**DEFINITION OF TERMS**

**ADJUVANTS:** This is any substance in herbicide formulation or added to spray tank or improve herbicide activities or application characteristics.

**A CARRIER** is a substance (gas, liquid or solid) used to dilute or suspend a herbicide during its application..

**SURFACTANTS:** this is a material which improves the emulsifying, dispersing, spreading, wetting or other surface modifying properties of liquid.

**EMULSIFYING AGENTS (EMULSIFIERS)**

These are chemicals that improve the suspension of particles of one liquid in another liquid. They are also referred to as emulsifiers.

**WETTING AGENTS**

Wetting agents are surface active agents that reduce the interfacial tension as well as improving the contact between a liquid and surface on which it is applied.

**STICKERS**: These are spreaders which also reduce the surface tension of other liquid and decrease the possibility of aqueous solution to form discreet droplets.

**DETERGENTS**: They are cleansing chemicals used mainly for cleaning equipment/sprayers.

 **HERBICIDE FORMULATION**

This is a process by which pure chemicals (e.g.) the active ingredient of a herbicide is prepared and made available for use in a form that will improve handling, storage, application, efficacy and safety.

In order to produce a good commercial herbicide, the formulation chemist must try to maintain a good chemical additives such as emulsifiers, wetting agents and inert materials to make a new herbicide formulation.

**Reasons why herbicides are formulated:**

• To reduce the concentration of the active ingredient through dilution in appropriate solvent.

• To make the pure chemical available in a form that will permit uniform distribution of target.

• To reduce the level of contamination and hazard during handling and application.

• To improve the efficacy of the herbicide through slow release of the active ingredient.

• Better protection from degradation.

• Greater uptake by the weed.

• To reduce cost of weed control with that particular herbicide. For example, the choice of wettable powder over emulsifable concentrate and vice-versa may be, based to a large extent on which of the formulation is easy to produce and market

**Types of herbicide formulation**

• **Water soluble (WSC, SL)**

• **Emulsifiable concentrate (EC)**

• **Wettable powder (WP)**

• **Flowable formulation (FW, F)**

• **Granular Formulations (G)**

• **Water Dispersible Granules (EDG, SG, DG)**

• **Salts**

• **Pellets**

• **Microencapsulation**

WEED CONTROL IN CROPPED AND NONCROPPED LANDS

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Name of crop** | **Hand weeding (WAP)**  | **Herbicide application** | **Rate of application (kg a.i./ha)** | **Time of application** |
|  CEREAL CROPS  |  |  |  |  |
| Maize (*Zea mays)*  | 2-3 and 5-7 | 1.atrazine + alachlor 2.atrazine + metolachlor 3.atrazine + pendimethalin  | 3.03.02.0+2.0  | PEPEPE |
| **Name of crop** | **Hand weeding (WAP)**  | **Herbicide application** | **Rate of application (kg a.i./ha)** | **Time of application** |
| **Cowpea (*Vigna unguiculata)*** | **2-3 and 6-8** |  **pendimethalin + imazaquin**  **metolachlor + imazaquin**  **trifluralin**  | **1.5+0.2****1.25+0.2****1.0-1.5** | **PE****PE****PE** |
|  |  |  |  |  |

**Leguminous crops**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Name of crop** | **Hand weeding (WAP)**  | **Herbicide application** | **Rate of application (kg a.i./ha)** | **Time of application** |
| **Cowpea (*Vigna unguiculata)*** | **2-3 and 6-8** |  **pendimethalin + imazaquin**  **metolachlor + imazaquin**  **trifluralin**  | **1.5+0.2****1.25+0.2****1.0-1.5** | **PE****PE****PE** |
|  |  |  |  |  |

**Vegetable crops**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Name of crop** | **Hand weeding (WAP)**  | **Herbicide application** | **Rate of application (kg a.i./ha)** | **Time of application** |
| **Tomato *(Lycopersicum esculentum*)** | **2-3 and 6-8** |  **Metribuzin**  **Diphenamide**  **Napropamide**  | **0.25 - 0.35****4.0 – 5.0****1.0 – 2.0**  | **PE (or at transplanting)****PE****PE** |

**Root and Tuber crops**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Name of crop** | **Hand weeding (WAP)**  | **Herbicide application** | **Rate of application (kg a.i./ha)** | **Time of application** |
| **Cassava *(Manihot esculentus***  | **3, 8 and 12** | **atrazine + pendimethalin** **atrazine + metolachlor (Primextra)** | **3.0****3.0**  | **PE****PE** |

**AQUATIC WEEDS**

|  |  |  |
| --- | --- | --- |
| **Name of weed**  | **Herbicide**  | **Rate (kg ai)**  |
| **Most weeds** | **fluoridone**  | **0.6 – 4.5** |
| **Water hyacinth** | **diquat**  | **0.5 – 0.7** |
| **Salvinia spp.** | **Diquat** **2.2,4-D** | **0.9 – 1.8****3.6 (apply to surface)** |

**WEED CONTROL IN LANDSCAPE**

• **Weed control options in landscape include:**

•  **hand weeding**

• **Cultivation**

•  **mowing**

• **Mulching**

• **Use of herbicides e.g. glyphosate, oxadiazinon (Ronsta) and oxyfluorfen (Goal).**

**ROADSIDE AND ESTATE WEED CONTROL**

• **Strip of vegetation by the road side and around buildings constitutes roadside weeds.**

•  **Such weeds should be controlled at less cost.**

•  **Regular hand weeding will control most weeds.**

**use of non - selective post emergence herbicides (e.g. glyphosate or amitrole) will give a satisfactory weed control.**