

Homework Assignment 4: Reading on Heroin and Saffron Cultivation

According to the CIA¹, the cultivation of the opium poppy, *Papaver setigerum*, and collection of opium gum or latex is a straight-forward activity requiring no technology, no specialized tools, no real expertise or investment (beyond the purchase of inexpensive poppy seeds), and not very much labor.

“The hill tribe growers [of Burma, Laos, Thailand, Afghanistan, Pakistan, Columbia and Mexico] use a technique called slash-and-burn farming to prepare the poppy fields for planting. After all the trees have been cut down and vegetation cleared and burned, the farmers take handfuls of seed and spread them over the field. Poppies take about three months to mature, and the farmer may weed the fields once or twice during that time. When the plants are mature, the farmers start harvesting the opium gum using primitive, unsanitary tools, made from whatever can be found nearby.”

Generally speaking, poppy fields do not require irrigation, fertilizer or pesticides in order to harvest a successful opium crop. In cases where additional fertilization is needed, human fecal matter² is commonly used. A family of two adults and several children can easily maintain one to three acres of poppy fields (in addition to raising more conventional crops, such as corn, and animals). In a typical year, each acre of poppies will produce approximately 25 kilograms of opium gum³.

On the other hand, the cultivation and harvesting of saffron is difficult and expensive. Saffron consists of the tiny (less than one inch in length) stigmas collected from the flowers of the plant *Crocus sativus*. This plant does not naturally form seeds, so it must be reproduced by labor-intensive, vegetative means. The plants themselves must be well irrigated, but are adversely affected by too much water. Growers must therefore be careful to ensure that saffron fields are both adequately irrigated and adequately drained. As the harvest from *Crocus sativus* is principally a food item, and washing of the harvested stigmas is neither practical nor desirable⁴, the use of herbicides and pesticides to protect the crop is impossible. All weeding and pest (e.g. rabbits who relish the leaves) control is done by hand. *Crocus sativus* is also particularly vulnerable to disease, especially fungi, usually meaning that a non-trivial percentage of the plants must be destroyed prior to harvest. Finally, when the flowers are harvested, the stigmas must be removed from the flowers by hand. Approximately 210,000 flowers are needed to collect one kilogram of stigmas. Some researchers⁵ have estimated that the total process of harvesting, processing and drying one kilogram of saffron involves between 400 and 500 hours of reasonably intense labor.

¹ This excerpt is quoted verbatim from the Central Intelligence Agency web site:

http://www.cia.gov/cia/publications/heroin/flowers_to_heroin.htm

² Other fertilizers used included chicken manure and bat droppings.

³ Source: <http://www.rhodium.ws/chemistry/opium.html>

⁴ Washing encourages spoilage and removes many of the coloring and flavoring agents for which saffron is highly sought after.

⁵ See Douglas, M. 1993. Saffron – *Crocus sativus*. Available on-line from:

<http://www.crop.cri.nz/psp/broadshe/saffron.htm>