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The endocrine-disrupting potential of four commonly used azole fungicides, propiconazole, tebuconazole, epoxiconazole and ketoconazole, were tested in two short-term in vivo studies. Initially, the antiandrogenic effects of propiconazole and tebuconazole (50, 100 and 150 mg/kg body weight/day each) were examined in the Hershberger assay. In the second study, pregnant Wistar rats were dosed with propiconazole, tebuconazole, epoxiconazole or ketoconazole (50 mg/kg/day each) from gestational day (GD) 7 to GD 21. Caesarian sections were performed on dams at GD 21. Tebuconazole and propiconazole demonstrated no antiandrogenic effects at doses between 50 and 150 mg/kg body weight/day in the Hershberger assay. In the in utero exposure toxicity study, ketoconazole, a pharmaceutical to treat human fungal infections, decreased anogenital distance and reduced testicular testosterone levels, demonstrating a demasculinizing effect on male fetuses. Tebuconazole, epoxiconazole and ketoconazole induced a high-frequency of post-implantation loss, and both ketoconazole and epoxiconazole caused a marked increase in late and very late resorptions. Overall the results show that many of the commonly used azole fungicides act as endocrine disruptors in vivo, although the profile of action in vivo varies. As ketoconazole is known to implicate numerous endocrine-disrupting effects in humans, the concern for the effects of the other tested azole fungicides in humans is growing.