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MEMORANDUM: DESCRIPTION OF BIOLOGICAL ACTIVITY OF
HERBICIDE ORANGE

1. Orange herbicide is an effective herbicidal mixture for control of a wide array of woody and broadleaf herbaceous plants. The components of Orange are considered as growth-regulating chemicals. When applied at extremely low dosages they may stimulate plant growth, but may be inhibitory or lethal at higher concentrations. When applied to the foliage of herbaceous vegetation, Orange is absorbed and moved throughout the plant in the phloem (sap stream). Such a "systemic action" allows the herbicide to be applied at one point on the plant and yet cause a herbicidal effect (bending, curling, or elongation) at yet another point on the plant (e.g., meristematic tissue).
2. The typical response of mixed vegetation to an application of Orange shows first as a browning and discoloration of the foliage within a period of 1-2 weeks. Foliage of the more susceptible species may turn brown very rapidly (days) and the subsequent leaf drop will occur over a period of 1-2 months after spray application. As herbicidal response proceeds, the branches die back progressively from the tip, accompanied by defoliation. When only partial kill of the individual plant occurs, regrowth and new foliage will develop from the main stems and larger branches.
3. The active components of Orange interfere with the photosynthetic, respiratory and metabolic processes in the plant. There appears to be a close association between the herbicide and the regulation of ribonucleic acid (RNA) synthesis, suggesting that the primary effect of such herbicides may be interference with protein metabolism. At low rates the herbicide stimulates protein production and hence cell growth. However, at higher rates of herbicide, protein synthesis is disrupted. Certainly, the effects of phenoxy-herbicides on protein regulation may help account for all the secondary effects noted with such herbicides (i.e., changes in carbohydrate levels and in the accumulation of amino acids in susceptible organisms).

Prepared by; Capt Young