# C1981
# PhytoReady™ Murashige & Skoog Cannabis Multiplication Medium with *meta*-Topolin

## Properties:

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|---|---|
| Form: | Gel |
| Appearance: | Gel |
| Application: | Plant Tissue Culture |
| Solubility: | Water |
| Typical Working Concentration: | 43.3 g/L |
| Storage Temp: | 2-8ºC |
| Other Notes: | Contains the macro- and micronutrients and vitamins as described by Murashige and Skoog (1962): Modified with the addition of: 0.5 mg/L meta- topolin & 1 ml/L Gamborg's vitamins. Also contains 30 g/L Sucrose and 8 g/L Agar. Premixed, sterilized, and dispensed into 25x150mm polycarbonate culture tubes. |

## Formula (mg/L):

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| Ammonium Nitrate | 1650 |
| Boric Acid | 6.2 |
| Calcium Chloride, Anhydrous | 332.2 |
| Cobalt Chloride•6H2O | 0.025 |
| Cupric Sulfate•5H2O | 0.025 |
| Na2EDTA•2H2O | 37.26 |
| Ferrous Sulfate•7H2O | 27.8 |
| Magnesium Sulfate, Anhydrous | 180.7 |
| Manganese Sulfate•H2O | 16.9 |
| Molybdic Acid (Sodium Salt) •2H2O | 0.25 |
| Potassium Iodide | 0.83 |
| Potassium Nitrate | 1900 |

| | |
|---|---|
| Potassium Phosphate Monobasic | 170 |
| Zinc Sulfate•7H2O | 8.6 |
| myo-Inositol | 100 |
| Nicotinic Acid (Free Acid) | 1.0 |
| Pyridoxine•HCl | 1.0 |
| Thiamine•HCl 1 | 10.0 |
| Meta-Topolin | 0.5 |
| Sucrose | 30,000 |
| Agar, Micropropagation Grade | 8000 |

## Application Notes:

PhytoReady™ Murashige & Skoog Hemp Multiplication Media is a ready-to-use plant tissue culture medium gelled in polycarbonate culture tubes (product C2035). Murashige and Skoog (MS)-media used in this product was developed to culture tobacco, and in general works well supporting the growth of herbaceous (non-woody) plant species, including hemp. It is the most commonly used media in plant tissue culture. The plant growth regulators added in these proportions are known to support multiplication or shoot growth over rooting. This medium also contains sucrose as a carbohydrate source, and agar as a gelling agent. The meta-topolin is added to support shoot multiplication. Each tube contains approximately 20 mL of media. After 30-60 days, tissue can be subcultured to multiply the tissue into more shoots, or it can be applied to pre-transplant or rooting medium to encourage root organogenesis and proliferation on tissue.

It can take weeks to many months for plant tissue to first become acclimated to growth in tissue culture with plant growth regulators. It can be erratic with very substantial growth or slow growth initially.

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Unwrap the tubes, and aseptically add disinfected*** tissue to the medium, and store at 25°C under sufficient lighting at 16 hours of light/8 hours of dark intervals. Young juvenile tissue is best to start from.

Please Note: While PhytoTechnology Laboratories® tests each lot of this product with two or more plant cell/ tissue culture lines, it is the sole responsibility of the purchaser to determine the appropriateness of this product for the specific plants that are being cultured and applications that are being used.

***Tissue is generally disinfected for 5-15 minutes in a solution of bleach diluted anywhere from 1:10 to 1:2 with a few drops of Tween 20 (P720) added per 50 mL's and gently mixed. It should then be rinsed with 3-4 volumes of autoclaved/pressure cooked sterile water. These are merely guidelines, and your tissue may require more or less time in more or less concentrated bleach solutions. The goal of tissue disinfection is to find the least harsh solution and amount of time in that solution that will remove fungi and bacteria, yet not induce plant cell and tissue death. Browning of the tissue can sometimes occur during disinfection. This can be reduced by reducing the time incubated in the bleach solution and the concentration of diluted bleach. The spread of browning on the tissue can also be reduced by dipping tissue in the Antioxidant solution (Product No. A120) following the final sterile water rinse.

## References:

Lata *et al.* (2016) In vitro mass propagation of *Cannabis sativa* L.: A protocol refinement using novel aromatic cytokinin meta-topolin and the assessment of eco-physiological, biochemical and genetic fidelity of micropropagated plants. *Journal of Applied Research on Medicinal and Aromatic Plants.* Volume 3(1):18-26

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