COMMERCIALISATION

History Herbicidal properties reported by H. Koopman & J. Daams (*Nature* [*London*], 1960, **186,** 89). Introduced by Philips-Duphar B.V. (now Solvay Duphar B.V.).
Patents NL 572662; US 3027248 **Manufacturer** Cyanamid; Solvay Duphar.

APPLICATIONS

Mode of action Systemic herbicide which acts by inhibition of cellulose synthesis of actively growing plant tissue. Inhibits actively dividing meristems, germination of seeds and damages rhizomes. Its selectivity can be ascribed to the fact that it is bound to the top 5-10 cm of the soil. **Uses** For selective weed control of annual and many perennial weeds in woody ornamentals, fruit orchards, vineyards, bush fruit, forest plantations, public green areas at dosages between 2.7 and 5.4 kg a.i./ha. For total weed control in non-crop areas at dosages up to 13.5 kg a.i./ha. Control of floating, emergent or submerged aquatic plant growth in non-flowing water at 2.7-8.1 kg/ha, depending on water depth. **Phytotoxicity** Some conifers are susceptible to dichlobenil vapour due to their bark structure. **Formulation type** GR; WP. **Compatibility** Wettable-powder formulation is compatible with other wettable-powder herbicides.
Principal tradename 'Casoron' (Solvay Duphar), 'Barrier' (PBI/Gordon), 'Silbenil' (Siapa). **Mixtures** [*dichlobenil* +] simazine; diuron.

ANALYSIS

Product analysis by glc with FID (*CIPAC Handbook,* 1983, **1B,** 1769; *AOAC Methods,* 1990, 979.03; A. van Rossum, *Anal. Methods Pestic. Plant Growth Regul.,* 1978, **10,** 311) or by spectrometry. **Residues** determined by glc (K. I. Beynon *et al., J. Sci. Food Agric.,* 1966, **17,** 151).

MAMMALIAN TOXICOLOGY

Acute oral LD_{50} for rats 4460, male mice 1014, female mice 1621 mg/kg.
Skin and eye Acute percutaneous LD_{50} for albino rabbits > 2000 mg/kg. Non-irritating to skin (rabbits). **Inhalation** LC_{50} (4 h) for rats > 250 mg/m^3. **NOEL** (2 y) for rats 50 mg/kg diet. In 2-generation feeding study for rats NOEL 60 mg/kg diet.
ADI 0.025 mg/kg b.w. **Toxicity class** WHO Table 5; EPA III. **Other** Acute i.p. LD_{50} for female mice 603 mg/kg.

ECOTOXICOLOGY

Birds Eight-day dietary LC_{50} for bobwhite quail *c.* 5200, mallard ducks > 5200 mg/kg diet. **Fish** LC_{50} (96 h) 5-13 mg/l (various fish species). **Bees** Not toxic to bees; LD_{50} (contact) > 11 µg/bee. **Daphnia** EC_{50} (48 h) 6.2 mg/l. **Other beneficial spp.** LD_{50} for earthworms > 1000 mg/kg substrate. Harmless to carabids. No effect on soil microflora.

ENVIRONMENTAL FATE

Animals Metabolised and excreted mainly as hydroxylated conjugates. For fate in animals, see K. I. Beynon and A. N. Wright *Residue Rev.* 1972, **43,** 23; A. Verloop *ibid.* 1972, **43,** 55. **Plants** The soil metabolite 2,6-dichlorobenzamide can be taken up by plants via the roots. Plant metabolism involves ring hydroxylation (at the 3-position and, to a lesser extent, at the 4-position) of both dichlobenil and 2,6-dichlorobenzamide, and subsequently conjugation with a sugar. See K. I. Beynon and A. N. Wright *Residue Rev.* 1972, **43,** 23; A. Verloop *ibid.* 1972, **43,** 55. **Soil and water** Has a low leaching potential. In soil, dichlobenil gradually undergoes microbial degradation to 2,6-dichlorobenzamide, which