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Multitype bistability and long transients in a delayed budworm model

For a delayed budworm model, we show that the delay induce four types of bistability: (i) a node-node bistability (one stable positive equilibrium coexists with another stable positive equilibrium); (ii) a node-cycle bistability (one stable equilibrium coexists with a stable periodic solution); (iii) a cycle-cycle bistability (one stable periodic solution coexists with another stable periodic solution); and (iv) a node-chaotic attractor bistability (one stable positive equilibrium coexists with a chaotic attractor). Moreover, we also show that delay can induce long transients.