Award Category: Regional IPM Program
Nominee Name: Alexandre V. Latchininsky
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Supporting Document: SUBMITTED
Vita:
Improving economic benefits related to IPM adoption: Checked
Reducing potential human health risks: Checked
Minimizing adverse environmental effects: Checked

Brief Summary of Nominee's or Program's Accomplishments (500 words or less):
Dr. Alexander Latchininsky's accomplishments in developing and implementing IPM strategies for rangeland grasshoppers in the western United States are worthy of recognition by his peers. His program has been structured around prevention (via cultural management, such as grazing regimes), intervention (via hotspot detection and control, applications of remote sensing and GIS, and publication of grasshopper identification and management guides), and suppression (via Reduced Agent-Area Treatments, RAATs, and decision-support tools including the widely adopted Case-based Rangeland Management Advisor, CARMA). The grasshopper IPM program was in development at the University of Wyoming when Dr. Latchininsky was hired, but he has played the central role in integrating the elements, shaping policy, refining methods, and developing tactics. Perhaps most vitally he, has not just 'talked the talk' of IPM but he has made it possible for agriculture to 'walk the walk'. That is, Dr. Latchininsky has packaged and delivered the entire system using highly accessible publications and a train-the-trainers approach to workshops such that ranchers, land/resource management agencies (e.g., BLM and USFS) and pest management agencies (e.g., USDA-APHIS and state departments of agriculture across the western US) have widely adopted and implement the system. There are, in particular, three aspects of Dr. Latchininsky's program that should be recognized. FIRST, he was instrumental in the development and refinement of RAATs, which dramatically reduces the environmental and economic costs of insecticidal treatments by applying low rates of chemicals in swaths with intervening untreated areas. This approach differs dramatically from the conventional method of blanketing rangeland in insecticides to control grasshoppers. The new approach consistently yields 85-95% control, while the traditional method provided 95-100% control. RAATs works through both exploiting the movement and feeding behaviors of grasshoppers (considerable, ethological and ecological research went into the method) and conserving natural biological control agents. This approach has been so successful that it has become the standard tactic of land/pest managers across the western US—and it is the preferred alternative in the EIS that governs the USDA's practices. SECOND, Dr. Latchininsky worked extensively in collaboratively developing and refining CARMA, which has become widely adopted and continues to be extended throughout the West via state-specific modules. The software integrates case- and rule-based reasoning in an expert system, and its interface is remarkably accessible to naïve users. For all of its elegance and apparent simplicity, CARMA provides recommendations that are indistinguishable from those of human experts. THIRD, Dr. Latchininsky has developed a series of highly usable publications for pest managers, including: Pest Grasshoppers of the West: Identification and Management poster

(UWCES B-1171), Mormon Cricket Biology and Management poster (UWCES B-1191), Field Guide of Common Wyoming Grasshoppers (UW CES Bulletin B-1161), Grasshopper Management Square Foot Job Aid (UWCES MP-123), Aerial RAATs and ATV-RAATs brochures (UWCES MP-95). These documents complement a highly refined and effective workshop program in which he is able to train local/regional pest managers in the elements of grasshopper IPM—and then these individuals become trainers for others in the field.

Describe the goals of the program being nominated; why was the program conducted? What condition does this activity address? (250 words or less):

The initial motivation of Dr. Latchininsky's IPM program was economic—the federal government ended the subsidy for grasshopper control on western rangelands and ranchers needed methods that were much less costly. In effect, Dr. Latchininsky has replaced monetary subsidies with knowledge. His goals are to manage rangeland grasshopper populations at the lowest possible cost to economics, environment, and human health (he's shown that these factors converge). He has integrated cultural (grazing) methods developed by USDA-APHIS scientists into the IPM program. In terms of his original work, a guiding principle is early monitoring and intervention, suppressing hot-spots before they irrupt into outbreaks. This requires pest/land managers to understand and implement survey methods, which have been made highly efficient via remote sensing and GIS analyses that allow individuals to focus their efforts in areas with the highest probability of infestations. If early action is not sufficient, then switching to suppression is necessary—and the development of RAATs (which has been optimized for both land-based and aerially application methods) has drastically reduced environmental and economic impacts. Key to the success of the program is Dr. Latchininsky's educational efforts which have fostered a reconceptualization of the goals of grasshopper management. Rather than a 'scorched earth' ideal of zero grasshoppers, he has convinced pest/land managers that a low density of these native insects on the range is desirable. This background population supports native predators and parasites that, in most years, maintain grasshoppers at economically harmless densities—and the biodiversity of the native grasslands is sustained.

Describe the level of integration across pests, systems and/or disciplines that was involved. (250 words or less):

With regard to PESTS, grasshoppers are recurrent rangeland pests in the 17 western states, where they destroy 25% of rangeland forage at an estimated cost of $1 billion/year. Outbreaks encompass millions of acres and are composed of 20 or more species. However, the vast majority of grasshopper species are not pests; perhaps 15 of the >200 rangeland species can cause serious damage (some species are beneficial in that they consume weeds). In terms of SYSTEMS, rangeland is a complex agro-ecosystem dominated by native plants. Producers have diverse objectives, including: livestock grazing , wildlife production (for hunting), hydrological services, and perhaps even carbon sequestration (discussions are underway). Moreover, grasshopper outbreaks originating on rangeland can move into adjoining cropland, generating complex economic considerations (suppressing grasshoppers on relatively low-value rangeland can have enormous benefits in avoiding damage to high-value crops). With respect to DISCIPLINES, Dr. Latchininsky has developed skills and collaborative projects with geographers (e.g., the application of remote sensing to detect forage loss as an indicator of grasshopper infestation and the use of GIS to find spatial patterns in the historic distribution of grasshopper outbreaks so as to refine current survey programs), soil scientists (e.g., one of the best predictors of an area's propensity to support high densities of grasshoppers is the underlying soil which plays a crucial role in grasshopper egg survival/development and plant productivity/stress), range management scientists (e.g., quantifying forage condition), and agricultural economics (e.g., determining financial returns of various tactics in the short- and long-term).

Describe the team building process; how did the program being nominated get partners involved? Education and awareness are essential in an IPM program. (250 words or less):
A specific example of team-building is the best way to address this question. The 2009 survey showed that Wyoming was facing widespread, severe grasshopper infestations. Dr. Latchininsky coordinated an educational program with the Wyoming Department of Agriculture, USDA-APHIS-PPQ, and County Weed & Pest Supervisors. He organized public meetings in the 17 affected counties during a 5-month period. More than 600 people attended the workshops, during which Dr. Latchininsky and his collaborators gave presentations on grasshopper biology, ecology, and IPM practices, distributed informational brochures on management options, provided job aids for determining grasshopper densities and species, and demonstrated CARMA. As predicted, grasshopper outbreak in Wyoming was very serious in 2010, the worst in about 25 years. The efficacy of Dr. Latchininsky's efforts to build a state-wide 'team' of pest managers with a shared foundation of essential knowledge is addressed in the next question. This is a good place to note that Dr. Latchininsky's expertise is in high demand internationally. He has worked extensively with the UN-FAO to design and implement locust IPM programs throughout central Asia, where his Russian-speaking abilities have been critical. He has also collaborated with the FAO to develop an IPM training program for desert locust management in West Africa, where his fluency in French proved essential. The course was delivered to 21 national trainers—and then an educational "cascade delivered it to >600 local specialists in 10 countries. The training emphasized preventive and environmentally less hazardous management options including barrier treatments, which is an analog of RAATs.

What outcome describes the greatest success of the program?:
Consider the summer of 2010. Grasshopper treatments by the USDA covered 1,257,180 ac in Arizona, California, Idaho, Montana, North Dakota, Oregon, South Dakota, Utah and Wyoming. In Wyoming, population densities between 15 and 85 grasshoppers per square yard covered over 2,908,000 ac of rangeland (much of this was treated by private landowners, as noted above). The USDA-APHIS-PPQ applied insecticide to 666,606 ac using the RAAT method. The average pest density prior to treatments was 20 grasshoppers per square yard, and after treatments the populations averaged 2 per square yard—a 90% reduction which left behind sufficient numbers to sustain the natural enemy populations. The economic savings were about $2.5 million, which is quite impressive—and when added to the savings to private landowners in Wyoming, Dr. Latchininsky's IPM program saved western agriculture more than $11 million in a single year (not including what was saved in private programs in other western states). However, we should also consider the reduction in environmental costs. Based on reasonable extrapolation from available data, compared to conventional methods the RAATs approach reduced the insecticide load in the environment of the western states by nearly 600 tons (about 88 tons less diflubenzuron and 500 tons less carbaryl). The reduction in risk to human health over an area of nearly 10,000 square miles was surely commensurate with this dramatic improvement in pest management.

Provide evidence of change in knowledge, behavior or condition as a result of the program/individual. (250 words or less):
One of the core elements of Dr. Latchininsky's IPM program is RAATs, which reduces the costs of grasshopper control by 50 to 60%. For example, in 2003, about 400,000 acres of rangeland were protected from grasshoppers in Niobrara County (Wyoming), saving the local agriculturists over half a million dollars. And in Nebraska, 63,000 acres were protected by RAATs in 2007, with commensurate savings (similar cases have occurred in 10 western states). The results of Dr. Latchininsky's team-building efforts in anticipating of the 2010 grasshopper outbreak are remarkable. In that year,

5,903,616 acres were protected in Wyoming using the RAATs method. About 4.7 million acres out of 5.9 million were treated by private landowners. Had they used the traditional, blanket application of insecticides at conventional rates, the cost would have been $3.70/ac, so the entire program would have cost $17.4 million. However, because of Dr. Latchininsky's work and educational efforts, ranchers applied insecticide at half of the maximum labeled rate, and the chemical was applied to only 50% of the infested area (i.e., every other swath was skipped). The RAATs treatments reduced pest densities below the economic threshold, at a cost of only $8.7 million. So as a direct result of Dr. Latchininsky's IPM program, producers saved $8.7 million and used just 25% of the insecticide (i.e., half the rate applied to half the area) that would have been used in a conventional treatment. This allowed Wyoming ranchers to survive the unprecedented pest outbreak and maintain the viability of their operations.

Who or what should receive the most credit for the success of this program? (250 words or less):
The rangeland grasshopper IPM program at the University of Wyoming is rooted in the initial research on the RAATs method conducted in 1995. A continuous and overlapping series of undergraduate technicians, graduate students, research associates, post-docs, and faculty refined this method and added the other, critical elements of the venture (i.e., remote sensing and GIS methods, extension and education materials, survey techniques, and the decision-support system). On another level, the Wyoming Weed & Pest Districts, the Wyoming Department of Agriculture, other state departments of agriculture, federal land management agencies, and USDA-APHIS-PPQ offices across the West deservedly share in program's success. And it is also appropriate to recognize the many ranchers who were willing and able to radically rethink the goals of pest management and the strategies for achieving these outcomes. In the last decade, Dr. Latchininsky has played the central and catalytic role in this effort. As such, he is the best person to receive the credit (and the award) for the venture. Given his interpersonal and team-building skills, there is no doubt that those who came before him and currently work with him will celebrate his being recognized in this matter—and he will most assuredly share the credit with his valued colleagues.

If selected, suggested Citation for Award Certificate (40 words or less):
Dr. Latchininsky's intellectual rigor, conceptual creativity, practical skills, educational abilities, cooperative spirit, and leadership capacity combined to create a rangeland grasshopper IPM program that saved tens of millions of dollars and hundreds of tons of insecticide across the western US.