There is a little doubt that adsorption of many herbicides (until now 38 are known) by ash carbon does occur in the field and that it reduces their availability.

Extrapolation of the above findings suggests that the practice of burning of crop residues such as wheat and rice straw after harvest, as well as pre-harvest burning in sugar cane, could cause a considerable reduction of herbicide activity in the following crop, if the burning occurred under suitable conditions for production of activated ash-carbon in considerable quantities.

To avoid the possible negative effect on herbicide treatments in the following crop, substituted ureas and triazines should be avoided where possible, or their application rates should be increased. Otherwise weeds with marginal susceptibility to the herbicide could become dominant due to reduced herbicide activity.

On the other hand, the knowledge that ash-carbon can adsorb herbicides, thereby reducing their activity, can be utilized. In situations where there is a suspicion that the residue from the herbicide applied to one could interfere with growth of the following crop, ash-carbon could be worked into the seed bed to reduce this risk.

Field experiments are continuing with a view to determining the conditions which control the production of activated carbon.

THE CONTROL OF WEEDS IN A CROP SITUATION BY SUPPRESSION OF SEEDLING EMERGENCE WITH STERILIZED SOIL, AND ITS POSSIBLE AGRONOMIC APPLICATIONS

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The control of herbicide-tolerant weeds presents a major problem in cucurbits, lettuce and tomato culture in south east Queensland. Their control by cultural means is being attempted. As outlined in another paper, (see this Conf. handbook p.3-17) the suppression of emergence of *Galinsoga parviflora* is possible by covering the soil to exclude light from the dormant seed and to present a physical barrier to emerging seedlings. This technique would also be appropriate

for other photoblastic weeds such as *Portulaca oleracea* and *Chenopodium album*.

Essentially, the principle of mulching is used. This has been traditionally carried out with organic material and more recently paper or plastic film. In this proposed method a layer of sterilized soil is used.

Trials were carried out where crop seed was covered with sterilized soil, and the seedlings emerged free from competition from some weeds and with reduced competition from others. A 25-mm depth of soil was sufficient to completely suppress *Galinsoga parviflora* and *Portulaca oleracea* and markedly reduce emergence of *Nicandra physalodes*. The extent of the sterile cover is being considered but must provide a weed-free zone around the emerging crop seedling about which cultivation can be safely practised. This could be in the order of 10 cm in diameter.

Planting has been carried out in the field in cavities in the soil made with a hollow cylindrical former, the latter being removed after soil fill is inserted. A planting machine developed in America uses a similar principle and could be used to mechanize the operation.

In an extension of this method activated carbon has been included in the sterilized soil fill to protect crop seed from an overall post-planting treatment with a broad-spectrum pre-emergence herbicide mixture. Cucumbers have been successfully protected from a treatment of trifluralin + prometryne by a 15-cm wide layer of soil 25 mm thick containing the equivalent of 200 kg activated carbon per hectare.

The economics of the technique would probably limit its application, at this stage, to widely spaced row crops like the cucurbits. However, it also allows local manipulation of soil conditions around the seed and it could be used as an adjunct to the plug-mix seedling technique used in America, which improves crop establishment in poor seedbed conditions.