

are already available, without depending on the development of new herbicides to overcome specific problems.

HEXAFLURATE: A NEW HERBICIDE FOR
CONTROL OF HARRISIA CACTUS

G.J. Harvey
Department of Lands, Queensland

A major problem in the attempted control of *Harrisia cactus* (*Eriocereus martinii*) with herbicides was their failure to kill all tubers, and regrowth occurred from even very small tuber segments. This problem is now being overcome by use of a new herbicide, hexaflurate.

Hexaflurate is a crystalline solid, non-volatile under all climatic conditions, but will volatilize if heated to very high temperatures (by fire), soluble in water and has low acute mammalian toxicity. It is not broken down by light, is stable to hydrolysis and hence very stable in soil, and is not, apparently, subject to biological degradation in plant or soil. It is not absorbed by stems or leaves, but is absorbed by roots, and, in common with other arsenicals, is strongly retained in the top few centimetres of soil to which it is applied.

The mode of action of hexaflurate is unusual. It is absorbed by *Harrisia* with the soil moisture in which it dissolves. Movement in the plant is consistent with movement in the transpiration stream. Hexaflurate apparently concentrates in tubers and upper segments of stems, which then die, releasing the unchanged chemical back into the soil whence it is reabsorbed. It is thus continuously 'recycled', causing death of further stem segments, tubers, and roots as this 'recycling' progresses. Since it is retained in the top few centimetres of soil, hexaflurate is not lost from the root zone of *Harrisia*, which has extensive but shallow feeding roots.

Hexaflurate strongly inhibits flower and fruit production in *Harrisia*; these processes are dependent on the starch reserves in the tubers, so this inhibition is probably a consequence of the destruction of tubers by the herbicide. Regrowth from tuber segments has ceased to be a problem.