rigorous in the peer-review process. Instead of publishing for its own sake, *Weeds* will demand contributions that will be valued by scholars interested in Weed Science. The journal hopes to receive, evaluate, and publish not just any paper, but meaningful contributions that will advance the global dialogue on weeds. If managed well, this approach will make the APWSS more influential in the region and within Weed Science.

Mentoring authors to write well

The publication ethos of *Weeds* also extends to helping scientists to write highly readable papers, which are unambiguous, concise and scientifically accurate. In this way, papers published in *Weeds* will be valued by other scientists and are more likely to be cited by them, advancing the broader discipline of Weed Science. It will also enable the journal to attract worthy contributions from the broader community of weed scientists.

Weeds may also be an avenue to improve scientific communications on weeds in our region. Whether we like it or not, English is the primary mode of communication for international commerce and science, primarily because the technologies we rely on today are mostly English-based (e.g., more than 50% of internet websites). Moreover, a quarter of the world's population speaks English. Therefore, there is an onus on scientists in the Asian-Pacific region to obtain a high level of competency in English so that

they may benefit from greater recognition of their work. Despite this obvious truth, natives of non-English speaking countries in our region often do not write well in English. "*English is not our native language*" is an excuse that is frequently heard in this discourse.

Although poor English writing may not result in outright rejection of a manuscript, it may well negatively influence the overall impression of the work on the part of peer reviewers and editors alike (Kelly et al., 2014). With scientific writing, as with most other forms of communication, the most direct statement of the intended message is always best. In other words, an author should say what he or she means, without using convoluted arguments.

Weeds requires the Editors to primarily assess the *scientific value* and scholarship of each manuscript submitted. Beyond this, the Editors undertake to help authors improve the structure and grammar of their manuscripts, committing to a mentoring role. Authors can also improve the quality of their papers by addressing referee questions conscientiously. Peer-reviewers use an independent and critical eye to question the scientific validity of the authors' arguments and to assess the value of the contribution from a readers perspective. Ideally, our editors will dissuade authors from succumbing to the relentless pressure to publish at all costs to increase the number of publications, and instead to publish high quality, readable papers.

Time-tested scientific approaches

Cohen (1985) reasoned that '*science is the only cumulative and progressive*' activity of humankind. Typically, scientific advances are incremental and cumulative, in which one small step follows another, building upon existing knowledge. Science is also an intellectual and creative exercise, which begins with open-minded observations and questions, seeking to end with evidence-based answers.

A simple compilation of information will not advance Science, which requires logical, methodical, and critical analysis of data, observations, and assumptions. In advancing knowledge about weeds and how to effectively manage them, our journal will expect all contributors to follow established scientific traditions. *Weeds* will recognize 'good science,' and by extension, good scientific papers, which are based on the strength of evidence obtained through repeated experiments and observations.

The scientific research process, typically, is an iterative, cyclical procedure through which information is continually reviewed and revised. In one way or another, the process involves the following elements:

- The collection and analysis of new or previously existing data for evidence-based conclusions.
- Developing a concept, or theory, as a hypothesis, followed by testing to support it.
- The generation of new ideas and theories through experiments, analysis or new observations, leading to the emergence of a new agenda.
- Applying new technologies, for better precision in measurements, and new methods of data analyses for stronger discrimination of results.
- Refinement of results through replication and extension of the original work, verified by independent review.
- Timely communication of ideas to others and dissemination of knowledge through publication.

Scepticism, openness, sharing, and disclosure are typically associated with the scientific inquiry process. These not only provide the means of identifying theoretical or experimental errors that occur inevitably in science but also imply an obligation to maintain the integrity of the research process. Errors are often corrected by subsequent research or re-examining the data with new analysis, which may lead to better explanations of the results. Scepticism of other scientists, including the referees and editors, is an essential part of the thoughtful examination that all contributions must undergo.

Editors of any scientific journal are 'gate-keepers', responsible for safeguarding established scientific traditions in communications. The Editors of *Weeds* will be committed to maintaining these traditions. They will also uphold ethical principles that every scientist should adhere to, including intellectual honesty, which must be demonstrable at all stages of any scientific work - from developing a hypothesis, through to the investigative research methodology, data analysis, and interpretation. Honesty is a keystone in writing effective communications, worthy of being published.

The Value of a Paper

The paramount issue for *Weeds* is the 'value' of any contribution to the discipline of Weed Science or its various sub-disciplines. Some scholars argue that the value of a paper depends upon the reader's interest, perspectives, and background, which have subjective

elements (Pandit and Yentis, 2005). However, there are essential elements of a paper, which should merit its publication. These include its originality, critical appraisal, and strength of evidence; e.g., the logic of argument; the soundness of the methods used and the rigour of the statistical testing, where appropriate. If these elements are present in a paper, it should then lead to drawing well-informed credible conclusions, informed by the current knowledge.

Ideally, a paper deserving of publication should also influence '*the way we think*' about a particular topic. Really good, or outstanding papers, would present findings and arguments that may eventually become genuinely valued by others who are interested in the same subject matter. Sometimes, such papers may also kindle new interest in scholars on topics that may not have been of great interest to them, up to that time.

When evaluating a paper, a referee will ask: '*Are there any other possible explanations for these results? Which specific questions concerning this topic will increase the current knowledge we have? How useful are the results? What are the implications of the findings?*' The challenge is for researchers to ask the *right questions*, so they get the right answers.

These days, one comes across plenty of papers, which sacrifice quality for quantity. In some of the lowest quality papers, published mostly in dubious journals, there is often a gap between the conclusions and the primary aims of the inquiry. There are also countless examples of papers, which use a catchy title to attract readers. However, closer scrutiny reveals that the title has little to do with the content of the paper. Often, such papers contain only benign and superficial conclusions with no meaningful discussion.

Weeds will foster a culture of truth-seeking, promoting systematic scientific inquiries and persuasive communications. Each submission to *Weeds* will undergo a rigorous peer-review examination by two or more independent and expert reviewers. The review will be more than simple circling of typographical mistakes. Reviewers may challenge the authors' assumptions and conclusions.

When an article is published, authors could feel confident that reviewers who are knowledgeable about a particular topic have applied a collective judgment as to whether a paper contributes something worthy of publication. Taking a stand to move away from a quantity-driven publishing model to a quality-driven one, *Weeds* will discourage the production of papers just for the sake of a paper.

As a responsible journal, *Weeds* recognizes the value of review papers, which appraise a body of knowledge and articulate the current status of the topic. Good reviews are widely cited, as accomplished scholarship. However, while some articles bill themselves as critical reviews, this is rarely the reality. The over-abundance of reviews we encounter nowadays is a direct outcome of the impact factor metric (Peter Suber, *personal communication*, Aug 2019). Review articles are more highly cited than ordinary research articles, and therefore, boost the impact factors of journals. To be accepted by *Weeds*, a review must do more than just present chronological accounts of any inquiries, findings, data, and information. *Weeds* will encourage contributors to review papers to meaningfully analyze the topic and provide evidence to validate any new findings.

There is also a recent negative trend to produce a review of a convenient topic, although the authors themselves have no demonstrable track record on the subject reviewed. This phenomenon is not a problem if the review is a defensible analysis of data and information from which valid conclusions may arise. However, authors who lack experience in a specific topic can fail to appraise the subject critically, and unquestioningly accept the literature covered. Instead of examining the empirical research, many reviews just group research studies in various shapes and forms and re-cast their main findings, with non-committal conclusions. Such reviews do little to advance scientific knowledge about managing weeds. *Weeds* will insist on a fundamental requirement of scholarly integrity - that if a piece of work is a critical examination or analysis, it has to live up to that billing.

Weeds will also attempt to dissuade authors from two other potentially detrimental practices, which are intertwined with the 'publish or perish' culture. Prevalent in journals nowadays, the first is 'salami-slicing,' whereby authors split the same research into the smallest possible publishable units, in a bid to enhance productivity (Beaufils. and Karlsson, 2013). Many such papers do not explain why splitting was necessary. In some countries, academics are rewarded for such doubtful productivity, possibly, receiving extra payments for each of the papers they publish. Some researchers may argue that their research findings and data are too much for a single article and that splitting the work into several papers works better. Sometimes, splitting to produce sequential papers, possibly indicated as a series, maybe acceptable to *Weeds* but only with justification.

The second dubious practice is duplicate publication in which researchers publish the same material in different journals with different keywords,

captions and co-author variations (i.e., merely changing the order of authors' names) on each occasion. *Weeds* will consider these unethical practices a blight on scientific publishing integrity.

Science behind a paywall?

Most people know that the Internet was created to help scientists share their research efficiently. The question then is – *why are journal fees increasing when the Internet has made sharing information cheaper and more accessible than ever before?* *Weeds* believes that it is a responsibility of any journal to help scientists take full advantage of the Internet's original purpose and power, to communicate information efficiently and seek ways to collaborate and advance the cause of science.

Over the past two decades, 'paywalls' imposed by publishing companies have become a controversial issue for scientists, who want to publish their research in respected journals. The paywall model is a subscription model, which charges a fee for access to a published paper. Historically, since the 17th Century, modern science thrived because scientists of the day were proud to publish their research and share the joy of their discoveries with the world (Kumar, 2009; Kelly et al, 2014). In those days, knowledge-sharing was achieved through personal journals and books, published with the patronage of wealthy individuals, or through the sponsorship of academic institutions, governments, or professional societies (see Wikipedia, undated).

Until recent times, journals charged authors a nominal fee to cover hard-copy printing, only after accepting a paper for publication. This fee is referred to as the Article Processing Charge (APC). Until the late-1980s, it was quite common for scientists in developing countries to receive an exemption from journal page charges by simply writing to the editor. Nowadays, the world's most prestigious journals have been taken over by global publishing companies, who have to cover all costs and still derive a profit for their investors. This takeover has resulted in the commodification of scientific communications. Investors have discovered that publishing scientific knowledge is a new opportunity to make money. Profit is the singular motivation for the paywalls. Lost in the publishing industry's drive for profit is the brilliance of an inventor or the efforts of a dedicated researcher.

Subscription fees *limit* access to scientific knowledge (Khabisa et al., 2014; Moosa, 2018). For a scientist in a developing country, the consequences of facing a paywall can be utterly dis-empowering. If a

scientist is unable to access the full text of an article of interest, then he or she may lack information important for anchoring their study, make improved decisions about experimental designs, or correctly interpret results. Mainly, they will be poorer for the lack of access to information, simply because they cannot afford to pay for it.

Despite the negative side of the paywalls, some journals defend fees stating that the primary aim of fees is to put a *value* on the exclusive content they produce. These journals claim they maintain the quality of published research and make it more understandable and convenient for readers using paid editors, even though they do not pay authors or reviewers. The claim is that science operates more efficiently when new research can be accessed *freely and immediately* by scientists around the world, and 'data-mined' by powerful web-crawling technology that may identify inter-connections that individuals would be unlikely to make otherwise.

Most paywalled journals employ skilled editors, who are not necessarily scientists. They are paid to ensure accuracy, consistency, and clarity in scientific communications. These paid professionals pre-vet papers before peer-review, with the justification that they support the review panels. They also select engaging content to present exciting discoveries, provide catchy titles, and get into marketing through related blog posts. Some publishing staff, working for modest stipends, also undertake the complex typesetting, printing and distribution activities, including Web publishing and hosting. These costs justify hefty access fees.

While this debate will most likely rage longer, various digital technologies and the fast Internet, have all made *open access* to research papers and journals relatively easy. For those who are interested, it is instructive to read Peter Suber's treatise on **Open Access** (Suber, 2012), which discusses both sides of the argument, including strengths and weaknesses. Examining the issue in great detail, Suber stated:

"...Shifting from ink on paper to digital text suddenly allows us to make perfect copies of our work. Shifting from isolated computers to a globe-spanning network of connected computers suddenly allows us to share perfect copies of our work with a worldwide audience at essentially no cost. About thirty years ago this kind of free global sharing became something new under the sun. Before that, it would have sounded like a quixotic dream. Digital technologies have created more than

one revolution. Let's call this one the access revolution..."

"...The deeper problem is that we donate time, labor, and public money to create new knowledge and then hand control over the results to businesses that believe, correctly or incorrectly, that their revenue and survival depend on limiting access to that knowledge..."
Peter Suber (2012)

Our Journal

In these changing times for academic publishing, APWSS ambitiously took a stand to create a journal that does not charge hefty publication fees, as an initiative to support scientific communications on weeds. The intention of *Weeds* is for an Editorial Board of reputed and experienced scientists to volunteer their time freely, to produce a journal that makes a difference to other scientists' lives. Significant recent advances in computing technology, software and Internet tools enable the cost-effective production of an on-line journal to benefit our community.

APWSS is aware that for some organizations, journals are an essential source of revenue, which fund other activities, such as travel grants for researchers from developing countries. However, making revenue from the journal is not a priority for our Society. Instead, *Weeds* will be launched as a high-quality '**Open Access**' (OA) publishing platform, charging only a nominal administrative fee from the authors to cover the costs of using a journal-management web platform. Once published, all the articles on *Weeds* will be available free to everyone, on-line, for perpetuity.

The search for truth is the vocation of every scientist, a vocation that should inspire each of us to pursue exciting and even controversial ideas, to engage in spirited exchanges with our colleagues and critics, and to counter customary habits of thinking and analysis with new insights and observations (Institute of Medicine, 1992). *Weeds* will attempt to seek the truth about weeds and share that knowledge. The journal guidelines state that *Weeds* is dedicated to *understanding weeds and promoting improved weed management within the context of ecologically responsible and sustainable agriculture and management of our environment.*

To do this, first, we should dispel the harmful myths and bias against weeds, which has long been the enemy of weed research. The bias starts with from

the flawed premise that '*all weeds are bad news*' and they need to be controlled at any cost. Inflammatory comments that weeds and other invasive species should be treated as '*guilty until proven innocent*' - reverberate through our discipline. This bias needs to be incrementally reversed. *Weeds* will attempt to foster this change in attitude. We should question such unscientific notions within a discipline that aims to be both multi- and inter-disciplinary, and one that sets a goal to be an active contributor to sustainable ecosystems, sustainable agricultural production, and healthy human societies, which value biodiversity.

Weeds are merely pioneering plants with an innate capacity to colonize disturbed areas rapidly. Weeds have long been regarded as a significant biotic constraint in agricultural production globally. Weeds get blamed quite often for poverty, malnutrition, and food insecurity, which are rampant in developing countries. Other negative impacts of weed abundance are also increasingly recognized by managers and users of forests, parks, nature reserves, waterways, and other areas of human habitation. Nevertheless, *not all weeds are bad all the time, and indeed, not under all circumstances*. Usually, the perception of the viewer determines whether a plant is a weed or not. One person's weed can be another's joy!

There is also compelling evidence that weeds can be biological resources, not just as sources of food, medicines and raw materials for industry, but also in a broad range of environmental rehabilitation applications; e.g. reducing heavy metal contamination from mining sites and industrial effluents, which may pollute waterways and other landscapes. It may be possible to manage and manipulate 'beneficial weed' populations to promote biodiversity across vast landscapes and also to tolerate some level of weed occurrence in agriculture, instead of an *all-out war with weeds* (Chandrasena, 2014).

Traditional uses of weeds by societies needs greater recognition and study. *Weeds* will strive to promote such ideas, as the basis for a balanced understanding of weeds, particularly, their ecological roles in Nature, based on research, scholarship, and disciplined conversations. Embarking on such a conversational journey may reduce the tension between humans and weeds, which is often the result of misinformation. By focusing too much on negative aspects of weeds, and then on tools and technologies for weed control, including herbicides, perhaps, some weed scientists have forgotten that we are dealing with an extraordinary group of plants.

After a slow start in the 1950s, Weed Science has matured by integrating the knowledge of weeds from diverse fields, including biology, ecology, physiology, biochemistry, genetics, and taxonomy (Chandrasena and Rao, 2017). Over more than 70 years, our science has been hugely successful in developing the tools, techniques, and tactics to manage weeds, and help society. The discipline's immense contributions to improved crop production, reduction of other agricultural pests, including insects and plant pathogens, reduced risks to human and animal health, are well-recognized. The maturity of Weed Science is attested by its various applications, which extend well beyond agriculture to broader environmental management.

More importantly, the discipline now recognizes the culpability of the human agency as the most influential factor in the continued evolution of weeds, and the spread of weed species across the globe. The discipline cannot remain static; it must respond to new challenges, not necessarily only from weeds. Among the most significant challenges are climate change and its effects on natural and man-made ecosystems and distribution of weeds across the globe, and the development of herbicide resistance in weeds across the globe, because of overuse of herbicides. The recent interest in glyphosate, the world's most overused herbicide, as a cancer-causing agent (Andreotti, et al., 2018), is also a significant issue that weed scientists and other researchers should be focussing heavily on.

Today, thankfully, simple weed control has been replaced by a more holistic approach, under the theme of Integrated Weed Management (IWM). This strategic approach, developed over the past 30 years, ensures that our discipline contributes to more effective and practical solutions to managing weeds, where they present real problems. As there are no silver bullets to solve weed problems, a primary goal of IWM is to reduce herbicide use and to integrate all available tactics and techniques to manage weeds with an understanding of the causes why they are there in the first place. This approach also requires due consideration of the agencies that cause disturbances, which result in the spread and establishment of weeds. Nevertheless, while dealing with weeds, communicating messages on them in a balanced way, has always been problematic in our discipline. It is always relatively easy for people to malign other organisms for our inability to manage biodiversity and our environments responsibly.

Engaging with weeds is a highly beneficial activity because Weed Science, as a discipline, goes well beyond its scope into other areas of human

interest and engagement, such as culture, collaborations, co-existence and human interactions with each other, as well as with Nature. *Weeds* will promote such an engagement and understanding - that all colonizing species are very much a part of the biological diversity of the planet.

Humans will be impoverished if we continue deluding ourselves that we need, to be 'at war' with weeds in all situations, all the time. When and where weeds interfere in our affairs, their control is justified, but the journal will encourage the view that such activities need to be carried out with an enlightened understanding of the inherent values of weeds, their worth to ecosystems, and ultimately, to humanity.

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