(Acrobe® TP), one or more hydrophobic and/or hydrophilic silica carriers and one or more Citroflex®, Morflex® and/or cetyl alcohol coatings (Examples 1–7) were added to each of the aqueous acrylic copolymer formulations and placed on a mechanical shaker and vigorously mixed for ca. 5 minutes to assure that the silica-base compositions were uniformly suspended throughout the water column. Results of the suspendability tests indicated that these powdered compositions could be readily dispensed in water with conventional spray equipment. Suspension of compositions in petroleum or nonpetroleum oils for spray application is also proposed.

EXAMPLE 9

In another test, an aqueous formulation of the aquatic herbicide Aquathol®K (dipotassium salt of endothall) was admixed with a joint-function (carrier/coating) polyvinyl alcohol film (MonoSol® 8000 series, M-7030, M-8533 or M-8030) and agglomerated into a solidified controlled delivery mass in a series of solvent precipitation and evaporation procedures. The admixing protocol utilized was similar to procedures described in Examples 4, 5, and 7. As indicated in the earlier examples, polyvinyl alcohol film (specific gravity greater than one) is soluble in water (temperature dependent) but insoluble in most organic and inorganic solvents, hydrocarbons or oils. These properties are also similar for polyethylene oxide and hydroxypropyl methyl cellulose water-soluble films. MonoSol® 8000 series was obtained from the manufacturer as solid sheets/pouches and dissolved in water (20% polyvinyl alcohol film) while MonoSol® M-7030, M-8533 and M-8030 were obtained as water-base solutions (16.1–16.4% polyvinyl alcohol film).

The following formulations were utilized in fabricating the joint-function polyvinyl alcohol compositions of Aquathol®K: Composition AK1—4 g dipotassium salt of endothall (Aquathol®K)+12.5 g polyvinyl alcohol film (MonoSol® 8000 series)+46 distilled water+acetone bath series; Composition AK2—2q dipotassium salt of endothall (Aquathol®K)+7.4 g polyvinyl alcohol film (MonoSol® M-7030)+40.6 g distilled water+acetone bath series; Composition AK3—2 g dipotassium salt of endothall (Aquathol®K)+7.3 g polyvinyl alcohol film (MonoSol® M-8533)+40.7 distilled water+acetone bath series; and Composition AK4— 2 g dipotassium salt of endothall (Aquathol®K)+7.3 g polyvinyl alcohol film (MonoSol® M-8030)+40.7 g. distilled water+acetone bath series.

The dried agglomerated briquet compositions of AK1, AK2, AK3, and AK4 consisted of 24.4, 21.5, 21.7, and 21.8% (w/w) dipotassium salt of endothall, respectively. Commercial Aquathol®K granules contain only 10.1% dipotassium salt of endothall.

Results of the admixing procedures indicated that high levels of Aquathol®K can be agglomerated into solid polyvinyl alcohol-base compositions for fast-release application into an aquatic habitat for control of nuisance vegetation. All compositions solubilized in fresh water within 2 hr of introduction and showed differential degrees of floating or sinking depending on the type and/or concentration of polyvinyl alcohol utilized in the formulation.

Loading levels were significantly higher than the standard commercially available granular Aquathol®K product (i.e., 10.1% dipotassium salt of endothall), and therefore, a lesser amount (on a weight basis) per acre of MonoSol®/Aquathol®K would be required to treat an acre of aquatic weeds when compared to the amount or weight of conventional Aquathol®K granular product needed per acre to be equivalent to the concentration of dipotassium salt of endothall in the composition. The results indicated that significantly higher loading levels can be obtained with the polyvinyl alcohol-base protocol. Addition of one or more coatings, surfactants, binders, and the like is expected to change the controlled release profiles of the compositions. Any herbicide can be fabricated into a solid controlled delivery composition utilizing the joint-function polyvinyl alcohol-base admixing protocol.

The foregoing coating components, bioactive agents and carrier components can be selected to control or eliminate various terrestrial organisms, and especially nuisance plant and animal organisms such as weeds, rodents and insects, including but not limited to cockroaches, ants, fire ants, termites, and other varieties of biting insects, disease carrying insects, crop eating insects, and wood eating insects. The coatings that are selected in this regard are the degradable ones, e.g. biodegradable coatings selected from those listed above, and those that also will protect the bioactive agent from degradation, especially ultraviolet light degradation. The coatings are also selected to release the bioactive agent over a period of time so as to increase the effectiveness of the bioactive agent.

The compositions of the invention can also be utilized in the treatment of parasitic or insect caused diseases in animals, especially the G.I. tract of animals such as ruminants, by selecting those components of the composition that are approved for animal use. When properly administered they can be employed to provide time release compositions for the treatment of various diseases and disorders. Non-bioactive compounds or compositions can be used in lieu of the bioactive agents for the treatment of certain disorders such as the treatment of hoven in ruminants by means of surfactant silicone compounds. Some non-limiting examples of other compounds that may be used in the treatment of animals is disclosed by Drummond et al., *Control of Arthropod Pests of Livestock: A Review of Technology*, 1988, CRC Press, Inc. which is incorporated herein by reference.

In the course of preparing the various compositions of the invention it was further discovered that in many instances the materials employed as coatings, carriers, and binders were interchangeable. Joint-function carrier coating materials have been described, but in the broader aspects of the invention, the coating, carrier, and binder compounds or compositions are to be categorized primarily by the way they are employed in the composition i.e. by the way the function because of the interchangeability of the various compounds and compositions that are useable in this regard.

The principles, preferred embodiments, and modes of operation of the present invention have been described in the foregoing specification. The invention which is intended to be protected here, however, is not to be construed as limited to the particular forms disclosed, since these are to be regarded as illustrative rather than restrictive. Variations and changes may be made by those skilled in the art without departing from the spirit of the invention.

What I claim is:

1. A composition of matter consisting essentially of a complex for treating a population of one or more aquatic organisms, said complex consisting essentially of at least one controlled delivery system, said controlled delivery system consisting essentially of from about 50% to about 99% by weight of at least one carrier component, from about 0.0001% to about 50% by weight of at least one bioactive agent as a component selected for treating a population of one or more aquatic organisms, from about 1.0% to about