Grasshoppers

Orthoptera: Acrididae

Plains Lubber

Pictured grasshoppers

Great crested grasshopper

Snakeweed grasshoppers

Primary Pest Grasshoppers

- Migratory grasshopper
- Twostriped grasshopper
- Differential grasshopper
- Redlegged grasshopper
- Clearwinged grasshopper

Twostriped Grasshopper, *Melanoplus bivittatus*

Redlegged Grasshopper, *Melanoplus femurrubrum*

Differential Grasshopper, *Melanoplus differentialis*

Migratory Grasshopper, *Melanoplus sanguinipes*

Clearwinged Grasshopper

Camnula pellucida

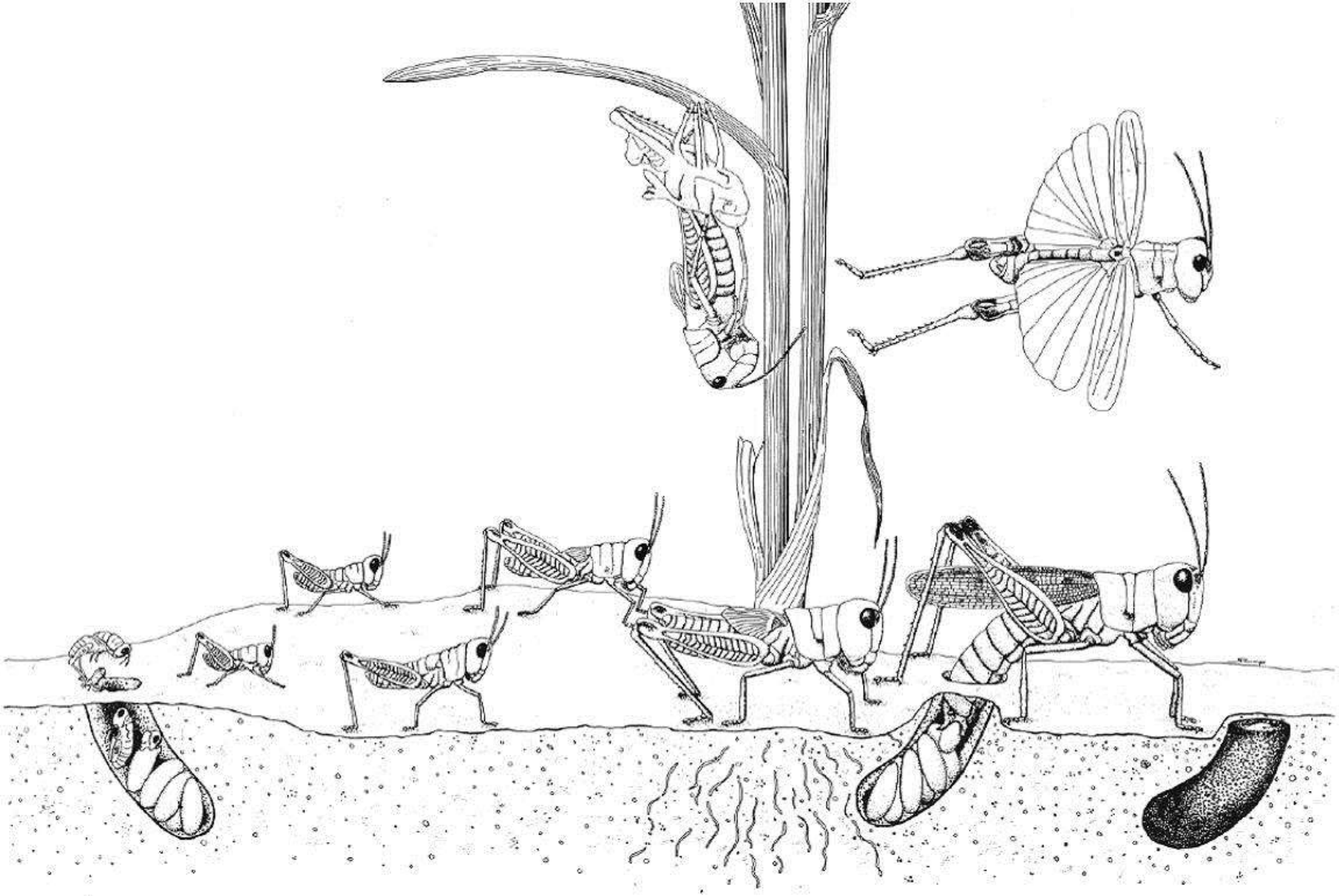
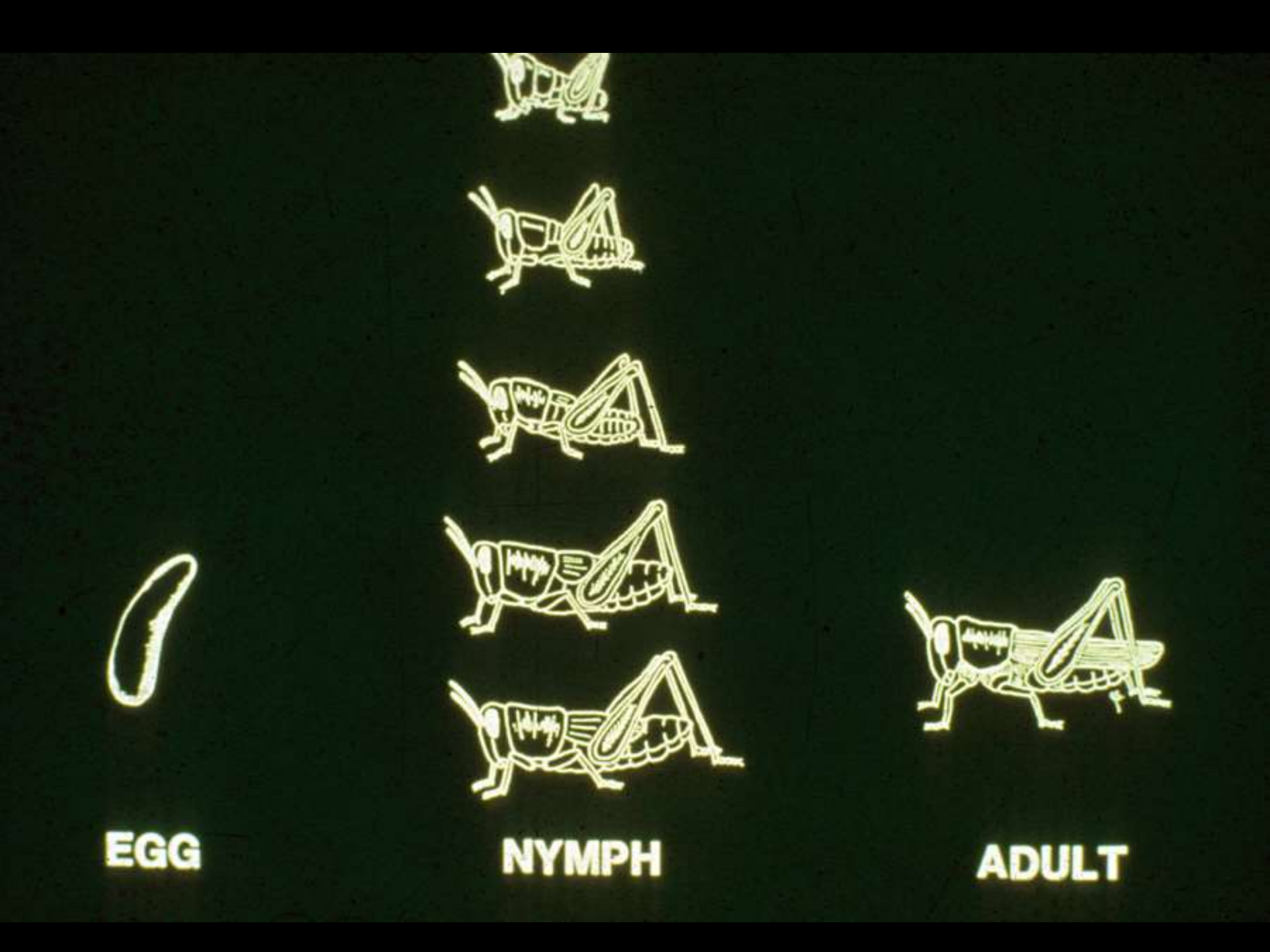


Diagram courtesy of Alexandre Latchininsky, University of Wyoming


EGG
NYMPH
ADULT

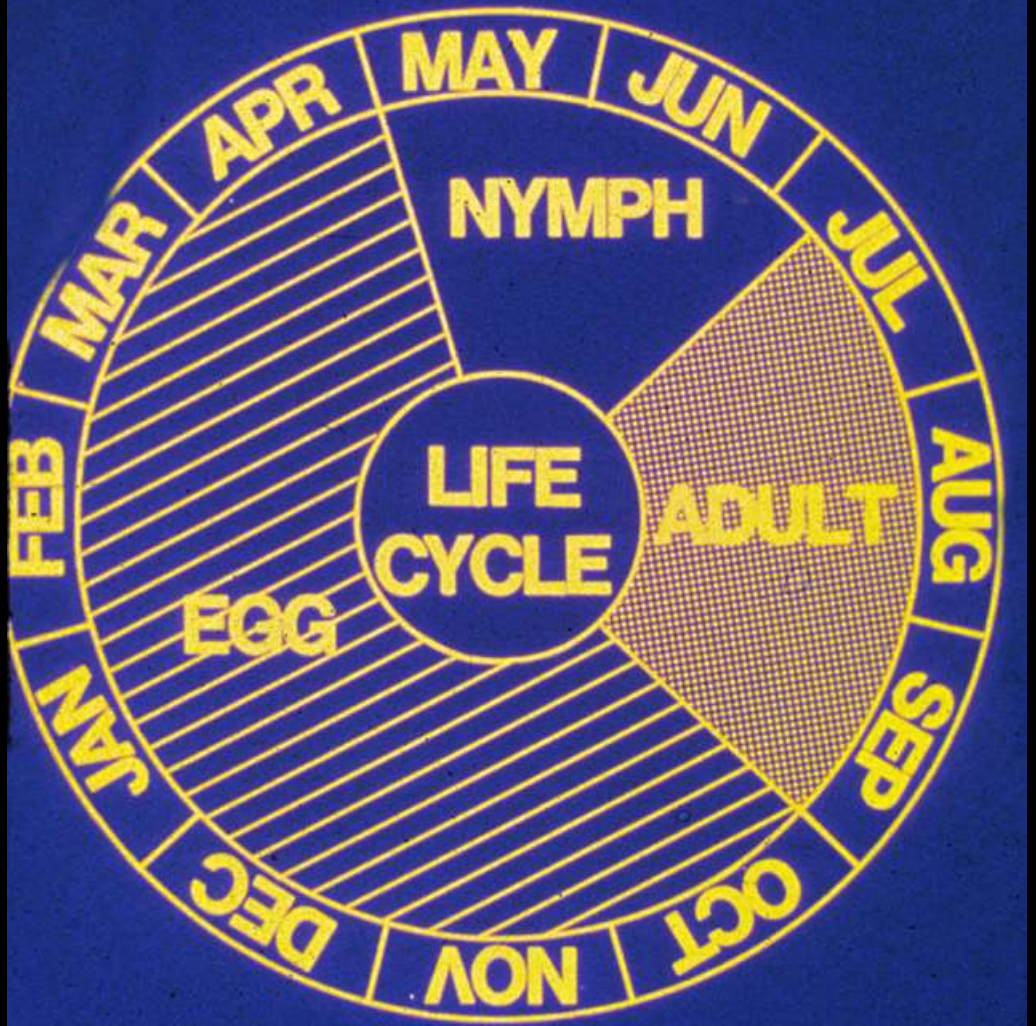
Photograph courtesy of Jean-Francoise Duranton, CIRAD

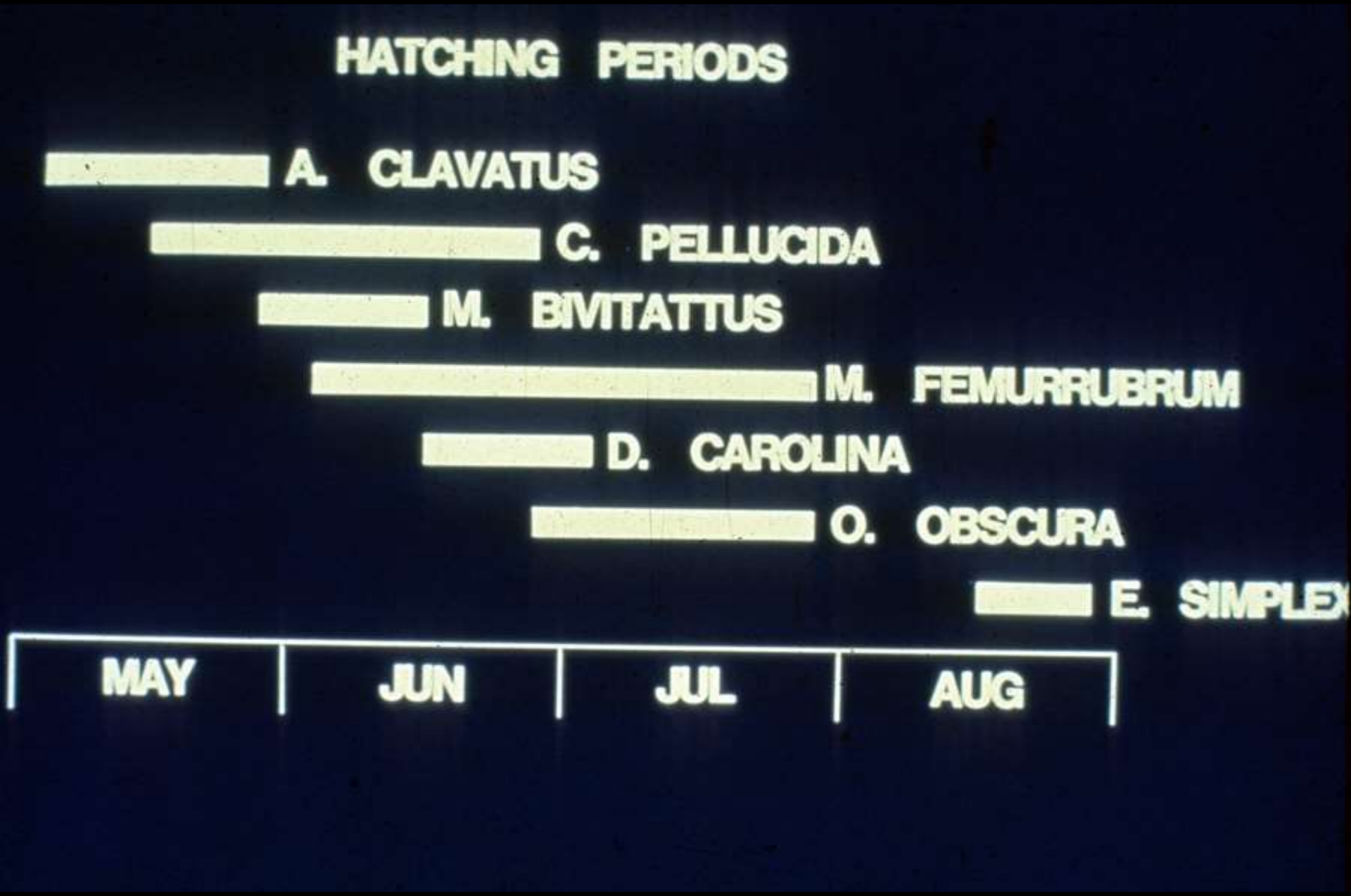
Grasshoppers lay pods of eggs below ground

Grasshopper Egg Pods

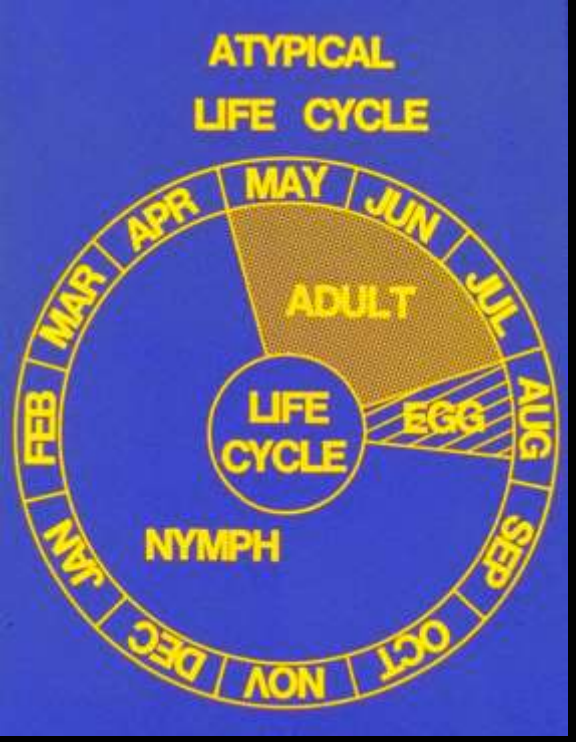
Grasshopper Nymphs

TYPICAL LIFE CYCLE




HATCHING PERIODS
A. CLAVATUS
C. PELLUCIDA
M. BIVITATTUS
M. FEMURRUBRUM
D. CAROLINA
O. OBSCURA
E. SIMPLEX
MAY
JUN
JUL
AUG

Some grasshoppers found in winter and early spring



Velvet-striped grasshopper – a common spring species

Grasshopper Controls

- Weather (rainfall mediated primarily)
- Natural enemies
  - Predators, diseases
- Treatment of breeding areas
- Biological controls
- Row covers

Temperature and rainfall are important mortality factors

Grasshoppers and Rainfall

Moisture prior to egg hatch generally aids survival

- Newly hatched young need succulent foliage

Moisture after egg hatch generally reduces problems

- Assists spread of diseases
- Allows for plenty of food, reducing competition for rangeland and crops

Grasshopper predators

Robber Flies

Larvae of many blister beetles develop on grasshopper egg pods

Blister beetle larva

Fungus-killed Grasshoppers

Pathogen: *Entomophthora grylli*

***Mermis nigrescens*, a nematode parasite of grasshoppers**

Differential grasshopper killed by *Mermis nigriscens*

Grasshoppers as coyote roughage

Grasshopper Control

Treat sites where grasshopper eggs hatch and early stages develop – breeding sites

Breeding sites – Dry, undisturbed areas

Grasshopper Controls

- Target younger stages
- Sprays
  - **Dimilin, Carbaryl, Orthene, Permethrin**
  - **Addition of vegetable oil improves performance (more palatable)**
  - **Can apply to strips (1/3 to ½ total area)**
- Baits
  - **Insecticide on food based bait**

Colorado State University

Extension

Grasshopper Control in Gardens and Small Acreages

Fact Sheet No. **5.536** Insect Series | **Home and Garden**

by W.S. Cranshaw and R. Hammon*

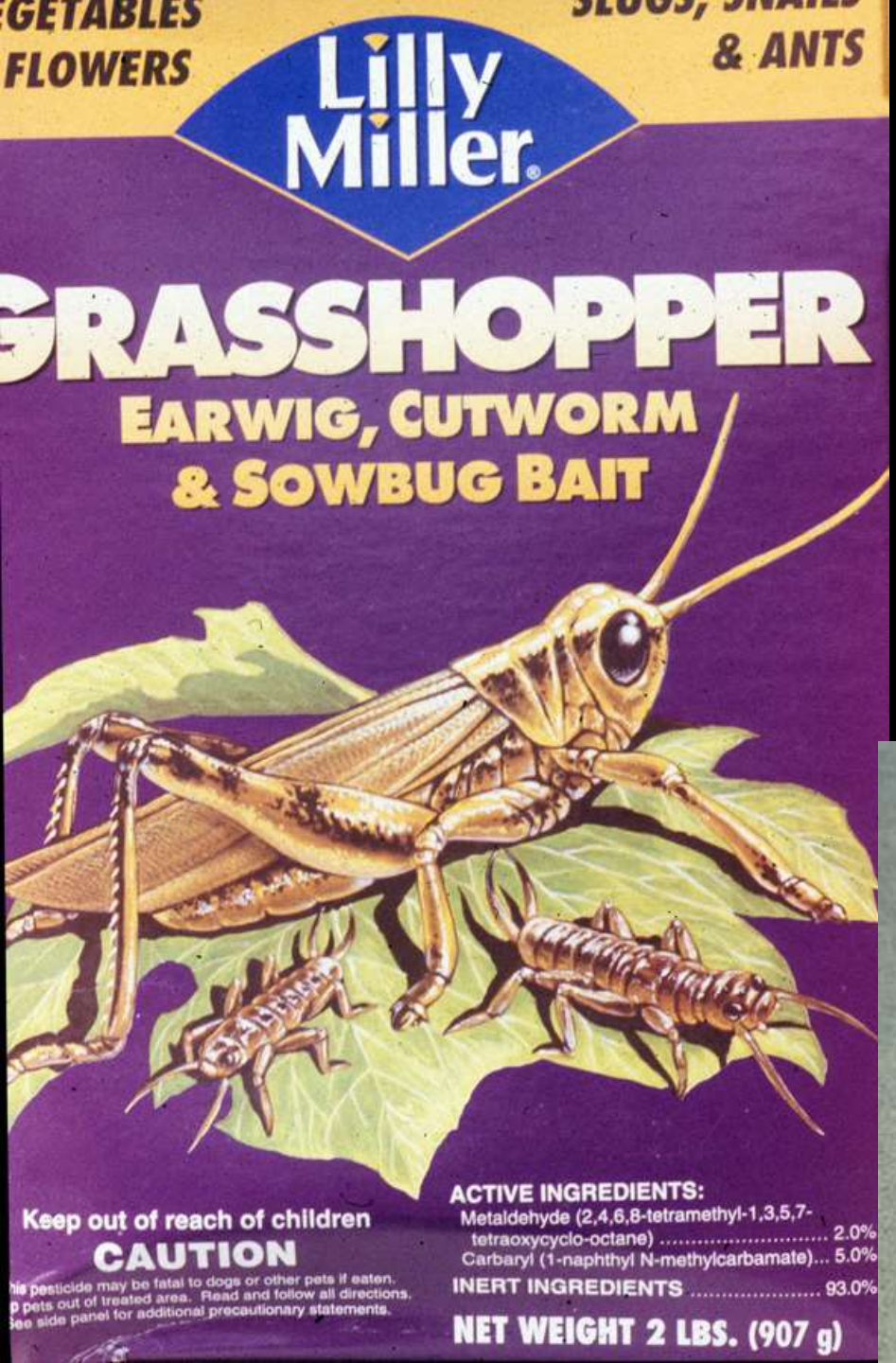
Grasshoppers can be the most noticeable and damaging insects to yards and fields. They also are among those most difficult to control, since they are highly mobile. For many reasons, grasshopper populations fluctuate greatly from year to year, and may cause serious damage during periodic outbreaks. Problems tend to increase beginning in early summer and can persist until hard frosts.

late-spring, varying with soil temperatures. At egg hatch the tiny first stage nymphs move to the surface and seek tender foliage on which to feed. The first few days are critical to survival. Adverse weather or absence of suitable foods can cause high mortality. Surviving grasshoppers continue to develop over the next several weeks, usually molting through five or six stages, before ultimately reaching the adult form.

Quick Facts

- Grasshoppers are the most difficult insect to control because they are highly mobile.
- All grasshoppers lay their eggs in soil.

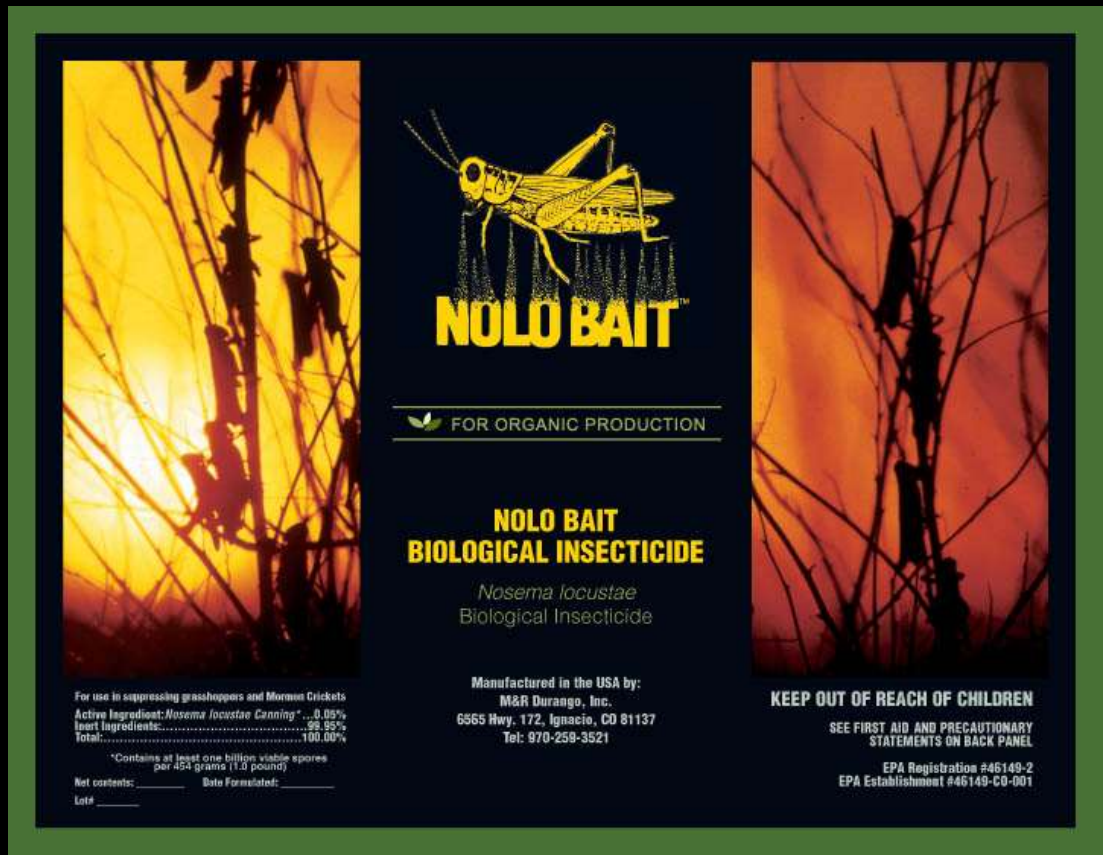
Baits for grasshopper control



ECO-BRAN
PEACOCK
INDUSTRIES
BRAN FOR GRASSHOPPERS
GRASSHOPPER INSECTICIDE
AGRICULTURAL
WHEAT BRAN INSECTICIDE
Guarantee: Carbaryl 2%
READ LABEL BEFORE USE
KEEP OUT OF REACH OF CHILDREN
CAUTION POISON
NET CONTENTS 20 KG.
GROUP 1A INSECTICIDE
ECO-BRAN 20 kg

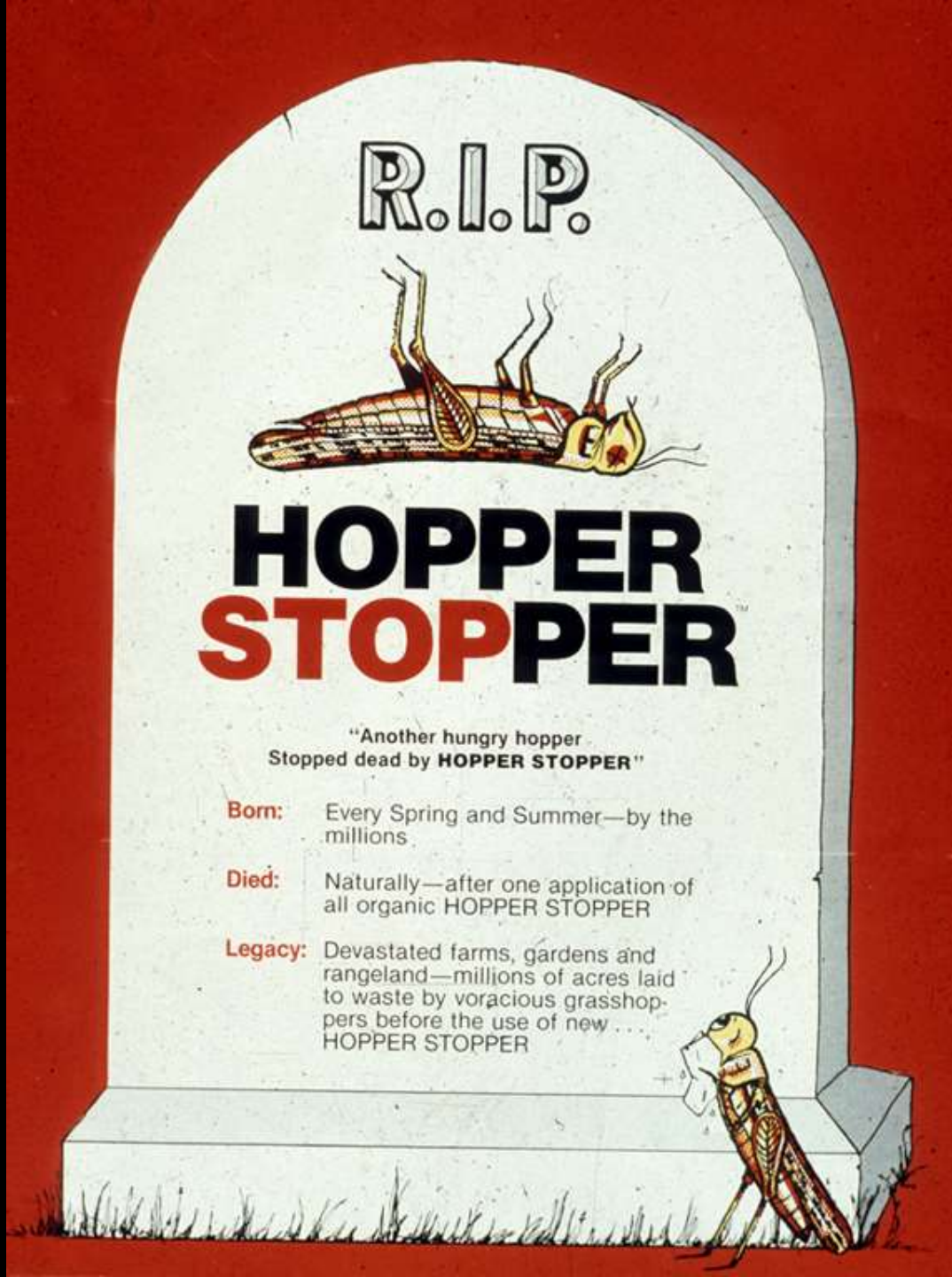
ECOBRAN
Bran for GRASSHOPPERS
CAUTION - KEEP OUT OF REACH OF CHILDREN
NOTICE OF WARRANTY
Peacock Industries
Hague, SK, Canada
1-416-634-2359

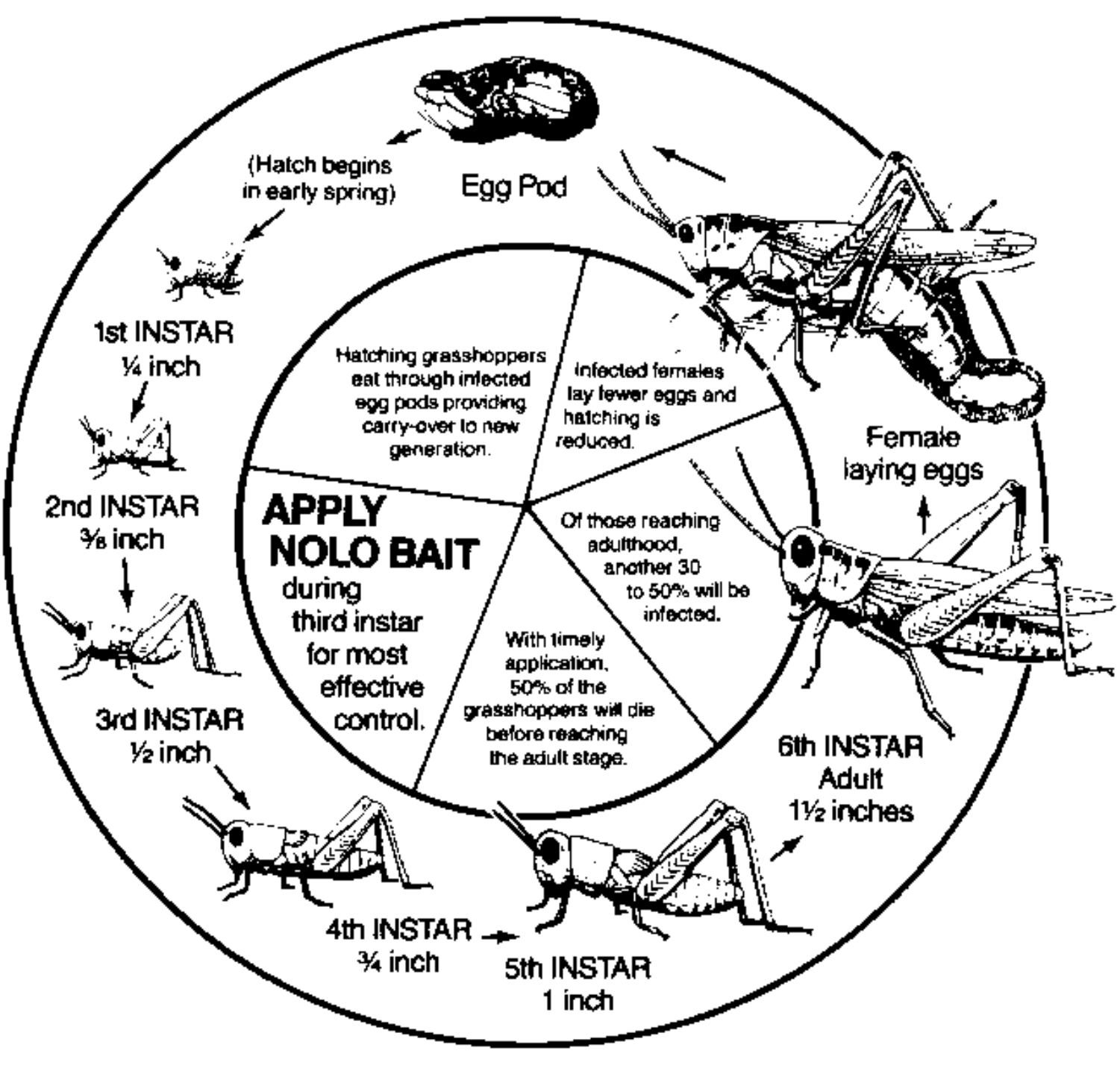
Nosema locustae



***Nosema locustae*, a protozoan disease of some grasshoppers.**

Trade names include Semaspore and NoLo bait.




(Hatch begins in early spring)
Egg Pod
1st INSTAR
¼ inch
2nd INSTAR
⅜ inch
3rd INSTAR
½ inch
4th INSTAR
¾ inch
5th INSTAR
1 inch
6th INSTAR
Adult
1½ inches
Female laying eggs
Hatching grasshoppers eat through infected egg pods providing carry-over to new generation.
Infected females lay fewer eggs and hatching is reduced.
Of those reaching adulthood, another 30 to 50% will be infected.
With timely application, 50% of the grasshoppers will die before reaching the adult stage.
APPLY NOLO BAIT during third instar for most effective control.

Poultry as biological controls for grasshoppers

Grasshoppers as coyote roughage

Grasshoppers for sale in market. Oaxaca, Mexico

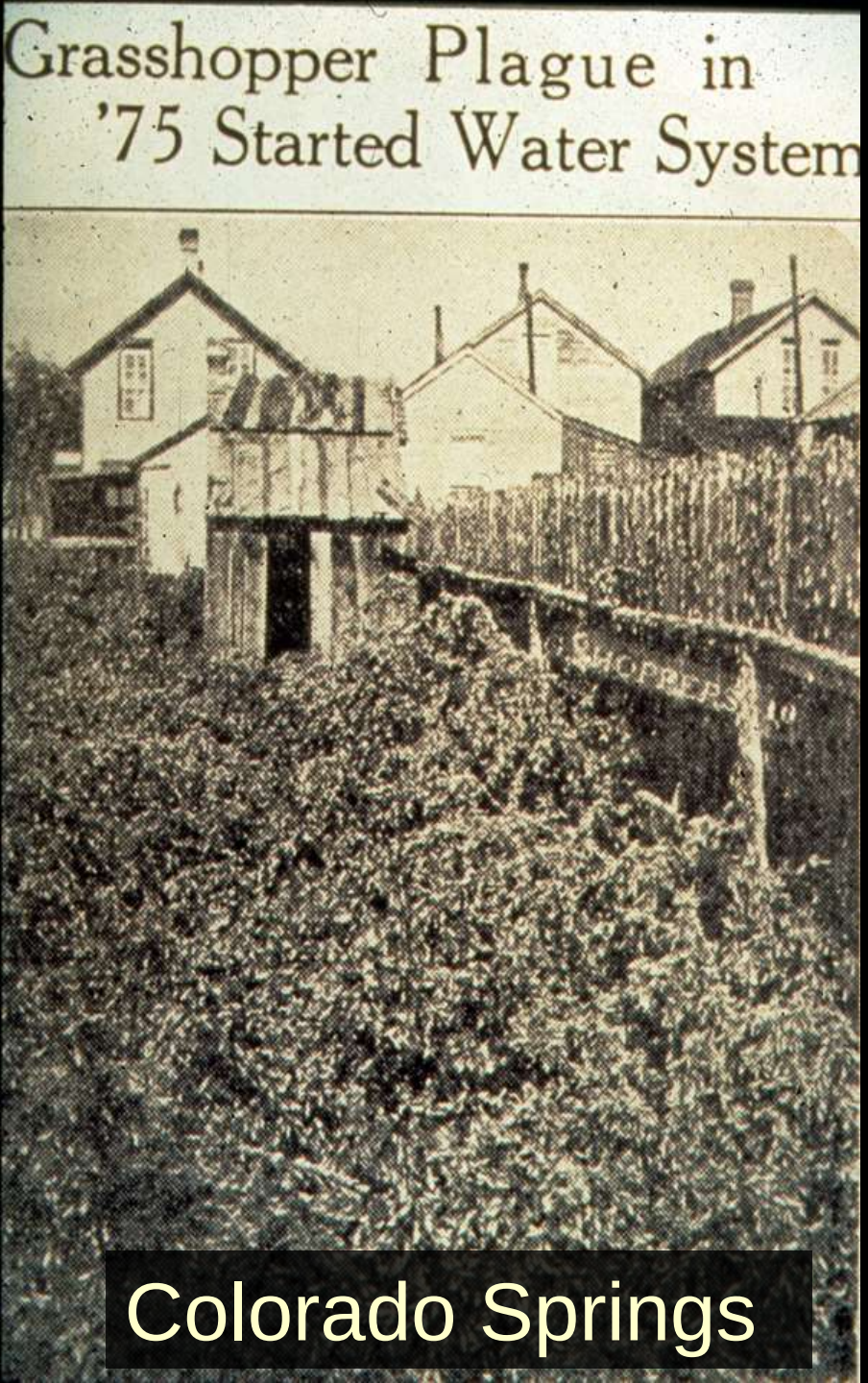
***Chapaulines* – an appetizer served with guacamole**

Rocky Mountain Locust

Melanoplus spretus

SCHOOL SERIES
Outline Map
of the
UNITED STATES
With Rivers and Mountains
COPYRIGHT
AMERICAN MAP CO., INC.

Rocky Mountain Locust, *Melanoplus spretus*



Colorado Springs

Albert's Swarm - 1875

Greatest concentration of animals ever recorded

198,000 square miles

12.5 trillion insects

Biomass 27.5 million tons

Roughly equaling the combined area of Connecticut, Delaware, Maine, Maryland, Massachusetts, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island and Vermont.

Downtown Colorado Springs, 1875

On the 1875 Locust Plague Event in Colorado Springs

Reported in the *Gering Citizen*, by M. Timothy Nolting
August 1, 2013

"The locusts also invaded parts of Colorado. Mr. H. McAllister of Colorado Springs recorded his own observations: "In 1875, early in August, a swarm suddenly came down.

The insects came with the wind, and alighted in a rain. The ground was literally covered two and three inches deep, and glittered "as a new dollar" with the active multitude. In alighting, they circle in myriads about you, beating against everything animate or inanimate, driving into open doors and windows, heaping about your feet and around your buildings, their jaws constantly at work biting and testing all things in seeking what they can devour.

The noise their myriad jaws make when engaged in their work of destruction can be realized by anyone who has 'fought' a prairie fire or heard the flames passing along before a brisk wind -the low crackling and rasping; the general effect of the two sounds is very much the same."

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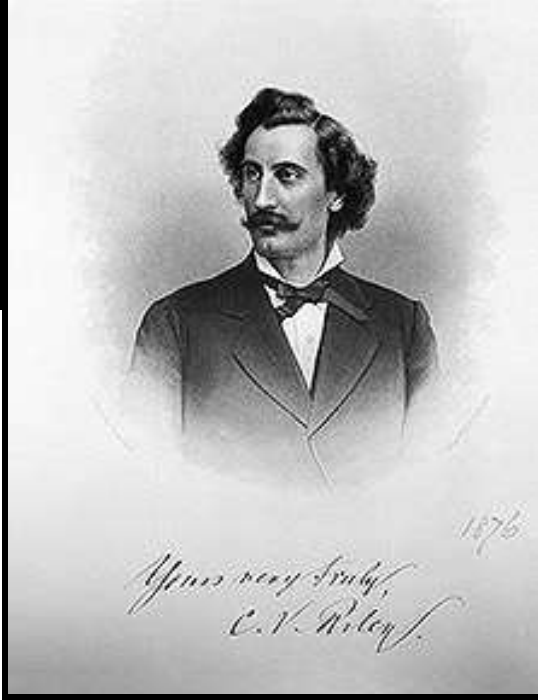
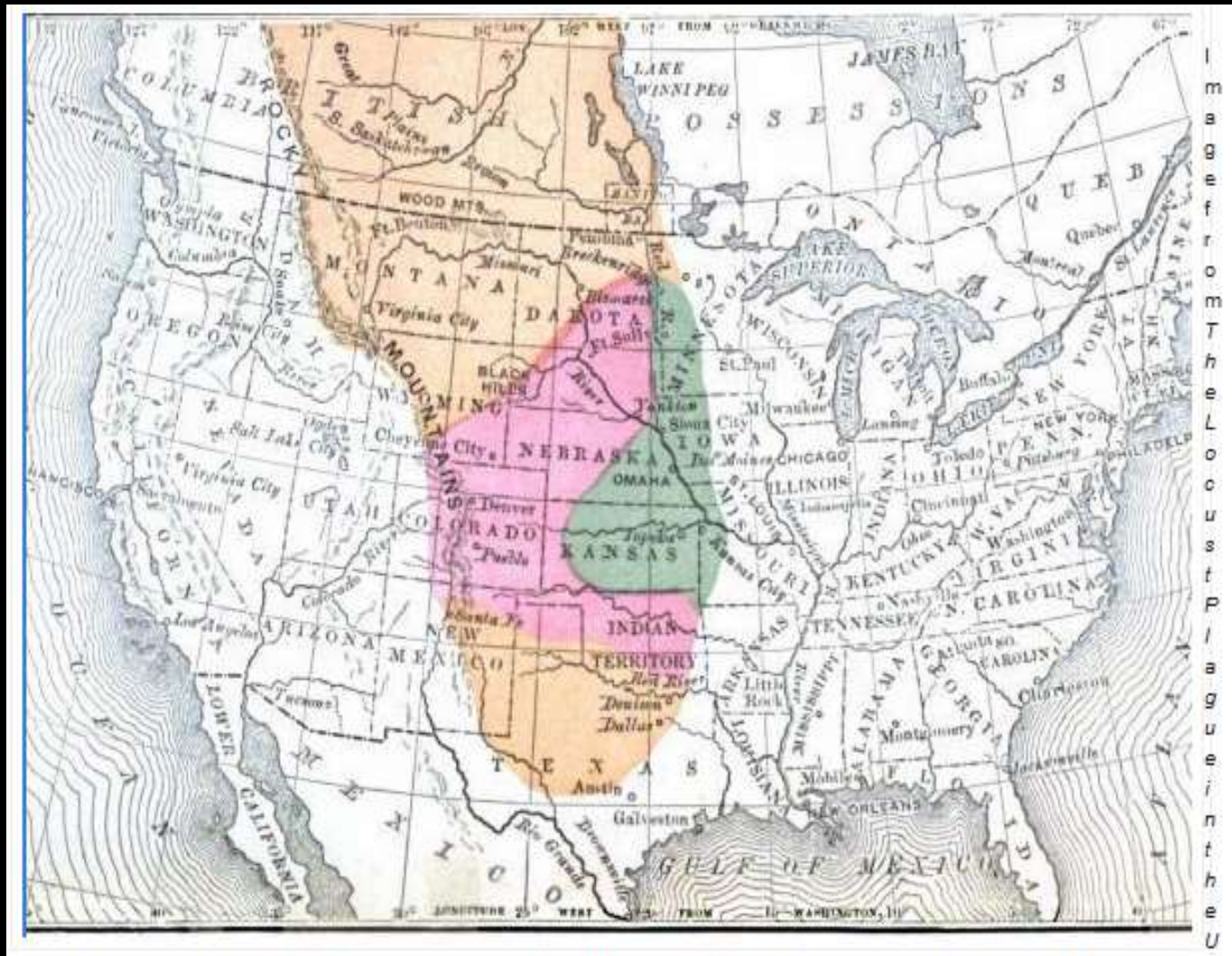
C.V. Riley

Appointed Chairman of the Grasshopper Commission – First Scientist hired by the US Government





nited States, by CV Riley, 1877. The orange color shows the full extent of infestation. The green area shows where the damage was worst, the pink where damage was less due to lower human habitation.

Mystery of the Rocky Mountain Locust

1870's →Darkening the skies across the western United States

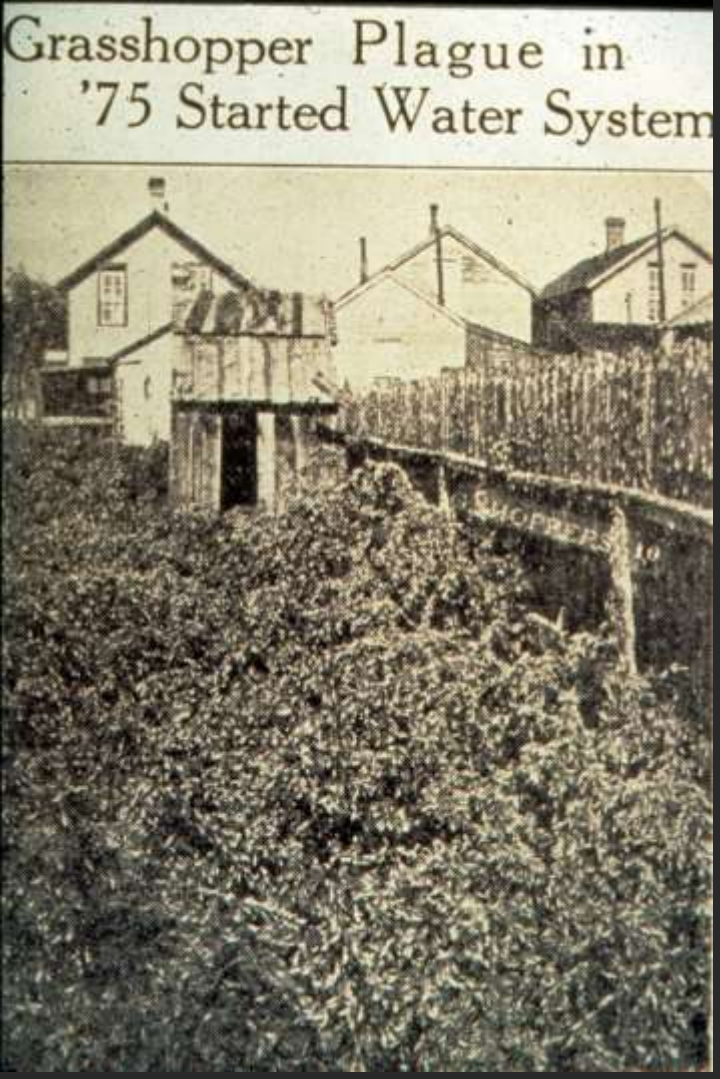
1902 → The last living specimen was collected

The only pest insect in history known to have gone extinct!

High Plains Grasshopper

Dissosteira longipennis

Outbreak species during the 1930's



Rocky Mountain Locust, Melanoplus spretus

- Status, Extinct

High Plains Grasshopper, Dissosteira longipennis

Status – Reverted to minor status