This thesis is devoted to a study of a thin layer of noncollinear antiferromagnetic metal Mn_3GaN on a MgO substrate using magneto-optical pump and probe technique. We found that after the impact of a femtosecond laser pulse, Mn_3GaN exhibits very similar behavior to the analogous noncollinear antiferromagnet Mn_3NiN. Specifically, we observed a magneto-optical signal whose magnitude depends strongly on the orientation of the linear polarization of the excitation pulses. We interpret this phenomenon as a consequence of the action of ultrashort torques on individual spins due to anisotropic absorption of the excitation laser pulse by individual manganese, which deforms the corresponding spin structure. Thus, the existence of this phenomenon in Mn_3NiN and Mn_3GaN, which have different spin configurations, points to its universal character. In the studied Mn_3GaN, this effect is evident even at room temperature, which, together with the very fast (picosecond) dynamics of the return to the equilibrium spin configuration, is very interesting in terms of the potential development of ultrafast magnetic memories.