

The Albrecht System

UNECONOMICAL AND OUTDATED

For many years, the Albrecht system of generating recommendations for soils has been promoted in the press. (The Albrecht system is also known alternatively as the Basic Cation Saturation Ratio (BCSR) or the 'cation balancing' approach). An article "Albrecht Misunderstood" published in the Farmers Weekly earlier this year included a number of alarming statements to which we, as a group of soil scientists, responded to and were pleased that our response was published in the Farmers Weekly.

FOR THIS SPECIAL AGROCHEMICAL EDITION OF THE SUGAR JOURNAL WE PROVIDE THE RESPONSE.

Before addressing the precise statements, we wish to introduce a few facts about the system:

- The Albrecht system of making recommendations was developed some 60 to 70 years ago. It is based on work carried out in Missouri and New Jersey in the 1930s and 1940s, and became known as the 'Albrecht System', after William Albrecht, who was professor of soils at the University of Missouri during that time.
- In the last 50 or so years, research conducted throughout the world by leading scientists in reputable research organisations has repeatedly and without exception shown the Albrecht approach to be flawed. These findings are well-documented and readily available in the international scientific literature. It is worth noting that much of Albrecht's research was carried out in pots. When his concepts were translated to field conditions, as was done by Dr E.O. McLean, one of Albrecht's own PhD students, the Ca:Mg balancing approach was found to be invalid. Interested readers are referred to the following

experimental studies in which the Albrecht approach was tested:

- Kopittke, PM & Menzies, NW. 2007. A review of the use of the Basic Cation Saturation Ratio and the "Ideal" soil. *Soil Science Society of America Journal* 71: 259-265.
- Edmeades, D. 2011. Base saturation ratios – why they are nonsense. *In agKnowledge Fertiliser Review* 26: 1-4.
- Thibaud, G. 2012. Liming and the relevance of soil calcium and magnesium ratios. *Fertilizer Society of South Africa Journal*: 69-84.
- Not surprisingly, the Albrecht system is roundly rejected by soil scientists in government, universities and private institutions in South Africa and overseas. Professor George Rehm, of the University of Minnesota, puts the case against Albrecht as follows: "It is an outdated, antique concept that has no value in high yield, modern agriculture".

- Significantly, the Albrecht consultants reject what they call ‘conventional’ or ‘academic’ science as taught at universities, or practised by government scientists or reputable private research institutes. They seemingly have nothing whatsoever to do with symposia or workshops dealing with advances in agricultural science, such as Crop and Soil Science Society of SA meetings, Fertiliser Society of SA workshops, or the annual SA Sugarcane Technologists’ Association congresses.
- A particular concern relating to the Albrecht approach as used by the biological farming consultants in South Africa and elsewhere is that it invariably results in *substantial increases in input costs* which do not translate into improved profitability. In practice they recommend a range of chemical products at rates and in forms that imply *substantial increases in costs to the farmer*. There are many instances where farmers have unwisely committed considerable sums of money (often in the region of hundreds of thousands of rands) to follow Albrecht recommendations. A recent case in point was a recommendation for high rates of lime – supposedly to correct the Ca:Mg ratio – *on high pH soils containing free lime!*
- After years of reading articles by the Albrecht proponents and attending the courses presented by their overseas consultants, an inevitable conclusion is that there is a generally poor and superficial understanding of soil chemistry and biology in this group. Scientific inaccuracies and errors abound in their articles and lectures. Their inability to come to grips with basic undergraduate soil chemistry concepts such as pH-dependent variable charge is startling, while statements such as “*Most plants can extract the bulk of their potash requirements from the air...*” are nothing short of bizarre (one wonders why – if they believe this – Albrecht recommendations often include prohibitively large amounts of *potassium sulphate!*).

The precise issues that we wish to address in the above-mentioned article (“Albrecht Misunderstood”) include the

following startling points:

1. ‘Academic’ soil science – as taught at universities – has major shortcomings. It is an ‘incomplete science’, in contrast to the Albrecht system.
2. A particular problem with university research in soil science is that it is funded by the fertiliser industry.
3. ‘Academic’ soil science considers only soil chemistry and physics, ignoring soil biology. The Albrecht approach, in contrast, takes into account the biology of soils.


In terms of the fertiliser industry funding university research, if Albrecht proponents bothered to attend SA Society of Crop Production or Soil Science conferences they would be better informed on the sources of funding for research. Interestingly, the fertiliser industry, to their credit, has largely rejected the Albrecht approach, even though it invariably implies vast increases in fertiliser use!

Regarding universities and other research institutes ‘ignoring soil biology’, are the Albrecht folk oblivious of the major advances in the understanding and management of soil biology that have resulted from research undertaken by universities and other research institutes in the past 20 to 40 years? Have they yet to discover that Soil Biology has long been a compulsory subject for students majoring in soil science at most leading universities? Are they not aware that there are international soil science journals devoted exclusively to soil biology? Have they never thought to consult the many brilliant MSc’s and PhD’s on soil biology and soil health that have been produced in South Africa and elsewhere in the last decades? Do they *really believe that*, unlike other sciences such as medicine and engineering, *there have been no advances in soil science in the last 70 years, and that the Albrecht fraternity had, and still has, the monopoly in terms of soil science knowledge?* (One presumes – from the trashing of universities in this way – that Albrecht followers would never consider a university education in agriculture for their children!).

Finally, in this vein, we must admit to being somewhat

bemused by the emphasis of the Albrecht proponents on 'soil biology'. The many Albrecht recommendations we have examined almost without exception include unwarranted and excessive lime rates that inevitably minimize the availability of micronutrients to crops, coupled with the use of highly acidifying ammonium sulphate and liberal dressings of other chemicals such as iron sulphate. Hardly the stuff to optimize soil health!

We fully appreciate that despite the above concerns, numbers of fervent Albrecht adherents are to be found in many farming areas and enterprises throughout SA (if nothing else, the Albrecht consultants are outstanding sales-people!). In addition, many farmers claim to have had yield increases following conversion to the Albrecht system. Why is this? There is a simple explanation, as any agricultural extension officer with a few years' experience will confirm: when a farmer spends much money on expensive inputs, he/she inevitably devotes more time and energy to crucial management practices such as ensuring the correct plant population, weed and pest control, and irrigation. It is fairly certain that in the vast majority of cases, yield increases ascribed to Albrecht recommendations are in fact due to associated *improved crop management practices*. Thus it is important to bear in mind that the numerous farmer testimonials which play a pivotal role in the biological farming sales pitch lend little credence to the approach.

Over the years, scientists have repeatedly drawn attention to the shortcomings of the Albrecht approach and its unscientific basis. Prior to the current 'Biological Farming' series, the Farmer's Weekly ran a series entitled 'Consultant's Casebook' by the same author. Both series of articles are replete with scientific errors. Despite having been informed of this, Farmer's Weekly has continued to provide a regular platform for the Albrecht consultants to ply their trade. We believe that Farmer's Weekly has a duty to provide its readers with reliable and scientifically sound information reflecting the latest and best technology on managing soils, crops, vegetables and pastures. 

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