

**Grow Ecology, LLC, Consultants**

growecology.com

(509) 227-9304

**Grow Ecology Green Paper #4  
Modes of Growing Cannabis**

Dr. Richard Freeman

rick@growecology.com

<b>Growing Medium</b>	<b>Root Environment</b>	<b>Growing Environment</b>	<b>Feeding Mode</b>	<b>Feeding Mechanisms</b>	<b>Wastes</b>	<b>Advantages</b>	<b>Comments</b>	<b>Disadvantages</b>
<b>Water</b>	Container	Indoor Greenhouse	Feed the plant Flush medium	Solutions and suspensions	Chemical-laden water Trim, Stems and Roots	Environmental Control Feeding Control Root Environment Containment Plant portability		Water waste Lack of natural nutrient-cycles Susceptible to pests. High water dependence Chemical costs Chemical traces
<b>Drip Media</b>	Container	Indoor Greenhouse	Feed the plant Flush medium	Solutions	Chemical-laden water Trim, Stems and Roots	Environmental Control Feeding Control Root Environment Containment Plant portability		Water waste Media waste Lack of natural nutrient-cycles Susceptible to pests. High water dependence Chemical costs Chemical traces
<b>Soil-Mix Media</b>	Container	Indoor Greenhouse Season Extension	Feed the soil No flush	Compost teas, Botanical infusions and mineral infusions		Root Environment Containment Plant portability Biological nutrient-cycles	Optimality increases with larger soil-to-size ratio	Soil-mix media waste Sub-optimal natural nutrient-cycles Medium-to-high water dependence
<b>Soil</b>	Field Soil	Outdoor Season Extension				Biological diversity Full natural resistance mechanisms Full natural nutrient-cycles No water waste No soil waste Fewer long-term costs Better water retention System builds soil and ecology	Above ground Below ground Aligns with evolutionary environment	Requires more space per plant More up-front costs