

Frequency of nonmeiocytes was not affected. Therefore, the meiotic index was significantly reduced (see table).

The majority of the primary spermatocytes in control male progeny had 15 bivalent chromosomes. In the progeny exposed to 100 ppm of NSKE, the primary spermatocytes had reduced numbers of homologs. Of 225 cells examined at diakinesis, 28% contained fewer bivalents: 1% of the cells had 11 bivalents, 3% had 12 bivalents, 5% had 13 bivalents, and 19% had

14 bivalents. The reduction in chromosome number was due to centric fusions, and stickiness of bivalents was a common feature (Fig. 1a, e, f). At metaphase I, one or two autosomes lagged behind the equatorial clumping (Fig. 1b, c).

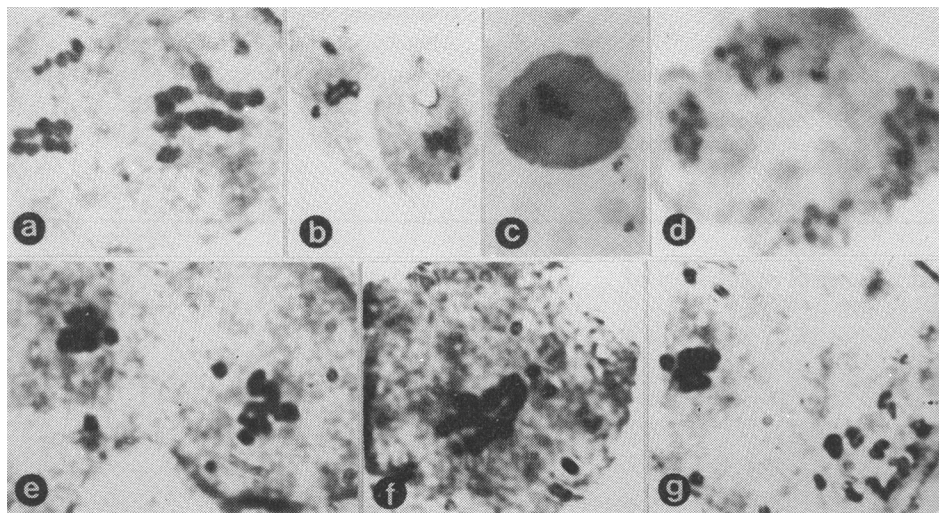
Secondary spermatocytes in the progeny exposed to NSKE also had fewer univalents than those in the control progeny. Some univalents were elongated. Anomalies were detected in late telophase II cells - the tetrads failed to undergo complete cytokinesis (Fig. 1d). The significance of these abnormalities is not known.

Chromosomal defects also occurred in primary and secondary spermatocytes of progeny exposed to 500 ppm of NSKE. More centric fusions resulted in 39% abnormal chromosome counts during diakinesis: 2% had 9 bivalents, 2% had 10 bivalents, 4% had 11 bivalents, 3% had 12 bivalents, 14% had 13 bivalents,

Mean frequencies and indices of BPH males in first generation progeny collected from NSKE-treated and untreated rice plants.^a IIRRI, 1987.

Treatment (ppm NSKE)	Meiocytes (no.)	Nonmeiocytes (no.)	Meiotic index
100	82.1 b	220.6 a	0.278 b
500	80.6 b	273.3 a	0.224 b
0 (control)	232.1 a	374.6 a	0.384 a

^aIn a column, means followed by a common letter are not significantly different at 1% level by *t*-test. Based on 10 replications, 1 male/replication.



Spermatocytes of first-generation male BPH progeny collected from rice plants sprayed with 100 ppm (a-f) and 500 ppm (g) of NSKE. Magnification, 1000× (oil immersion).

and 14% had 14 bivalents. The fused homologs were highly heterochromatic.

In addition to these abnormalities, 5 cells contained 18 relatively smaller chromosomes, possibly as a result of fragmentation. A few cells possessed elongated chromosomes. Also, there

were unique localized clumpings at the lower polar ends of primary spermatocytes (Fig. 1g).

The chromosomal abnormalities led to inviability of gametes and reduced the insemination potential of first generation male progeny exposed to NSKE. □

Outbreak of whitebacked planthopper (WBPH) near Annamalainagar, South India

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WBPH *Sogatella furcifera* (Horvath) is a relatively lesser known insect pest compared with brown planthopper (BPH) in this part of Tamil Nadu. But in December 1986, a severe outbreak of WBPH occurred in a village 3 km from Annamalainagar. It affected about 50 ha of transplanted IR20 and IR50, the

latter being more seriously affected. Early planted fields were the worst affected. We observed about 250-300 WBPH nymphs and adults/hill and 40-45 BPH/hill. The WBPH were mostly macropterous. They crowded on leaf blades also.

The reasons for the flare-up of planthoppers, especially WBPH, could be either failure of the farmers to notice them on time or favorable weather conditions for insect buildup.

The input of pesticides has always been minimal and possibly never exceeded two applications of organophosphates. □

Effect of temperature, sustenance, and mating on rice armyworm reproduction

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Adults of rice armyworm *Mythimna separata* (Wlk.) from a mass culture raised in the laboratory were used in 3 sets of experiments conducted at 15, 18, 20, 25, and 30 °C temperatures and 55-80% relative humidity in BOD incubators. For each set, 10 pairs (female + male) of adults were tested