SUMMARY

[0006] According to a first aspect of the present invention, there is provided an article for enriching soil fertility, the article comprising:

a plurality of containers, each containing one or more fertilizers;

a housing separately containing each of the plurality of containers,

wherein each of the plurality of containers and the housing has a respective fluid-permeable membrane, and

wherein permeabilities of the membranes and contents of the one or more fertilizers are selected to control a release of the fertilizers from the containers and the housing.

[0007]

[0008]

[0009] The fluid-permeable membrane may comprise at least one selected from a group consisting of kraft paper, recycled paper, sack kraft, polylactic acid derived polymers, polyhydroxyalkanoate derived polymers, polyethylene-derived polymers, polyurethane-derived polymers, polymer laminated onto paper and polymer laminated on polymer.

[0010] The fluid-permeable membrane may be made of one or more degradable materials selected from a group consisting of a biodegradable material, oxo-degradable and photodegradable materials.

[0011] The fluid-permeable membrane may comprise a perforated membrane.

[0012] The one or more fertilizers may be selected from a group consisting of a bio-fertilizer, a mineral fertilizer, an organic fertilizer, an inorganic fertilizer and a chemical fertilizer.

[0013] The bio-fertilizer may be disposed in a separate container from the inorganic fertilizer.

[0014] At least one of the plurality of containers may further comprise a moisture regulator configured to repeatedly absorb moisture from outside said container and release the absorbed moisture into a space within said container based on a moisture gradient existing between the space within said container and outside said container, to control a release of the fertilizer from said container through the membrane.

[0015] The moisture regulator may comprise a plurality of hydrogels.

[0016] According to a second aspect of the present invention, there is provided a method of manufacturing an article for enriching soil fertility, the article comprising a plurality of containers and a housing, the method comprising the steps of:

selecting permeabilities of membranes of the plurality of containers and the housing;
selecting contents of one or more fertilizers to be disposed in each of the containers;
disposing the selected one or more fertilizers in the respective containers; and
separately disposing the plurality of containers in the housing.

[0017] According to a third aspect of the present invention, there is provided a method of enriching soil fertility, the method comprising the step of placing the article as defined in the first aspect adjacent to a root of a plant.

BRIEF DESCRIPTION OF THE DRAWINGS

[0018] of the invention are provided by way of example only, and will be better understood and readily apparent to one of ordinary skill in the art from the following written description and the drawings, in which:

[0019] Figure 1 illustrates a schematic diagram of an article for enriching soil fertility in accordance with an example embodiment.

[0020] Figure 2A illustrates the process of moisture absorption of the article of Figure 1.

[0021] Figure 2B illustrates an initial stage of the process of a release of fertilizers from the article, following the moisture absorption process shown in Figure 2A.

CLAIMS

1. An article for enriching soil fertility, the article comprising:

a plurality of containers, each containing one or more fertilizers;

a housing separately containing each of the plurality of containers,

wherein each of the plurality of containers and the housing has a respective fluid-permeable membrane, and

wherein permeabilities of the membranes and contents of the one or more fertilizers are selected to control a release of the fertilizers from the containers and the housing.

2. The article as claimed in claim 1, wherein the fluid-permeable membrane comprises at least one selected from a group consisting of kraft paper, recycled paper, sack kraft, polylactic acid derived polymers, polyhydroxyalkanoate derived polymers, polyethylene-derived polymers, polyurethane-derived polymers, polymer laminated onto paper and polymer laminated on polymer.

3. The article as claimed in claim 1 or 2, wherein the fluid-permeable membrane is made of one or more degradable materials selected from a group consisting of a biodegradable, oxo-degradable and photodegradable materials.

4. The article as claimed in any one of the preceding claims, wherein the fluid-permeable membrane comprises a perforated membrane.

5. The article as claimed in any one of the preceding claims, wherein the one or more fertilizers are selected from a group consisting of a bio-fertilizer, a mineral fertilizer, an organic fertilizer, an inorganic fertilizer and a chemical fertilizer.

6. The article as claimed in claim 5, wherein the bio-fertilizer is disposed in a separate container from the inorganic fertilizer.

7. The article as claimed in claim 5 or 6, wherein at least one of the plurality of containers further comprises a moisture regulator configured to repeatedly absorb moisture from outside said container and release the absorbed moisture into a space within said container based on a moisture gradient existing between the space within said container and outside said container, to control a release of the fertilizer from said container through the membrane.

8. The article as claimed in claim 7, wherein the moisture regulator comprises a plurality of hydrogels.

9. A method of manufacturing an article for enriching soil fertility, the article comprising a plurality of containers and a housing, the method comprising the steps of:

selecting permeabilities of membranes of the plurality of containers and the housing;

selecting contents of one or more fertilizers to be disposed in each of the containers;

disposing the selected one or more fertilizers in the respective containers; and

separately disposing the plurality of containers in the housing.

10. A method of enriching soil fertility, the method comprising the step of placing the article as claimed in any one of claims 1 to 8 adjacent to a root of a plant.