

WACAU-2014, Israel
International Workshop on Agricultural Coal Ash Uses
27 – 29 May 2014

22 June 2014

Concluding remarks

Dear participants,

Thank you very much for your participation in the WACAU-2014 and to your contribution to its success. It was a pleasure to meet with you and to learn from your experience and knowledge. Hopefully we shall keep in contact with each other and engage in exchange of information and in joint projects on the use of coal ash in agriculture.

As pointed out in the announcement of the workshop, its organization by the Israeli National Coal Ash Board (NCAB) was motivated by the ever increasing use of coal as an energy source and the resulting accumulation of stocks of coal ash, which today is produced globally at a higher rate than any other industrial waste or by product. The beneficial use of coal ash should thus be an environmental priority and one avenue for the sustainable utilization of coal ash is its use in agriculture.

The overall objective of the workshop was to explore the agricultural uses of coal ash and to share and exchange existing knowledge on the benefits and risks associated with these uses of the ash.

The presentations by the participants in the workshop strengthened our confidence in the potential of coal ash for beneficial contribution to agriculture. Yet, a number of concerns were raised regarding the addition of the ash to agricultural fields, ranging from the possible enhanced uptake by plants of unwanted trace elements to the presumed risk of groundwater contamination and long term deleterious effects on soil productivity. These concerns were shown to be, by and large, groundless as long as the ash is used properly.

The participants provided case studies and research results that demonstrated that land application of coal ash is beneficial to farmers. For example, that ash addition improves the productivity of clay soils, weakens the crust formed upon drying of loessial soils and increases the water holding capacity of sandy soils. Application of coal ash to soils decreases erosion and can serve as a plant protection agent.

In the first session of the workshop, the characteristics of coal ashes produced in Israel were presented by Dr. Ariel Metzger, followed by a presentation on the market opportunities for coal ash within Australian agriculture, delivered by Jane Aiken. The presentation on the use of fly ash in agriculture: Indian scenario by Dr. Vimal Kumar was delivered by Dr. U. Mingelgrin since Dr. Kumar could not attend for health



reasons. It is apparent that while in Australia, agricultural use of fly ash is in its early stages, India is well advanced into demonstrating the benefit of land application of coal ash in a wide range of soil types (acid as well as high pH soils), both by experimental work and by field application. The session was concluded with the presentation of Dr. Robert Reimers from the U.S. on the utilization of alkaline coal ash in the treatment of municipal sludge, producing an agricultural soil amender. In this presentation the role of fly ash in the treatment of municipal sludge and the advantages of the resulting product as a soil amendment were depicted.

The following session dealt mainly with various specific agricultural applications of coal ash. Dr. Wayne F. Truter from South Africa described the reclamation of the agricultural potential of degraded soils with class F fly ash. Dr. Christos Tsadilas from Greece presented the expected benefits and consequences of the agricultural use of fly ash with emphasis on acid soils. Dr. Yona Chen of Israel summarized the successful experience in the use of bottom ash as a major component in soilless growing media. This session was concluded with a presentation on the use of coal ash to stabilize sand dunes against wind erosion through the enhancement of the development of biogenic crusts given by Dr. Eli Zaady from Israel.

The third session opened with a presentation by Dr. Pinchas Fine on the benefits and risks of the use of fly ash in agricultural applications, with emphasis on the land application of municipal sludge treated with lime and fly ash. This presentation summarized experience gathered in Israel during over five years of research and demonstrated the value of the sludge thus treated to farmers. Dr. Rami Keren of Israel then indicated the low risk to the environment associated with land application of the ash in his talk on risk assessment of agricultural applications of coal ash. And finally, Gustavo Haquin also of Israel demonstrated the negligible radiation exposure from radionuclides of natural origin in agricultural uses of coal ash.

An open session on innovative uses of coal ash in agriculture and on ideas for research collaboration on that topic followed. This session was, unfortunately, too short due to time constraints. Among the ideas presented was that of the use of coal ash for the production of zeolites suitable for slow release of agrochemicals and the utilization of coal ash for sequestration of the greenhouse gas carbon dioxide. We hope that exchange between the participants on innovative uses will continue in the future.

The long day of presentations was concluded with a panel discussion which highlighted the debate over the role of regulating agencies in controlling the extent and mode of use of coal ash.

The field trip that took place the next day demonstrated, we hope, the feasibility of the use of municipal sludge treated with lime and fly ash as a soil additive which is economically advantageous and serves as a slow release source of nutrients. The tour began at the Shafdan sewage treatment plant where the sludge admixed with fly ash which is used in Israel is produced. The field trip which was guided by Arie Bosak



and Dr. Pinchas Fine, also afforded a chance for hearing the positive response of farmers' representatives to the land application of this coal ash-containing product.

The last day was devoted to the introduction of the participants to the Vanderbilt University's LEAF (Leaching Environmental Assessment Framework) procedure and to the proposed project (submitted by an international research team comprised of Dr. Nadya Teutsch, Dr. Pinchas Fine, both from Israel, Dr. David Kosson from the U.S. and Dr. Hans van der Sloot from the Netherlands), on the application of the LEAF procedure to the environmental assessment of the agricultural uses of coal ash. The objective of this project is design a protocol which will serve as a tool for assessing the compatibility of coal ash from a specific source with environmental and health requirements for agricultural applications.

We believe this meeting served as an important step in the ongoing effort to optimize the use of coal ash in agriculture. We also hope that future cooperation between the participants and joint international research projects (for example on the topics covered in the session on innovative uses), will constitute an important outcome of this meeting. Hopefully, the workshop contributed to all its participants professionally, while the tours and the visit to Israel in general contributed to your knowledge of the country and its inhabitants.

Thank you again and please keep in touch,

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