



## UPLAND HOLISTIC DEVELOPMENT PROJECT



### **Gardening Activity: Making Fermented Plant Juice**

- Objective:** To gain skills in making and using fermented plant juice in composting, gardening and livestock production.
- Time Req:** **30 minutes to prepare materials for fermenting;** One month to ferment; 10 minutes to periodically collect fermented plant juice; 15 minutes to mix and spray fermented fruit juice in gardens, pig pens, etc.
- References:** *Gardening for Nutrition in the Upland Villages of the Golden Triangle, Korean Natural Farming*
- Materials:** Machete, ripe fruits (banana, papaya, etc.), brown sugar, scales, ceramic crock, brown wrapping paper (or newspaper), twine, syringe pump for collecting the fermented plant juice, plastic bottles or jugs, backpack sprayer.
- Procedure:** Based on traditional Korean farming, indigenous microorganisms (IMO) found in fermented plant juices and other materials reportedly quicken the decomposition process of compost. Many farmers also claim that supplemental IMO's help to improve soil fertility when fermented plant juice solutions are sprayed on fields, as well as to strengthen the ability of crops to resist pests. There are also claims that floral differentiation is increased when fermented plant juices are sprayed on plant leaf surfaces. UHDP has noticed that applications of fermented plant juice solutions help to reduce odor in and around livestock pens.
- Step 1 – select plant materials to be fermented**
- With the help of UHDP personnel, select 1-2 kg of mature sweet fruits such as pineapple, banana or papaya. Non-sweet banana stalks or bamboo shoots may be selected for use as well.
- Step 2 – cut up larger plant materials**
- Larger items, such as papaya and pineapple fruits, banana stalks, and bamboo shoots should be sliced into smaller chunks that will fit through the mouth of a ceramic crock.
- Step 3 – mixing with brown sugar**
- If sweet fruits are used, thoroughly mix 1 kg of prepared fruit with 1 kg of brown sugar and place the mixture into a ceramic crock. If non-sweet plant materials are used (e.g. banana stalks, bamboo shoots), mix in about 2 kg of brown sugar with 1 kg of prepared fruit and place into an urn.

#### **Step 4 – fermentation of the materials**

- Fasten brown wrapping paper (or newspaper) over the mouth of the urn. Place the urn in a cool, dry place that's out of direct sunlight. Allow the mixture to ferment in the urn for a month, taking care not to disturb it.

#### **Step 5 – collecting and storing the fermented plant juice**

- After a month, a brown fermented liquid will have begun to collect at the bottom of the urn. This liquid, in which IMO's are found, can be sucked out with a long syringe pump, then stored in a plastic bottle or used directly. Always cover the mouth of the urn with wrapping paper each time after collecting fermented plant juice. Also, be sure to store the urn or stored fermented plant juice in a cool, dry location that's out of direct sunlight.
- For practice, extract the fermented plant juice from the bottom of an urn for either immediate use or for storage.

#### **Step 6 – long-term management of fermenting plant juice**

- Given proper storage, the plant-sugar mixture should continue to ferment over the next few months during which the IMO liquid can be accessed for use. However, the mixture should be inspected from time to time. We can tell that the mixture has expired when the residues in the urn have turned completely black. However, the presence of a white mold over the materials indicates that the mixture is still viable.

#### **Step 7 – use of fermented plant juice**

- The fermented plant juice can be mixed with water to make a spray solution for application to plants, field and garden soil, compost heaps and animal pens at a rate of 1 teaspoon of fermented juice per liter or 1.5 tablespoons per 20 liters.
- For practice, collect some fermented plant juice from either an urn or a storage bottle, mix it with water according to recommendations for use in a backpack sprayer and apply the solution in the garden or in animal pens.

#### **Questions**

Why might fermented plant juice help accelerate the composting process or reduce odor in animal pens?

What is the role of brown sugar in the fermentation process?

Besides reducing odor in animal pens, how else is fermented plant juice used in livestock production?

How might we determine whether claims regarding fermented plant juice are valid or not?