MEMORANDUM

Public Works Department

Date: May 23, 2016

To: Tempe City Council

From: Craig Hayton, Parks Manager (350-8205)

Subject: IPM Program
June 2, 2016 Issue Review Session

Integrated Pest Management (IPM) is a decision-making process that utilizes a holistic approach for managing pests, taking into account items such as public health and safety, the environment, and cost. There are four main methods for managing pests under IPM: cultural means, such as proper mowing, fertilization, and irrigation practices; mechanical control, such as removing pests manually; biological controls, such as utilizing lady bugs to control aphids; and chemical, through the use of pesticides, including organic and inorganic herbicides. Rather than having to utilize a one size fits all approach, where a single method is employed every occasion a pest threshold is met, each situation requires a different management strategy. This memo displays how the Public Works Department is retooling its cultural practices and rethinking its chemical approaches under an IPM program.

Retooling Cultural Practices

Cultural practices, or the tasks that maintenance staff performs each day provide the foundation for a proactive pest management strategy: properly scheduled and executed maintenance practices are necessary to ensure healthy landscape environments, founded on proper soil structure and fertility. Tempe's Park Services, in partnership with the Solid Waste section of the Public Works Department has been retooling its cultural practices, through the incorporation of nutrient-rich compost, in an effort to provide a healthier growing environment. As Park staff routinely generates tree cuttings, the material is diverted from the landfill and turned into nutrient-rich compost at our Priest Yard Compost Facility. Once the material has been tested and identified as mature and ready for use, the compost is delivered and incorporated back into our park system; this cultural practice is couple with aerification and irrigation system inspections and repairs to ensure the living infrastructure within the park are receiving the proper care. In the past month, Park staff has incorporated 100 cubic yards of material at Arredondo Park, with another 400 cubic yards scheduled for use in the next few months at other neighborhood parks. It is important to note that the addition of compost into parks is an added task that is currently being absorbed by Parks staff, as it takes approximately 4-5 hours per acre to aerify, apply the compost, and check the irrigation system; Arredondo Park is approximately 4 acres and took 16 labor hours. It would take approximately 10 years to incorporate compost into all of Tempe's parks at the current rate of 500 yards per year. Therefore, if we double the current rate, it would take approximately 5 years.

Rethinking Chemical Approaches

Weeds are simply plants out of place. When choosing to address pests through chemical means, multiple items must be considered. For herbicides, its mode of action is important: whether it kills only the part of the plant sprayed (contact) or if it kills the entire plant, as an herbicide is translocated down through the roots (systemic). Herbicides can also be categorized based on how they are derived: organic herbicides are derived from naturally occurring chemicals, while inorganic herbicides are synthetically derived. Currently, Public Works staff applies the majority of its herbicides to control weeds in two different ways: in decomposed granite areas prior to and after weeds emerge, and along park edges and around trees on actively growing weeds in turf.

In the past year, the Public Works Department piloted an organic herbicide program. As products were researched, specific criteria were identified: a product would be selected based on its impact on public health and safety, its effect on the environment, and how much it cost. A quick survey of the organic herbicides available in the market today reveal three types, which are all contact herbicides, commonly grouped by active ingredient: oil (typically clove), acid (acetic, which is vinegar), and ammonium based (herbicidal soaps). One current inorganic option for general weed control, RoundUp, costs $.67 per mixed gallon in product to apply, while the organic options range in price from $3.50 to $25 per mixed gallon.

We selected the clove oil product Weed Zap, due to the product's low toxicity, reasonable price, and generally positive research test results on broadleaf weeds; it is important to note that none of the organic herbicides researched performed well on grassy weeds. The organic herbicide was utilized in six of Tempe's Right of Way areas, along with two park sites: Kiwanis Park and Tempe Beach Park. Results of the organic herbicide pilot have been mixed: immature weeds are controlled easily, but mature weeds, though initially stunted, quickly recover, requiring manual removal. Therefore, to increase the control of broadleaf weeds by organic herbicides, more frequent site visits and applications would be required; weeds would need to be treated in the immature stages of development.

IPM Goals

There are several goals that have emerged from the IPM program's incorporation of compost and the organic herbicide pilot. First, the best offense is always a good defense: we must emphasize overall landscape health. This is accomplished through proper cultural practices, of which the incorporation of nutrient-rich compost is key, not just for soil structure, but for overall plant health. Healthier turf will be more able to out-compete weeds, reducing the need for chemical controls. Second, while the initial results of the organic herbicide pilot were mixed, as time progresses, more organic options will become available, ones that will likely be less expensive and more effective than the current options. Therefore, Public Works will continue to monitor the organic market for new and improved products. Finally, Public Works is formalizing an IPM program through the creation of standard operating procedures, as well as best practices, identifying locations where inorganic herbicides should not be used, such as playgrounds and dog parks. Through the IPM program, Public Works is actively identifying areas to either reduce or eliminate inorganic herbicides in Tempe's parks.